VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

An Autonomous Institution

Aziznagar Gate, C.B. Post, Hyderabad – 500075, Telangana, India.

B.Tech Syllabus (R-18)

Department of

Computer Science and Engineering

I YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits
A21002	Mathematics-I	3	1	0	4.0
A21003	Applied Physics	3	1	0	4.0
A21201	Basic Electrical Engineering	3	0	0	3.0
A21301	Engineering Graphics & Modeling	1	0	3	2.5
A21501	Programming For Problem Solving-I	2	0	0	2.0
A21082	Applied Physics Lab	0	0	3	1.5
A21281	Basic Electrical Engineering Lab	0	0	2	1.0
A21081	English Language Skills Lab (ELSL)	0	0	2	1.0
A21581	Programming For Problem Solving Lab-I	0	0	2	1.0
TOTAL CREDITS					**20**

I YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits
A22005	English	2	0	0	2.0
A22006	Mathematics-II	3	1	0	4.0
A22008	Chemistry	3	1	0	4.0
A22502	Programming For Problem Solving-II	2	0	0	2.0
A22084	English Communication Skills Lab (ECSL)	0	0	2	1.0
A22086	Chemistry Lab	0	0	3	1.5
A22382	Engineering Workshop	0	1	3	2.5
A22582	Programming For Problem Solving Lab-II	0	0	2	1.0
TOTAL CREDITS					**18**

Note: All End Examinations (Theory and Practical) are of three hours duration.

II YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits
A23012	Probability and Statistics	3	0	0	3
A23405	Digital Logic Design	3	0	0	3
A23401	Electronic Devices & Circuits	3	0	0	3
A23504	Data Structures	3	0	0	3
A23505	Mathematical Foundations of Computer Science	3	0	0	3
A23506	Python Programming	3	0	0	3
A23583	Data Structures & Python Programming Lab	0	0	2	2
A23483	Digital Logic Design and Electronic Devices & Circuits Lab	0	0	2	2
A23MC2	Gender Sensitization/Cyber Laws	2	0	0	--
Total number of Credits					**20**

II YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits
A24507	Design and Analysis of Algorithms	4	0	0	4
A24508	Computer Organization	3	0	0	3
A24509	Java Programming	3	0	0	3
A24510	Software Engineering	3	0	0	3
A24511	Database Management Systems	3	0	0	3
A24015	Professional Communications	2	0	0	2
A24584	Java Programming Lab	0	0	2	1
A24585	Database Management Systems lab	0	0	2	1
A24MC2	Environmental Science	2	0	0	-
Total number of Credits					**20**

COURSE STRUCTURE FOR B.TECH III YEAR

III Year 1st Semester

S. No.	Course Code	Category	Course Title	L	T	P	Credits
1	A25513	PC-9	Computer Networks	3	0	0	3
2	A25514	PC-10	Operating Systems	3	0	0	3
3	A25515	PC-11	Web Technologies	3	0	0	3
4	A25512	PC-12	Formal Languages and Automata Theory	3	0	0	3
5	A25516 A25517 A25518 A25520	PE-1	Human Computer Interaction Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	A25521 A25522 A25523	OE – 1	Basics of Operating Systems Core Java Programming Fundamentals of Computer Networks	3	0	0	3
7	A25586	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	A25587	PC Lab	Web Technologies Lab	0	0	2	1
9	A25TP2	Value added course -1	Personality Development & Behavioral Skills	2	0	0	1
Total number of Credits							**21**

III Year 2nd Semester

S. No.		Category	Course Title	L	T	P	Credits
1	A26017	H&S	Managerial Economics and Financial Analysis	3	0	0	3
2	A26524	PC-13	Compiler Design	3	0	0	3
3	A26525	PC-14	Data ware Housing & Data Mining	3	0	0	3
4	A26526	PC-15	Artificial Intelligence	3	0	0	3
5	A26527 A26528 A26529 A26530	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	A26531 A26532 A26533	OE-II	Database Management Systems Software Engineering Fundamentals Essentials of Python Programming	3	0	0	3
7	A26588	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	A26088	H & S	Advanced Communication Skills Lab	0	0	2	1
9	A26TP1 A26TP2	Value added course -1	Personality Development & Behavioral Skills Quantitative Methods & Logical Reasoning	2	0	0	1
Total number of Credits							**21**

III Year – I Semester
(Fast Track Curriculum Scheme)

S. No.	Course code	Course Title	L	T	P	Credits
1	A25512	Formal Languages and Automata Theory	3	0	0	3
2	A25513	Computer Networks	3	0	0	3
3	A25514	Operating Systems	3	0	0	3
4	A25515	Web Technologies	3	0	0	3
5	A25516 A25517 A25518 A25520	Human Computer Interaction Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	A25521 A25522 A25523	Basics of Operating Systems Core Java Programming Fundamentals of Computer Networks	3	0	0	3
7	A25586	Computer Networks & Operating Systems Lab	0	0	2	1
8	A25587	Web Technologies Lab	0	0	2	1
9	A25TP2	Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

III Year – II Semester
(Fast Track Curriculum Scheme)

S. No.	Course code	Course Title	L	T	P	Credits
1	A26017	Managerial Economics and Financial Analysis	3	0	0	3
2	A26524	Compiler Design	3	0	0	3
3	A26525	Data Warehousing & Data Mining	3	0	0	3
4	A26526	Artificial Intelligence	3	0	0	3
5	A26527 A26528 A26529 A26530	Object Oriented Analysis & Design Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	A26531 A26532 A26533	Database Management Systems Software Engineering Fundamentals Essentials of Python Programming	3	0	0	3
7	A26588	Data mining & Case Tools Lab	0	0	2	1
8	A26088	Advanced Communication Skills Lab	0	0	2	1
9	A26TP2 A26TP1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1

10	A28549	Semantic Web & Social Networks	3	0	0	3
Total			**23**	**0**	**4**	**24**

COURSE STRUCTURE FOR B.TECH IV YEAR

IV Year 1st Semester

S. No.	Course Code	Category	Course Title	L	T	P	Credits
1	A27534	PC-16	Mobile Application Development	3	0	0	3
2	A27535	PC-17	Cloud Computing	3	0	0	3
3	A27536 A27537 A27538 A27539	PE -3	Big Data Analytics Internet of Things R Programming Image Processing	3	0	0	3
4	A27540 A27541 A27542 A27543	PE-4	Advanced Databases Block-Chain Technologies Information Retrieval Systems Machine Learning	3	0	0	3
5	A27544 A27545 A27546	OE	Web Design Introduction to IOT Fundamentals of Cyber Security	3	0	0	3
6	A27590	PC Lab	Mobile Application Development Lab	0	0	2	1
7	A27591 A27592 A27593 A27594	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Image Processing Lab	0	0	2	1
8	A275P1	PW	Mini Project	0	0	0	3
Total number of Credits							**20**

IV Year IInd Semester

S. No.	Course Code	Category	Course Title	L	T	P	Credits
1	A28548	OE-2	E-Commerce	3	0	0	3
2	A28549	OE-3	Semantic Web and Social Networks	3	0	0	3
3	A285TS	PW	Technical Seminar	0	0	0	2
4	A285CV	PW	Comprehensive Viva Voce	0	0	0	2
5	A285P2	PW	Major Project	0	0	0	10
Total number of Credits							**20**

IV Year – I Semester
(Fast Track Curriculum Scheme)

S. No.	Category	Course Title	L	T	P	Credits
1	A27534	Mobile Application Development	3	0	0	3
2	A27535	Cloud Computing	3	0	0	3
3	A27536 A27537 A27538 A27539	Big Data Analytics Internet of Things R Programming Image Processing	3	0	0	3
4	A27540 A27541 A27542 A27543	Advanced Databases Block-Chain Technologies Information Retrieval Systems Machine Learning	3	0	0	3
5	A27544 A27545 A27546	Web Design Introduction to IOT Fundamentals of Cyber Security				
6	A27590	Mobile Application Development Lab	0	0	2	1
7	A27591 A27592 A27593 A27594	Big Data Analytics Lab Internet of Things Lab R Programming Lab Image Processing Lab	0	0	2	1
8	A275P1	Mini Project	0	0	6	3
9	A28548	E-Commerce	3	0	0	3
		Total	**21**	**0**	**10**	**23**

IV Year - II Semester
(Fast Track Curriculum Scheme)

S. No.	Category	Course Title	L	T	P	Credits
1	A285TS	Technical Seminar	0	0	4	2
2	A285CV	Comprehensive Viva Voce	0	0	4	2
3	A285P2	Major Project	0	0	20	10
		Total	**0**	**0**	**28**	**14**

Mathematics I
(Matrices and Calculus)

I Year I Semester

L	T	P	C
3	1	0	4

Course Outcomes:

1. Write the matrix representation of system of linear equations and identify the consistency of the system of equations.
2. Find the Eigen values and Eigen vectors of the matrix and discuss the nature of the quadratic form.
3. Analyze the convergence of sequence and series.
4. Discuss the applications of mean value theorems to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions.
5. Examine the extrema of functions of two variables with/ without constraints.

UNIT-I:

Matrices and Linear System of Equations:

Matrices and Linear system of equations: Real matrices – Symmetric, skew - symmetric, Orthogonal. Complex matrices: Hermitian, Skew – Hermitian and Unitary. Rank-Echelon form, Normal form. Solution of Linear Systems – Gauss Elimination, Gauss Jordan & LU Decomposition methods.

UNIT-II:

Eigen Values and Eigen Vectors:

Eigen values, Eigen vectors – properties, Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix- Quadratic forms: Reduction to Canonical form, Nature, Index, Signature.

UNIT-III:

Sequences & Series:

Basic definitions of Sequences and series, Convergence and divergence, Ratio test, Comparison test, Cauchy's root test, Raabe's test, Integral test, Absolute and conditional convergence.

UNIT-IV:

Beta & Gamma Functions and Mean Value Theorems:

Gamma and Beta Functions-Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions.

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Generalized Mean Value theorem (all theorems without proof) – Geometrical interpretation of Mean value theorems.

UNIT-V:

Functions of several variables:

Partial Differentiation and total differentiation, Functional dependence, Jacobian Determinant-Maxima and Minima of functions of two variables with constraints and without constraints, Method of Lagrange Multipliers.

Textbooks:

1. Higher Engineering Mathematics,B.S. Grewal, Khanna Publishers, 36th Edition, 2010
2. Advanced Engineering Mathematics by Jain &Iyengar Narosa Publications

Reference Books:

1. Calculus and Analytic geometry, G.B. Thomas and R.L. Finney, 9th Edition, Pearson, Reprint, 2002.
2. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley & Sons, 2006.
3. Advanced Engineering Mathematics (2nd Edition) Michael D. Greenberg

Applied Physics

L	T	P	C
3	1	0	4

I Yearl Semester

Course Outcomes:

1. Identify various optical phenomena of light.
2. Discuss the basic principles of quantum mechanics.
3. Classify solids based on the band theory.
4. Elucidate the characteristics of semiconductors and semiconductor devices.
5. Explain the working principle of lasers and optical fibers.

UNIT – I:

Wave Optics:

Principle of Superposition, coherence and methods to produce coherent sources, Interference - Interference in thin films by reflection, Newton's Rings.Diffraction – Fraunhofer and Fresnel Diffraction, Farunhofer diffraction due to single slit, Plane Diffraction Grating, resolving power of Grating.Polarization – Polarization of light waves, Plane of vibration, plane of polarization, Double refraction, Nicol's Prism, Applications of Polarization.

UNIT-II :

Introduction to Quantum Mechanics and free electron theory:

Classical free electron Theory, Electrical Conductivity and Ohm's Law – Drawbacks, Sommerfeld theory (Qualitative).Introduction to quantum physics: Black body radiation and Planck's Law(Qualitative), wave-particle duality, de-Broglie hypothesis of matter waves, Davisson and Germer experiment, Heisenberg uncertainty principle, time independent Schrodinger equation, Born interpretation of wave function, particle in an infinite potential well (one dimension).

UNIT-III:

Band theory of solids and semiconductors:

Kronig-Penny model(Qualitative), E-k diagram, Energy bands in solids, classification of materials into metals, semiconductors, and insulators, Effective mass, Density of States, Fermi distribution function, Fermi level and its importance. Intrinsic semiconductors, carrier concentration in intrinsic semiconductors, energy band diagram and position of Fermi level in intrinsic semiconductors, equation for electrical conductivity of semiconductors, extrinsic semiconductors.

UNIT-IV:

Semiconductor Devices:

Direct and indirect band-gap semiconductors, Formation of p-n junction, energy diagram of PN junction, I-V characteristics of PN junction diode, Photo diode, solar cell-efficiency, light emitting diode and their characteristics, semiconductor laser: device structure and characteristics, Hall effect and its applications.

UNIT-V:

Fiber Optics and Lasers:

Introduction, total internal reflection, acceptance angle and numerical aperture, losses associated with optical fibers, step and graded index fibers, applications of optical fibers.Introduction to interaction of radiation with matter: stimulated absorption, spontaneous emission and stimulated emission, Einstein's coefficients and their relations, characteristics of a laser, important components of a laser: active medium, pumping source, optical resonator. population inversion, Ruby laser, He-Ne laser, applications of lasers.

Textbooks:

1. Engineering Physics, P K Palanisamy, Scietech publication.
2. Engineering Physics, V Rajendran, McGraw Hill Education.

Reference Books:

1. Engineering Physics, S O Pillai, Sivakami, New Age International (P) Limited.
2. Physics Volume I & II, Resnick and Halliday, John Wiley and sons, Inc.

Applied Physics Lab

I Yearl Semester

L	T	P	C
0	0	3	1.5

Course Outcomes:

1. Apply optical phenomena to characterize optical sources and components.
2. Determine the energy gap of a semiconductor diode and time constant of RC circuit
3. Describe the electrical characteristics of PN junction diode, photodiode, LED and solar cell.
4. Demonstrate the resonance in mechanical and electrical waves.
5. Identify the magnetic Induction along the axis of current carrying coil.

List of Experiments

1. Newton's rings: Determination of the radius of curvature of the lens by forming Newton's rings.
2. Diffraction grating: To determine the number of lines per inch of the grating.
3. Dispersive power: To determine the dispersive power of prism by using spectrometer.
4. Single Slit Diffraction using Lasers- Determination of wavelength of a Monochromatic Source (LASER).
5. Energy gap of P-N junction diode: Determination of the energy gap of a semiconductor diode.
6. Photo diode: Study the V-I Characteristics of Photo diode.
7. Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.
8. Solar cell: Study the V-I Characteristics of Solar cell.
9. Stewart & Gee's experiment - Determination of magnetic Induction along the axis of current carrying coil.
10. LCR Circuit- Determination of the Resonance frequency of forced electrical oscillator.
11. RC- Circuit – Determination of the time constant of RC-circuit.
12. Optical fiber: Determination of the Numerical aperture of Optical fiber.

Note: Any 10 experiments are to be performed.

Basic Electrical Engineering

L	T	P	C
3	0	0	3

I Year I Semester

Course Outcomes:

1. Understand the fundamentals of basic circuit components and their characteristics.
2. Analyze basic electrical circuits with A.C excitation.
3. Understand the concepts of magnetic circuits and transformers.
4. Acquire the basic concepts of electrical motors.
5. Understand the concept of A.C generator and low voltage electrical installations.

UNIT- I:

Introduction to Electrical Engineering and DC Circuits:

Basic definitions, types of elements, types of sources, Kirchhoff's Laws, resistive networks, inductive networks, series, parallel circuits, Star- Delta and Delta- Star transformation, Network theorems- Superposition, Thevenin's - simple problems.

UNIT- II:

AC Circuits:

Representation of sinusoidal waveforms, peak, RMS and average values **-** Elementary treatment of single-phase AC circuits consisting of R, R-L, R-C, R-L-C combinations (series and parallel) **-** Phase representation, real power, reactive power, apparent power, resonance concept. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT -III:

Magnetic Circuits &Transformers:

Magnetic circuits: Magnetic materials, Faraday's laws of Electromagnetic Induction, BH characteristics, Magnetic Circuits - concept of Self & Mutual Inductance.

Transformers: Ideal and practical single phase transformer, OC-SC tests, equivalent circuit, losses in transformer, regulation and efficiency - simple problems.

UNTI -IV:

DC Machines and Induction Motors:

DC Machines: Construction, Principle and Operation of DC Motor, Voltage- torque equations - simple problems.

Three Phase Induction Motor: Construction, Principle and working of three phase Induction Motor, torque slip characteristics, - simple problems.

Single Phase Induction Motor: Single phase Induction Motor construction and working principle, capacitor start – applications.

UNIT -V:

Ac Generator & Electrical Installation:

AC Generator: Construction, Principle of operation of Synchronous Generator, Pitch Factor- Distribution Factor (or winding factor) - EMF equation – simple problems.
Electrical Installation: Fuse, Circuit breakers, difference between fuse and circuit breaker, Types of Batteries, battery backup.

Textbooks:

1. Basic Electrical Engineering, D.P Kothari & I.J Nagrath, Tata McGraw Hill Publishing Company Limited-2nd Edition.
2. Basic Electrical Engineering, T.K. Nagsarkar and M.S. Sukhija, Oxford University Press-3rd Edition.

Reference Books:

1. Circuits and Networks, A.Sudhakar&ShyamMohan.S, Tata McGraw Hill Publishing Company limited, 5th Edition.
2. Basic Electrical Engineering, K.Uma Rao and A.Jayalakshmi, Pearson Publications.
3. Basic Electrical Engineering by D C Kulshreshtha, McGraw Hill Education Private limited, 1st Edition.

Basic Electrical Engineering Lab

L	T	P	C
0	0	2	1

I Year I Semester

Course Outcomes:

1. Get an exposure to basic electrical laws.
2. Understand the response of different types of electrical circuits to different excitations.
3. Understand the measurement, calculation and relation between the basic electrical parameters.
4. Understand the performance characteristics of D.C electrical machines.
5. Understand the performance characteristics of A.C electrical machines.

List of experiments/ demonstrations:

Any 5 experiments from Part-A and Part-B should be conducted (Total 10 Experiments)

Part A

1. Verification of Ohms law.
2. Verification of KVL and KCL.
3. Verification of Thevenin's Theorem.
4. Verification of Superposition Theorem.
5. Transient Response of Series R- L and R - C circuits using DC excitation.
6. Determination and Verification of Impedance and Current of RL and RC series circuits.

Part B

1. Transient Response of R-L-C Series circuit using DC excitation.
2. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation).
3. OC & SC Test on Single phase transformer.
4. Brake test on DC shunt motor.
5. Brake test on Three Phase Squirrel cage induction motor.
6. OCC of Three phase alternator.

Reference Books:

1. Circuits and Networks by A. Sudhakar &ShyamMohan.S, Tata McGraw Hill Publishing Company Limited, 5th Edition.
2. Basic Electrical Engineering - by T.K. Nagsarkar and M.S. Sukhija, Oxford University Press, 3rd Edition.
3. Basic Electrical Engineering by D.P Kothari & I.J Nagrath, Tata McGraw Hill Publishing Company Limited, 2nd Edition.

Engineering Workshop

I Year I Semester

L	T	P	C
0	1	3	2.5

Course Outcomes:

1. Understanding the tools and methods of using to fabricate engineering components
2. Applying the measuring techniques to verify the dimensional accuracy
3. Evaluating various methods and trades of workshop in the component building

(i) Lectures & videos:

Detailed contents:

1. Manufacturing Methods- Metal Forming, Machining, Advanced manufacturing methods (2 lectures)
2. CNC machining, Additive manufacturing (2 lectures)
3. Fitting operations & power tools (1 lecture)
4. House wiring (1 lecture)
5. Carpentry (1 lecture)
6. Plastic moulding(1 lecture)
7. Metal casting (1 lecture)
8. Welding (1 Lecture)

(ii) Workshop Practice:

Detailed contents:

1. Machine shop (Lathe machine)
2. Fitting shop
3. Carpentry
4. House Wiring
5. Welding shop (Arc welding)
6. Tin Smithy

Reference Books:

1. Elements of Workshop Technology, Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Manufacturing Engineering and Technology, Kalpakjian S. And Steven S. Schmid, 4th edition, Pearson Education India Edition, 2002.

English Language Skills Lab

I Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

1. Reproduce speech sounds and improve fluency in language.
2. Understand syllables and consonant clusters for appropriate pronunciation.
3. Exhibit effective professional skills with rhetoric eloquence.
4. Deliver enthusiastic and well-practiced presentation.
5. Learn Task-Based Language Learning (TBLL) through various language learning activities effectively.

Exercise- I:

CALL Lab:

Introduction to Pronunciation- Speech Sounds, Vowels and Consonants- Practice for Listening .

ICS Lab:

Ice-Breaking activity and JAM session.

Exercise-II:

CALL Lab:

Silent Letters, Consonant Clusters, Homographs.

ICS Lab:

Common Everyday Situations: Conversations and Dialogues.

Exercise-III:

CALL Lab:

Syllables.

ICS Lab:

Communication at Workplace, Social and Professional Etiquette.

Exercise-IV:

CALL Lab:

Word Accent and Stress Shifts.

ICS Lab:

Formal Presentations, Visual Aids in Presentations.

Exercise-V:

CALL Lab:

Intonation, Situational dialogues for practice.

ICS Lab:

Interviews, Types of Interviews.

Reference Books:

1. A textbook of English Phonetics for Indian Students, T. Balasubramanian, Macmillan Publishers,2010.
2. Speaking English Effectively, Mohan, Macmillan Publishers, 2010.

Programming for Problem Solving-I

I Year I Semester

L	T	P	C
2	0	0	2

Course Outcomes:

1. Design Algorithms and Flowcharts for real world applications using 'C'.
2. Know the usage of various operators in Program development.
3. Design programs involving decision and iteration structures.
4. Apply the concepts code reusability using Functions.
5. Analyze various searching and sorting techniques using Arrays.

UNIT-I:

Problem Solving Using Computers: Introduction, Algorithms, Flowcharts and Pseudo code, Applications of C language.

Overview of C Language: Introduction, Salient Features of C Language, Structure of a "C" Program.

C Language Preliminaries: Keywords and Identifiers, Constants, Variables, Data Types, and Input / Output Statements with suitable illustrative "C" Programs.

UNIT-II:

Operators: Assignment Operators, Relational and Logical Operators, Increment and Decrement Operators, Bitwise Operators, Ternary Operator, Type Conversion, Precedence and Associativity with suitable illustrative "C" Programs.

UNIT-III:

Statements in C:

Conditional/Decision Statements: if, if-else, Nested if-else, else-if ladder, and Switch-Statement with suitable illustrative "C" Programs.

Loop Control Statements: while, do-while and for with suitable illustrative "C" Programs.

UNIT-IV:

Functions: Introduction to Functions, benefits of functions, types of functions, Function calls, return vs exit( ), Parameter Passing mechanism: Call-by-Value, Recursion, Storage Classes.

UNIT-V:

Arrays: Introduction to Arrays, One-Dimensional Arrays, Two-Dimensional Arrays, Arrays and Functions.

Searching and Sorting: Linear Search, Binary Search, Bubble Sort, Insertion Sort.

Textbooks:

1. Computer Science: A Structured Programming Approach Using C, B.A. Forouzon and R.F. Gilbert Third edition, CENGAGE Learning, 2016.
2. C and Data Structures,Ashok N. Kamthane, Pearson Education. 2010.

Reference Books:

1. Problem Solving Using C, M.T. Somashekara,PHI, 2nd Edition 2009.

2. Computer Fundamentals and Programming in C,A.K.Sharma,2nd Edition, University Press.
3. Programming in C 2/e, Pradip Dey and Manas Ghosh,Oxford University Press, 2nd Edition 2011
4.The Fundamentals of Computers, Rajaraman V,4th Edition, Prentice Hall of India,2006
5. Programming in C,R S Bichker, University Press, 2012.

Programming for Problem Solving Lab – I

I Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

1. Apply the specification of syntax rules for numerical constants and variables, data types.
2. Know the Usage of various operators and other C constructs.
3. Design programs on decision and control constructs.
4. Develop programs on code reusability using functions.
5. Implement various searching and sorting techniques using arrays.

Week 1

Ubuntu and Linux Commands.

Week 2

Designing of flowcharts and algorithms using raptor tool.

1. Areas of Polygons.
2. Calculation of Simple and Compound Interest.
3. Swapping of Two numbers with and without temporary variable.
4. Checking whether a number is even or odd.
5. Sum of first 'n' natural numbers.
6. Checking a number whether it is divisible by any given number.
7. Evaluation of mathematical expressions.
8. Programs using scanf( ) and printf( ) statements.

Week 3

Programs on operators. (Minimum 4 Programs)

Week 4, 5 & 6

Programs on Conditional Statements. (Minimum 12 Programs)

Week 7,8 & 9

Programs on Control Statements. (Minimum 12 Programs)

Week 10 &11

Programs on Functions. (Minimum 6 Programs)

Week 12

Programs on One Dimensional Arrays. (Minimum 3 Programs)

Week 13

Programs on Two Dimensional Arrays. (Minimum 2 Programs)

Week 14

Implementation of Linear Search and Binary Search.

Week 15
Implementation of Bubble Sort and Insertion Sort.

Week 16
Review

Mathematics II
(Ordinary Differential Equations and Vector Calculus)

I YearII Semester

L	T	P	C
3	1	0	4

Course Outcomes:

1. Classify the various types of differential equations of first order and first degree and apply the concepts of differential equations to the real-world problems.
2. Solve higher order differential equations and apply the concepts of differential equations to the real-world problems.
3. Find the Laplace Transform of various functions and apply to find the solutions of differential equations.
4. Evaluate the multiple integrals and identify the vector differential operators physically in engineering problems.
5. Evaluate the line, surface and volume integrals and converting them from one to another by using vector integral theorems.

UNIT-I:

First order Ordinary Differential Equations and their Applications:

Formation of Differential equations, Differential equations of first order and first degree: exact, linear and Bernoulli, Applications of ODE: Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT-II:

Higher Order Linear Differential Equations:

Linear differential equations of second and higher order with constant coefficients, RHS term of the type f(X) $= e^{ax}, \sin ax, \cos ax \; and \; x^k, e^{ax}V(x), x^kV(x)$. Method of variation of parameters

UNIT-III:

Laplace transforms:

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms – Application of Laplace transforms to ordinary differential equations.

UNIT-IV:

Multiple Integrals & Vector Differentiation:

Multiple integrals - double and triple integrals – change of order of integration (Only Cartesian form)- change of variables (Cartesian to Polar for double integral, Cartesian to Spherical for triple integral). Gradient- Divergence- Curl and their related properties - Potential function - Laplacian and second order operators.

UNIT-V:

Vector Integration:

Line integral, work done, Surface and Volume integrals. Vector integrals theorems: Green's, Stoke's and Gauss Divergence Theorems (Only Statements & their Verifications).

Textbooks:

1. Higher Engineering Mathematics,B.S. Grewal, Khanna Publishers, 36th Edition, 2010
2. Advanced Engineering Mathematics by Jain &Iyengar Narosa Publications.

Reference Books:

1. Calculus and Analytic geometry,G.B. Thomas and R.L. Finney, 9th Edition, Pearson, Reprint, 2002.
2. Advanced Engineering Mathematics,Erwin Kreyszig, 9th Edition, John Wiley & Sons, 2006.
3. Advanced Engineering Mathematics (2nd Edition) Michael D. Greenberg

Chemistry

I Year II Semester

L	T	P	C
3	1	0	4

Course Outcomes:

1. Acquire knowledge of atomic, molecular and electronic changes related to conductivity.
2. Apply the various processes of treatment of water for both domestic and industrial purpose.
3. Apply the knowledge of electrode potentials for the protection of metals from corrosion.
4. Analyze the major chemical reactions that are used in the synthesis of compounds.
5. Apply the knowledge of polymers in every day's life.

UNIT- I:

Atomic and molecular structure:

Introduction, Concept of atomic and molecular orbitals, LCAO, Molecular orbitals of di-atomicmolecules, Molecular orbital energy level diagrams of diatomic molecules (N_2, O2 & F_2). Pi-molecular orbitals of butadiene and benzene.

Crystal field theory (CFT): Crystal field theory, Crystal field splitting patterns of transition metal ion d- orbital- tetrahedral, octahedral and square planar geometries.

UNIT- II:

Water Technology:

Hardness of water, expression of hardness ($CaCO_3$ equivalent), units and types of hardness. Estimation of temporary and permanent hardness of water by EDTA method. Numerical problems based on hardness of water. Potable water: characteristics, treatment of water for domestic supply. Desalination of brackish water: reverse osmosis. Alkalinity of water and its determination. Boiler feed water and its treatment: Internal treatment (colloidal, phosphate calgon conditioning of water). External treatment (ion –exchange process).

UNIT- III:

Electrochemistry and corrosion:

Electrode, electrode potential, galvanic cell, cell reactions and cell notation, cell EMF, types of electrodes (Calomel electrode and Quinhydrone electrode) , Determination of P^H using quinhydrone electrode. Nernst equation, Numerical problems.

Batteries: Introduction to cell and battery, Primary (lithium cell) and secondary cells, (lead-Acid cell, and Lithium ion cells). Fuel cells – Hydrogen – Oxygen fuel cell, advantages and engineering applications of fuel cells.

Corrosion: Introduction, types of corrosion: chemical and electrochemical corrosion, factors affecting the rate of corrosion: nature of the metal, position of metal in galvanic series, purity of metal, nature of corrosion product , nature of environment : effect of temperature, effect of

pH, humidity. Corrosion control methods: Cathodic protection: sacrificial anode method and impressed current cathode method. Protectivecoatings: metallic coatings (anodic and cathodic), methods of application on metals, electroplating (of copper), electroless plating (of Ni) , organic coatings- paints.

UNIT-IV:

Stereochemistry:

Structural isomers and stereoisomers, configurations, symmetry and chirality, enantiomers, diastereomers, optical activity. Conformations of cyclic (cyclohexane) and acyclic systems (Ethane).

Organic reactions and synthesis of a drug molecule:

Introduction to reactions involving substitution (SN1 & SN2), addition(addition of HBr to propene, Markownikoff and Anti Markownikoff addition), elimination, oxidation(oxidation of alcoholsusing $KMnO_4$& CrO_3), reduction(reduction of carbonyl compounds by $LiAlH_4$& $NaBH_4$). Synthesis of a commonly used drug molecule- paracetamol and Asprin.

UNIT-V:

Polymer Chemistry:

Introduction, classification of polymers, types of polymerization (addition and condensation, mechanisms not included). Plastics- types of plastics -thermoplastics and thermosetting plastics. Preparation, properties and engineering applications of PVC, Teflon and Bakelite. Fibers: Nylon 6, 6 and Terelene (Dacron). Elastomers: natural rubber, structure, vulcanization. Synthetic rubbers: Buna-S, Butyl rubber &Thikol rubber. Conducting polymers: classification and applications.

Biodegradable polymers:Types, examples: Polyhydroxy butyrate (PHB) ,Poly-Hydroxybutyrate-co-b-Hydroxy valerate (PHBV) ,Polyglycolic acid (PGA) , Polylactic acid (PLA) ,Poly (Î-caprolactone) (PCL). Applications of biodegradable polymers.

Textbooks:

1. Engineering Chemistry, P.C Jain & Monica Jain, Dhanpat Rai Publications,2017.
2. Engineering Chemistry,Bharathi Kumari. Y, VGS Publications,2018.

Reference Books:

1. March's Advanced Organic Chemistry, Smith,Wiley publications,2017.
2. Engineering Chemistry, Shiva Sankar, TMH Publications , 2010.

Chemistry Lab

I Year II Semester

L	T	P	C
0	0	3	1.5

Course Outcomes:

1. Determination of parameters like hardness, alkalinity and chloride content in water.
2. Estimation of rate constant of a reaction from concentration-time relationships.
3. Determination of physical properties like adsorption, surface tension and viscosity.
4. Synthesize a small drug molecule and analyze a salt sample.
5. Calculation of strength of compound using instrumentation techniques.

Choice of 10-12 experiments from the following:

1. Estimation of total hardness of water by EDTA method.
2. Determination of alkalinity of water.
3. Determination of chloride content of water.
4. Estimation of HCl by conductometric titration.
5. Estimation of mixture of acids by conductometric titration.
6. Estimation of HCl by potentiometric titration.
7. Estimation of Fe^{2+} by potentiometry using $KMnO_4$.
8. Determination of the rate constant of a reaction.
9. Determination of surface tension.
10. Determination of viscosity of a lubricant.
11. Chemical analysis of a salt.
12. Synthesis of a polymer/drug.
13. Adsorption of acetic acid by charcoal.
14. Determination of Saponification /acid value of an oil.

Reference Books:

1. Practical Engineering Chemistry by Mukkanti, B.S. Publications, 2010.
. 2. Volga's Qualitative Inorganic Chemistry by PEAR Publications 2010.

English

I Year II Semester

L	T	P	C
2	0	0	2

Course Outcomes:

1. Infer the importance of scientific discoveries in promoting social responsibilities.
2. Comprehend the given texts and respond appropriately for technical and professional purposes.
3. Communicate confidently and transfer information into various forms of writing.
4. Understand the importance of health and nutrition for a better society.
5. Present various forms of business writing skills for successful careers.

UNIT-I:

'The Raman Effect' from the prescribed textbook **'English for Engineers'**

Grammar : Articles & Prepositions

Reading : Reading and Its Importance- Techniques for Effective Reading.

Writing : Organizing principles of paragraphs in documents.

Vocabulary: The concept of word Formation, synonyms, antonyms, and standard abbreviations.

UNIT-II:

'Ancient Architecture in India' from the prescribed textbook **'English for Engineers'**

Reading : Improving Comprehension Skills – Techniques for good comprehension

Writing : Sentence Structures, Use of phrases and clauses in sentences

Writing Formal Letters-Eg. Letter of Complaint, Letter of Requisition,

Job Application with Resume.

Vocabulary: Root words and acquaintance with prefixes and suffixes from foreign languages in English, to form derivatives

UNIT-III:

'Blue Jeans' from the prescribed textbook **'English for Engineers'**

Grammar: Tenses: Types and uses.

Reading : Sub-skills of Reading- Skimming and Scanning

Writing :Identifying Common Errors in Writing

Subject-Verb agreement in number, gender and person

Information Transfer-Process writing

UNIT-IV:

'What Should You Be Eating' from the prescribed textbook **'English for Engineers'**

Reading : Intensive Reading and Extensive Reading

Writing : Nature and Style of Sensible Writing

Describing & Defining
Identifying common errors in writing

UNIT-V:

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook **'English for Engineers'**

Vocabulary : Technical Vocabulary and their usage
Reading : Reading Comprehension-Exercises for Practice
Writing : Cohesive Devices
Précis Writing
Technical Reports-Introduction, Characteristics of a Report – Categories of Reports, Formats- Structure of Reports (Manuscript Format) –Types of Reports - Writing a Report.

Textbooks:

1. English for Engineers,Sudarshana, N.P. and Savitha, C Cambridge University Press, 2018.

Reference Books:

1. Effective Technical communication, Muhammed Rizvi, TMH, 2008.
2. Advanced English Grammar, Hewings, Cambridge University Press, 2010.

English Communication Skills Lab

L	T	P	C
0	0	2	1

I Year II Semester

Course Outcomes:

1. Understand the variants in pronunciation.
2. Identify the diverse purposes of listening and speaking.
3. Discuss ideas in diverse communicative settings.
4. Exhibit increased confidence in public speaking.
5. Display critical thinking, problem solving and decision making skills through GD's

Exercise-I:

CALL Lab:

Common Indian Variants in Pronunciation – Differences between British and American Pronunciation.

ICS Lab:

Spoken vs. Written language-Formal and Informal English- Introducing Oneself and Others.

Exercise-II:

CALL Lab:

Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening.

ICS Lab:

Features of Good Conversation – Strategies for Effective Communication Role-Play- Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise-III:

CALL Lab:

Information Transfer.

ICS Lab:

Descriptions-Narrations-Giving Directions and Guidelines-Giving Instructions-Seeking Clarifications-Asking for and Giving Directions-Thanking and Responding-Agreeing and Disagreeing-Seeking and Giving Advice-Making Suggestions.

Exercise-IV:

CALL Lab:

Past Tense Marker and Plural Marker.

ICS Lab:

Public Speaking- Exposure to Structured Talks - Non-verbal Communication- Making a Short Speech – Extempore.

Exercise-V:

CALL Lab:

Intonation- Sentence Stress -Weak Forms and Strong Forms.

ICS Lab:

Group Discussion, Mock Group Discussion sessions

Reference Books:

1. A textbook of English Phonetics for Indian Students, T. Balasubramanian, Macmillan Publishers,2010.
2. Speaking English Effectively, Mohan, Macmillan Publishers, 2010.

Programming for Problem Solving-II

L	T	P	C
2	0	0	2

I Year II Semester

Course Outcomes:

1. Identify various string handling functions in 'C'.
2. Develop programs with user defined data types.
3. Use Dynamic memory allocation functions with pointers.
4. Distinguish between Stacks and Queues.
5. Analyze various Dynamic Data Structures.

UNIT – I:

Overview of Arrays and Functions.

Strings: Introduction to Strings, String I/O, String Operations with and without built-in functions (strlen( ), strcmp( ), strcat( ),strcpy( ) and strrev( )).

UNIT -II:

Structures: Definition and Initialization of Structures, Accessing structure members, Nested Structures, Array of Structures, Structures and Functions, Unions, typedef, Enumerated Data types.

UNIT-III:

Pointers: Introduction to Pointers, Pointer Arithmetic, Pointers and Arrays, Pointer to Structure, Pointers and Strings, Parameter passing mechanism: Call by Reference, Pointer to Pointer, Dynamic Memory Allocation.

UNIT-IV:

Introduction to Data Structures: Lists and Operations, Linear and Non linear Data structures.

Stacks- Introduction to Stacks, Operations, Implementation of Stack using Arrays.

Queues- Introduction to Queues, Operations, Implementation of Queue using Arrays.

UNIT-V:

Linked Lists: Introduction to Linked List, Operations on Single Linked List(search, Insertion & Deletion).

Files: Introduction to Files, File Operations (Open, Close, read & Write).

Textbooks:

1. COMPUTER SCIENCE: A Structured Programming Approach Using C, B.A.Forouzon and R.F. Gilberg, Third edition, 2016.
2. C and Data Structures,Ashok N. Kamthane, Pearson Education.

Reference Books:

1. Problem Solving Using C,M.T. Somashekara, PHI, 2nd Edition 2009.

2. Computer Fundamentals and Programming in C,A.K.Sharma, 2nd Edition, University Press .
3. Programming in C 2/e,PradipDey and Manas Ghosh, Oxford University Press, 2nd Edition 2011.
4. The Fundamentals of Computers,Rajaraman V., 4th Edition, Prentice Hall of India, 2006.
5. Programming in C,R S Bichker, University Press, 2012.

Programming for Problem Solving Lab – II

L	T	P	C
0	0	2	1

I Year II Semester

Course Outcomes:

1. Build programs on various string handling functions.
2. Develop applications on user defined data types.
3. Apply dynamic memory allocation through pointers.
4. Implement linear data structures through stacks and queues.
5. Create linked list dynamically through stacks and queues.

Week 1:
Programs on Arrays and Functions. (Minimum 3 Programs)

Week 2 & 3:
Programs on Strings with and without string built-in Functions. (Minimum 6 Programs)

Week 4:
Programs on Accessing Structures and Nested Structures. (Minimum 3 Programs)

Week 5 &6 :
Programs on Array of Structures, Structures and Functions. (Minimum 5 Programs)

Week 7:
Programs on Unions, typedef and enum. (Minimum 4 Programs)

Week 8:
Programs on Pointers, pointer arithmetic, pointer expression, One Dimensional and Two dimensional arrays. (Minimum 4 Programs)

Week 9:
Programs on Pointer to structure, Call by Reference, Pointer to Pointer. (Minimum 3 Programs)

Week 10:
Programs on Dynamic Memory Allocation Functions. (Minimum 3 Programs)

Week 11:
Programs on Stacks and Queues using Arrays.

Week 12 & 13:
Programs on Single Linked List.

Week 14 &15 :
Programs on File Operations. (Minimum 6 Programs)

Week 16:
Review.

Engineering Graphics & Modeling

I Year II Semester

L	T	P	C
1	0	3	2.5

Course Outcomes:

1. Understand the concepts of engineering drawing of planes, solids and the CAD drawing software.
2. Applying the principles of engineering graphics while drawing the engineering components.
3. Analyze the sectional views for their configurations.
4. Evaluate the surfaces of solids developed for further processing in the engineering applications.

UNIT- I:

Introduction to Engineering Drawing: Principles of engineering graphics and their significance, usage of drawing instruments, conic sections, including the rectangular hyperbola– general method only. Cycloid, Epicycloid, Hypocycloid. Scales – plain & diagonal only.

Introduction to CAD: Introduction to CAD software and its importance, standard toolbar/menus and navigation tools used in the software, using basic commands limits ,units, grid, test , move, offset ,mirror, rotate, trim, extend, fillet etc. drawing lines using line command. Drawing spline, ellipse, circle, rectangle etc.. Concept of layers and dimensioning.

UNIT- II:

Principles of Orthographic Projections: Conventions. Projections of points, projections of lines (first angle projection) inclined to both planes (traces and midpoint problem to be excluded).

Implementation of CAD: Drawing orthographic projections of points and lines using a CAD package.

UNIT – III:

Projections of the Planes: Projections of regular planes inclined to both the planes.

Projections of Solids: Projections of regular solids inclined to both the planes (prisms, pyramids, cones and cylinders, Change of potion method only).

Implementation in CAD: Drawing orthographic projection of planes and regular solids using a CAD package.

UNIT- IV:

Sections and Sectional Views of Right Angular Solids: Prism, Cylinder, Pyramid, Cone. Development of surfacesof right regular solids - Prism, Pyramid, Cylinder and Cone.

Implementation in CAD: Concept of hatching, drawing sectional views of solids and the development of right regular solids using a CAD package.

UNIT-V:

Principles of Isometric projection: Isometric scale, isometric views, conventions, isometric views of lines, planes, simple solids, conversion of isometric views to orthographic views and vice-versa, conventions.

Implementation in CAD: Drawing isometric views of simple solids. Drawing isometric views from giving orthographic views and vice-versa using a CAD package.

Note: Implementation in CAD (For Internal Evaluation Weightage Only)

Textbooks:

1. Engineering Drawing, Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Charotar Publishing House.

Reference Books:

1. Engineering Graphics, Agrawal B. & Agrawal C. M. (2012),TMH Publication
2. Text book on Engineering Drawing,Narayana, K.L. & P Kannaiah (2008)Scitech Publishers.
3. Engineering Drawing and Computer Graphics,Shah, M.B. & Rana B.C. (2008), Pearson Education.
4. http://docs.autodesk.com/ACDMAC/2013/ENU/PDFs/acdmac_2013_users_guide.pdf

COURSE STRUCTURE FOR B.TECH II YEAR

B. Tech. II Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	BS	Probability and Statistics	3	0	0	3
2	ES	Digital Logic Design	3	0	0	3
3	ES	Electronic Devices Circuits	3	0	0	3
4	PC-1	Data Structures	3	0	0	3
5	PC-2	Mathematical Foundations of Computer Science	3	0	0	3
6	PC-3	Python Programming	3	0	0	3
7	PC Lab	Data Structures & Python Programming lab	0	0	2	1
8	ES Lab	Digital Logic Design & Electronic Devices Circuits Lab	0	0	2	1
9	MC-1	Environmental Science/ Gender Sensitization/ Cyber Laws	2	0	0	0
		Total	**20**	**0**	**4**	**20**

B. Tech. II Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-4	Design & Analysis of Algorithms	3	1	0	4
2	PC-5	Computer Organization	3	0	0	3
3	PC-6	Java Programming	3	0	0	3
4.	PC-7	Software Engineering	3	0	0	3
5	PC-8	Database Management Systems	3	0	0	3
6	H&S	Professional Communication	1	0	2	2
7	PC Lab	Java Programming Lab	0	0	2	1
8	PC Lab	Database Management Systems Lab	0	0	2	1
9	MC-2	Environmental Science/ Gender Sensitization/ Cyber Laws	2	0	0	0
Total			**21**	**0**	**6**	**20**

PROBABILITY AND STATISTICS

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

After learning the contents of this course the students must be able to:

1. To differentiate among random variables involved in the probability models which are useful for all branches of engineering.
2. Derive relationship among variety of performance measures using probability distributions.
3. Acquire elementary knowledge of parametric and non parametric –tests and understand the use of observing state analysis for predicting future conditions.
4. Identify and examine situations that generate using problems and able to solve the tests of ANOVA for classified data.
5. Apply proper measurements, Indicators and techniques of Correlation and regression analysis.

UNIT-I:

Probability and Random Variables:

Introduction to Probability, Random variables- Discrete and Continuous, Expectation, Probability Distribution Function, Mass Function/ Density Function of a Probability Distribution.

UNIT-II:

Probability Distributions:

Fitting of Binomial, Poisson & Normal distributions and their properties (only Statements) Moment Generating Functions of the above three distributions and hence finding the mean and variance.

UNIT-III:

Sampling Theory & Testing of Hypothesis I:

Sampling Distribution-Definition of Sample, Population, and Types of Sampling. Estimation-Point estimation, Interval estimation, Testing of Hypothesis- Null hypothesis – Alternative hypothesis, Type I, & Type II errors – critical region confidence interval for mean, Testing of hypothesis for single mean and difference between the means for large samples.
Confidence interval for the proportions, Tests of hypothesis for the proportions- single and difference between the proportions for large samples.

UNIT-IV:

Testing of Hypothesis II:

Small Samples - t-distribution, F-Distribution, χ^2 distribution, ANOVA for one-way classified data.

UNIT-V:

Correlation, Regression & Curve Fitting:

Coefficient of Correlation-Regression coefficients- The lines of Regression the Coefficient of Rank Correlation.

Curve Fitting- Fitting a Straight line- Second Degree Polynomial- Exponential, Power Curve by Method of Least Squares.

Text Books:

1. Probability and Statistics for Engineers, by Richard Arnold Johnson, Irvin Miller and John E Freund,
   New Delhi Prentice Hall.
2. Introduction to Probability & Statistics for Engineers and Scientists by Sheldon M.Ross

References Books:

1. An Introduction to Probability and Statistics, 2ed by Vijay K. Rohatgi, A.K. Md. Ehsanes Saleh, Weley.
2. Probability & Statistics for Engineers & Scientists, Walpole, Myers.et.al, Prentice Hall.
3. Fundamentals of probability and statistics for engineers, T T Soong, Weley.

DIGITAL LOGIC DESIGN

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to

1. Understand various number systems, conversions, range and error detecting and correcting codes and their significance.
2. Evaluate the minimization of logic gates using Boolean algebraic principles and k-maps.
3. Design various simple and complex combinational circuits with real time applications.
4. Analyze the basic principles behind Flip flops & the design of sequential circuits with real time applications.
5. Illustrate various types of memory devices and their design.

UNIT -- I:

Number Systems: Binary, Octal, Hex Decimal, and Conversions, range; Binary additions and subtractions (using 1c, and 2c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; BCD numbers: Representation of 8421, 2421, Ex-3, Gray and self complementary codes; additions and subtractions on 8421 codes; Error detecting **codes:** even, odd parity, hamming codes; Error correcting codes: hamming codes, block parity codes; Floating point representation.

UNIT --II:

Boolean Algebra and Digital Logic GATES, Basic Boolean laws and properties; Boolean functions; canonical and standard forms (SOP, POS); Gate minimization using three and four variable K-Map's with and without don't cares. Encoders, Decoders, Multiplexers, D-Multiplexers;

UNIT -- III:

Definition of combinational circuits, design procedure for half, full, decimal (8421) adders and subtractors; Combinational Circuit Design for BCD code converters;

UNIT -- IV:

Sequential circuits, latches, Flip Flops; Analysis of clocked sequential circuits, State Reduction and Assignment, Register, Ripple Counters, Synchronous Counters, Other Counters.

UNIT -- V:

Types of Memory – Main memory – random access memory, ROM, Types of ROM; Decoder and RAM interface: Address lines, data lines, chip select signal; Design of large memories using small memories, using decoders; problems in memory design; Cache Memory- design issues, hit and miss ratio related problems; Associative and Auxiliary memory;

TEXT BOOKS:

1. M. Morris Mano, Digital Design, Third Edition, Pearson Education/PHI, 2001.
2. Roth, Fundamentals of Logic Design, Fifth Edition, Thomson, 2004

REFERENCE BOOKS:

1. John F. Wakerly, Digital Design: Principles and Practices, 4th Edition, Pearson/Prentice Hall, 2005.
2. Malvino& Leach, Digital Principles and Applications, Seventh Edition, Tata McGraw-Hill Edu., 2010.
3. A.K. Maini, Digital Electronics, Principles and Integrated Circuits, 1stEdition, Wiley India Publ., 2007.

ELECTRONIC DEVICES AND CIRCUITS

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to

1. Demonstrate the concepts of semiconductor theory.
2. Interpret the characteristics of different semiconductor devices with its applications.
3. Apply different biasing techniques of transistors for amplification.
4. Analyze transistor amplifiers using small signal model.
5. Ability to describe the behavior of special purpose diodes.

UNIT - I

Diode: PN junction Diode Characteristics, Current equation, Temperature dependence, Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances,

Diode Applications: Rectifier Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive Filter, Clippers, Clampers.

UNIT - II

Bipolar Junction Transistor (BJT): Principle of Operation and characteristics Common Emitter, Common Base, Common Collector Configurations, Operating point, DC & AC load lines, Transistor Hybrid parameter model, Determination of h-parameters from transistor characteristics, Conversion of h-parameters.

UNIT - III

Transistor Biasing and Stabilization: Bias Stability, Fixed Bias, Collector to Base bias, Self Bias, Bias compensation using Diodes and Transistors.

Analysis and Design of Small Signal Low Frequency BJT Amplifiers: Analysis of CE, CC, CB Amplifiers and CE Amplifier with emitter resistance, low frequency response of BJT Amplifiers, effect of coupling and bypass capacitors on CE Amplifier.

UNIT - IV

Junction Field Effect Transistor: Construction, Principle of Operation, Pinch-Off voltage, Volt-Ampere characteristic, comparison of BJT and FET, Biasing of FET, FET as voltage variable resistor, MOSFET construction and its characteristics in enhancement and depletion modes.

UNIT - V

FET Amplifiers: Small Signal Model, Analysis of CS, CD, CG JFET Amplifiers. Basic Concepts of MOSFET Amplifiers.

Special Purpose Devices: Zener Diode Characteristics, Voltage Regulator; Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode.

TEXT BOOKS:

1. Millman and Halkias," Electronic devices and circuits", 2nd Edition, McGraw Hill Publication, 2007.
2. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.

REFERENCES:

1. Electronic Devices and Circuits – S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, 2 Ed., 2008, TMH.
2. Electronic Devices and Circuits-J.B Gupta
3. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP

DATA STRUCTURES

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Understand the concepts of Stacks and Queues with their applications.
2. Analyze various operations on Binary trees.
3. Examine of various concepts of binary trees with real time applications.
4. Analyze the shortest path algorithm on graph data structures.
5. Outline the concepts of hashing, collision and its resolution methods using hash functions.

UNIT -I:

Data Structures: Introduction, Types of data structures, Static and Dynamic representation of data structure and comparison. **Stacks:** Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack.

Queues: types of Queues- Circular Queue, Deque and operations.

UNIT - II:

Trees: Basic terminologies, Types of Binary Tree: Complete and Full Binary Tree, Extended Binary Trees, Representation of Trees using Arrays and Linked lists (advantages and disadvantages), Tree Traversal, Representation of Algebraic expressions, Threaded Binary Trees.

UNIT - III:

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Operations on BST, Representation and advantages of AVL Trees, algorithms& operations on AVL Trees,Multi-way trees, Definition and advantages of B-trees, B+ Trees, Red-Black Trees.

UNIT - IV:

Graphs-Basic terminology, Representation of graphs: sequential representation, Adjacency, Path Matrix) Linked representation. Graph Traversals-Breadth First Search, Depth First Search algorithms. Spanning Tree, Minimum Spanning Trees- Prim's Algorithm, Kruskals Algorithm, Dijkstra Algorithm.

UNIT -V:

Hashing: General Idea, Hash Functions, collisions, Collision avoidance techniques, SeparateChaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Implementation of Dictionaries

Text Books:

1. Data Structures Using C, Second Edition Reema Thereja OXFORD higherEducation
2. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg&Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition,2005.

Reference Books:

1. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition.
2. Data Structures Using C and C++‖, Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, DelhiIndia.
3. Fundamentals of Data Structures‖, Horowitz and Sahani, *Galgotia Publications* Pvt Ltd Delhi India.
4. Data Structure Using C, A.K. Sharma, Pearson EducationIndia.

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Analyze elementary mathematical arguments.
2. Apply discrete mathematics problems that involve computing permutations and combinations of a set.
3. Analyze problems involving recurrence relations & generating functions.
4. Demonstrate various operations on discrete structures.
5. Apply graph theory models to solve the problems of networks.

UNIT - I:

Foundations: Basics, Sets, Statements, Connectives, Normal Forms, Fundamentals of Logic, Logical Inferences, First order logic and other methods of Proof, Rules of Inference for Quantified Propositions, Automatic Theorem Proving.

UNIT – II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with & without repetitions, constrained repetitions, Pigeon hole principle, Inclusion-Exclusionprinciple.

UNIT - III:

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations, Binomial Theorem.

UNIT - IV:

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, Paths and Closures, Directed Graphs and adjacency matrices.

UNIT - V:

Graphs - Basic Concepts, Isomorphism and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler‘s Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. Discrete Mathematics forComputer Scientists and Mathematicians by JoeL.Mott, AbrahamKandel, TheodareP.Baker, Second Edition, PHI,2009.
2. Discrete Mathematical Structures with Applications to Computer Science, Tremblay J P and Manohar R, Tata McGraw Hill Publishing Company Limited, New Delhi,2007.

Reference Books:

1. Discrete Mathematics R.K.Bisht, H.S.Dhami, OXFORD HigherEducation.
2. Discrete Mathematics and its Applicationsǁ, Kenneth H Rosen, Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition,2007.

PYTHON PROGRAMMING

B. Tech. II Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Identify the differences between scripts and programs
2. Solve the problems based on decision control statements
3. Develop programs on functions and data structures.
4. Demonstrate the programs on string operations
5. Analyze the object oriented techniques for solving real time problems

Unit – I:

Introduction to Python:

Features of Python Language, Data Types, Operators, Expressions, Control Statement, Standard I/O Operations.

Functions and Modules:

Declaration and Definition Function Calling, More on Defining Functions, Recursive Functions, Modules, Packages in Python, Doc Strings, Built-in Functions.

Unit – II:

Strings and Regular Expressions:

String Operations, Built-in String Methods and Functions, Comparing Strings, function in Regular Expression.

Sequence: List, Tuples, Dictionaries.

Unit: III:

Introduction to Object Oriented Programming:

Features of Object OrientedProgramming, Classes and Objects, Class Method and Self Argument. The InitMethod, Class Variables and Object Variables, The DelMethod, Public and Private Data Members, Private Methods, Buil-in Functions to Check, Get, Set and Delete Class Attributes, Garbage Collection(Destroying Objects).

Unit – IV:

Inheritance:

Inheriting Classes in Python: Types of Inheritance; Composition/Containership, Abstract Classes, Meta class.

Operator Overloading:

Introduction, Implementing Operator Overloading, Overriding Methods.

Unit – V:

File Handling

Introduction, Types of Files, Reading and Writing Files, File Positions, Renaming and Deleting Files, Listing files of directory.

Exception Handling:

Introduction, Handling Exception, Multiple Except Blocks and Multiple Exceptions, Finally Block.
Case Study: Data Science.

Text Books

1. "ReemaThareja", Python Programming using Problem Solving Approach, First Edition, Oxford Higher Education.
2. James Payne, Beginning Python using Python 2.6 and Python 3.

Reference Books

1. Kenneth A.Lambert, Fundamentals of Python.
2. Charles Dierach, Introduction to Computer Science using Python.

DATA STRUCTURES & PYTHON PROGRAMMING LAB

B. Tech. II Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course student would be able to

1. Develop the programs on stacks, trees and its applications.
2. Design and implementation of programs on BST and Graph Traversals.
3. Apply Hashing techniques in real world applications
4. Implement oops concepts in Python
5. Develop Programs on modules and Packages
6. Design Programs that handle errors

Part-A

1. C Programs to illustrate concepts of arrays, structures, unions and enumerated datatypes.
2. Program to convert infix to postfixnotation
3. Program to evaluate postfixnotations
4. Program to illustrate treetraversals
    i. In order b) Pre order c) Post order
5. Program to illustrate insertion, deletion and searching in Binary SearchTree.
6. Program to illustrate Insertion, deletion and Rotation on AVLTrees.
7. Program to illustrate Graphtraversals
    i. Breadth First Search
    ii. Depth First Search
8. Program to implement hash table using linear and quadraticprobing.

Part- B

Exercise I

a) Installation and Environment setup of python.

b) Write a program to demonstrate the use of basic Data Types

c) Write a program to demonstrate the Operators and Expressions

d) Write a program to demonstrate the Functions and parameter passing Techniques.

Exercise II

a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)

b) Write a program to convert a given decimal number to other base systems

Exercise III

a) Write a Program to implement

i. Packages **ii.**Modules **iii.** Built-in Functions

b) Write a Program to implement

i. List **ii.**Tuple **iii.** Dictionaries

c) Programs on Stings, String Operations and Regular Expressions

Exercise IV

a) Write a Program to implement Class and Object

b) Write a Program to implement Static and Instance methods, and Abstract Classes.

Exercise V

a) Write a program to implement Inheritance

b) Write a program to implement Polymorphism

Exercise VI

a) Write a program to implement Files

b) Write a program to Implement Exception Handling.

DIGITAL LOGIC DESIGN & ELECTRONIC DEVICES & CIRCUITS LABORATORY

B. Tech. II Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course student would be able to

1. Identify and use the basic components and instruments in electronics laboratory
2. Outline the characteristics of different semiconductor devices.
3. Interpret the ripple factor, regulations of rectifiers.
4. Understand the concepts of UJT and observe its characteristics.
5. Design and construct the combinational and sequential circuits using digital IC's

Minimum 6 experiments from each part:

List of Experiments (EDC)

1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration and h-parameter calculations.
6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
7. FET characteristics.
8. UJT Characteristics

List of Experiments (DLD)

1. Verify the functionality of logic gates &Flip-flops
2. Verification of De-Morgan's laws
3. Implementation and verification of full adder and full subtractor using logic gates.
4. Implementation and verification of 4X1 multiplexer & Demultiplexer using logic gates.
5. Implementation and verification of 2X4 Decoder and 1X4 De-multiplexer using logic gates.
6. Implementation of given function and verification using IC 74LS151 (8X1 multiplexer).
7. To design and verify the 4-bit ripple counter & decade counter
8. Verify the functionality of 4-bit magnitude comparator using IC 74LS85.
9. Verify the functionality of Universal Shift Register IC 74LS194/195

CYBER LAW

B. Tech. II Year I Semester

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of this course, the student would be able to

1. Understand Cyber Crimes & legal framework
2. Outline the features of IT Act2000
3. The application of Cyber laws in India
4. Examine the Intellectual property rights and related laws
5. Analyze the E-commerce governing laws in India

UNIT - I

Introduction to Cyber Law: Need for Cyber Law, Introduction to UNICITRAL Model Law on E-Commerce, Cyber Jurisprudence at International and Indian Level, Jurisdictional Aspects in Cyber Law, Issues of jurisdiction in cyberspace, Types of jurisdiction, Prerequisites of jurisdiction. Case Lets: Indian & International Cases -Case Lets: Indian & International Cases

UNIT - II

Cyber Crimes & Legal Framework: Introduction to Cyber Crimes, Cyber Crimes Vs. Conventional Crime, Reasons for cybercrimes and cyber criminals, Cyber Crimes against Individuals, Institution and State, Cyber Crimes Hacking Digital Forgery, Cyber Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber Terrorism, Cyber Defamation. - Right of Interception under IT Act. Different offences under IT Act, 2000 -Case Lets: Indian & International Cases

UNIT –III

Cyber Forensic and Computer Crimes: Crimes targeting Computers: Definition of Cyber Crime & Computer related Crimes, Classification & Differentiation between traditional crime and cybercrimes. (a) Data Theft (b) Hacking (c) Spreading Virus & Worms (d) Phishing (e) Cyber Stalking / Bullying (f) Identity Theft & Impersonation (g) Credit card & Online Banking Frauds (h) Obscenity, Pornography & Child Pornography (i) Cyber Defamation, Defacement, (j) Illegal online selling & Gambling (k) Denial of Service Attacks (l) Cyber terrorism (m)Software Piracy & illegal downloading -Case Lets: Indian & International Cases

UNIT– IV

Information Technology Law (Cyber Law): Evolution of the IT Act, Genesis and Necessity, Salient features of the IT Act, 2000, various authorities under IT Act and their powers. Penalties & Offences, amendments. Impact on other related Acts (Amendments to Indian Penal code, Indian evidence Act, Banker Book Evidence Act, RBI Act) Case Lets: Indian & International Cases.

UNIT-V

Evolution of E Commerce and Laws in India: Introduction to E Commerce in India. E – Commerce; Issues and provisions in Indian Law, E – Governance; concept and practicality in India, Digital/ Electronic Signature in Indian Laws E – Taxation issues in Cyberspace, E – Contracts and its validity in India. Case Lets: Indian & International Cases

TEXT BOOKS:

1. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi, (2012).
2. Karnika Seth, Computers, Internet and New Technology Laws, Lexis Nexis Butterworths Wadhwa Nagpur, (2013).

Reference Books:

1. Apar Gupta, Commentary on Information Technology Act, 2000, Lexis Nexis, (2015).
2. Verma S, K, Mittal Raman, Legal Dimensions of Cyber Space, Indian Law Institute, New Delhi, (2004).
3. SudhirNaib, the Information Technology Act, 2005: A Handbook, OUP, New York, (2011).

DESIGN AND ANALYSIS OF ALGORITHMS

B. Tech. II Year II Semester

L	T	P	C
3	1	0	4

Course Outcomes:

At the end of the course student would be able to

1. Analyze the efficiency of algorithms
2. Develop algorithms divide & conquer, greedy and related problems
3. Examine the performance of Dynamic programming
4. Explain performance of algorithm using Backtracking
5. Analyze NP-Hard and NP-Complete problems

UNIT I:

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Disjoint Sets- disjoint set operations, union and find operations.

Divide and conquer: General method, applications - Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT II:

Graphs: Breadth First Search, Depth First Search, spanning trees, connected Andbi- connectedcomponents.

Greedy method: General method, Applications- Optimal storage on Tapes, Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III:

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph colouring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT V:

Lower Bound Theory: Comparison Trees, NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Satisfiability problem, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharan, Galgotia publications Pvt.Ltd.
2. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearsoneducation.

References:

1. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGrawHill.
2. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearsoneducation.

COMPUTER ORGANIZATION

B. Tech. II Year II Semester

L	T	P	C
3	0	0	3

Course outcomes:

At the end of the course student would be able to

1. Understand the basic organization of computer and different instruction formats and addressingmodes.
2. Outline the concepts of 8086 microprocessor and arithmeticoperations.
3. Make use of micro processor instructions to write simple programs in assemblylanguage.
4. Classify various modes of datatransfers.
5. Outline various inter connection structures of multiprocessors.

UNIT I:

Introduction to computer organization- Digital Computers,Instruction codes, stored program organization, computer registers, computer instructions , instruction cycle, types of instruction formats (Zero, one, two and three address), RISC instructions.

Addressing modes: mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems.

UNIT II:

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, segment register and generation of 20 bit address, concept of address, data, control and systems bus, Types offlags.

UNIT III:

CPU and Main Memory interface- Programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP).

Micro-programmed control: control memory, address sequencing, micro program example and design of control unit.

UNIT IV:

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus.

Modes of Transfer: Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority.

DMA: DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT V:

Multi Processors: Characteristics of Multi Processor; **Interconnection structures:** Time shared common bus, multiport memory, crossbar switch, multi-stage switchingnetwork; **Introduction to Flynn's classification:** SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

1. Computer System Architecture M.Morris Mano, Third Edition, Pearson/PHI,2011.
2. Microprocessor and Interfacing Douglas V Hall, Second Edition, TATA McGraw Hill,2006.

Reference Books:

1. Computer Organization Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition, McGraw Hill.

JAVA PROGRAMMING

B. Tech. II Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Understand OOP concepts to apply basic Java constructs.
2. Analyze different forms of inheritance and usage of Exception Handling
3. Understand the different kinds of file I/O,Multithreading in complex Java programs, and usage of Container classes
4. Contrast different GUI layouts and design GUI applications
5. Construct a full-fledged Java GUI application, and Applet with database connectivity.

UNIT I:

Java Basics History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming, Applications of OOP. Concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, static keyword, nested and inner classes, Strings, Object class.

UNIT II:

Inheritance & Polymorphism: Introduction, Forms of Inheritance - specialization, specification, construction, extension, limitation, combination, Member access rules, super keyword, polymorphism- method overriding, abstract classes, final keyword.

Interfaces and Packages: Introduction to Interfaces, differences between abstract classes and interfaces, multiple inheritance through interfaces, Creating and accessing a package, Understanding CLASSPATH, importing packages.

Exception handling Concepts of exception handling, exception hierarchy, built in exceptions, usage of try, catch, finally, throw, and throws, creating own exception sub classes.

UNIT III:

Files: Introduction to I/O Streams: Byte Streams, Character Streams. File I/O.

Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

Java.util package- Collection Interfaces: List, Map, Set. The Collection classes: LinkedList, HashMap, TreeSet, StringTokenizer, Date, Random, Scanner.

UNIT IV:

AWT: Class hierarchy, Component, Container, Panel, Window, Frame, Graphics.

AWT controls: Labels, Button, Scrollbar, Text Components, Checkbox, CheckboxGroup, Choice, List, Panes – ScrollPane, Dialog and MenuBar.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapterclasses.

UNIT V:

Layout Manager – Border, Grid, Flow, Card and Gridbag.

Applets Concepts of Applets, life cycle of an applet, creating applets, passing parameters toapplets.

JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

1. Java- the complete reference, Seventh edition, Herbert Schildt, Tata McGraw Hill.
2. Database Programming with JDBC&JAVA, Second Edition, George Reese, O'Reilly Media.

Reference Books:

1. Thinking in Java Fourth Edition, Bruce Eckel
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

SOFTWARE ENGINEERING

B. Tech. II Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Outline the framework activities for a givenproject.
2. Examine Right process model for a givenproject.
3. Analyze various system models for a givenContext.
4. Understand various testing techniques for a givenproject.
5. Identify various risks in projectdevelopment.

UNIT I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

UNIT II:

Process Models: The waterfall model, Incremental process models, Evolutionary process model, Unified process model,agile process model.

Software Requirements: Functional and non-functional requirements, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT III:

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

Design Engineering: Design process and Design quality, Design concepts, the design model, Modeling component level design: design class based components, conducting component level design.

User interface design: Golden rules.

UNIT IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testingtechniques, Validation testing, System testing.

Product Metrics: Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for Testing, Metrics for maintenance.

UNIT V:

Risk Management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

1. SoftwareEngineering, Apractitioner's Approach RogerS.Pressman,6th edition McGraw Hill InternationalEdition.
2. Software Engineering- Sommerville, 7th edition, Pearsoneducation.

References:

1. Software Engineering- K.K. Agarwal&Yogesh Singh, New Age InternationalPublishers
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz,JohnWiely.
3. Systems Analysis and Design- ShelyCashmanRosenblatt,ThomsonPublications.
4. Software Engineering principles and practice Waman S Jawadekar,The McGraw-Hill Companies.

DATABASE MANGEMENT SYSTEMS

L	T	P	C
3	0	0	3

B. Tech. II Year II Semester

Course Outcomes:

At the end of the course student would be able to

1. Understand the concepts of Entity-Relationship Model for enterprise level databases.
2. Analyze the database and provide restricted access to different users of database.
3. Understand various Normal forms to carry out schema refinement.
4. Analyze various Concurrency control protocols.
5. Examine working principles of Recovery algorithms.

UNIT-I:

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View, Database Language, Database Architecture, Database Users and Administrators.

Introduction to the Relation Models and Database Design using ER Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Feature, Structure of relational databases , database schema , keys, schema diagrams.

UNIT-II:

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions Nested Sub queries, Modification of theDatabase.

Intermediate and Advanced SQL: Join Expressions, Views, Integrity Constraints, SQL Data Types, Authorization. Functions and Procedures, Triggers.

UNIT-III:

Formal Relational Query Languages: The Relational operations, The Tuple Relational Calculus, The Domain Relational Calculus.

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Decomposition Using Multi valued Dependencies, BCNF.

UNIT-IV:

Transactions: Transaction Concept, a Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity.

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Timestamp- Based Protocols.

UNIT-V:

Recovery System: Failure Classification, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F. Korth,S.Sudarshan, Database System Conceptsǁ,6thEdition, Tata McGraw-Hill.
2. RaghuRamaKirshna,JohannesGehrk,DatabaseManagementSystemǁTataMcGrawHill 3rd Edition.

Reference Books:

1. PeterRob&CarlosCoronel—DatabaseSystemConceptsCengageLearning.
2. RamezElmasri, ShamkanthB. Navrate–Fundamentals of DatabaseSystems7th Edition, Pearson Education.
3. C.J. Date Introduction to Database Systems PearsonEducation

PROFESSIONAL COMMUNICATION

B. Tech. II Year II Semester

L	T	P	C
1	0	2	2

Course Outcomes

1. Acquire enhanced personality
2. Exhibit appropriate professional etiquette
3. Practice team building with strong communication skills
4. Develop problem solving skills and decision-making
5. Demonstrate effective presentation skills

UNIT-I:

Self Appraisal

Self Introspection/ Self Retrospection
Introducing self & others
Goal setting
SWOT Analysis,

UNIT- II:

Professional Etiquette

Etiquette-Telephone Etiquette- Netiquette
Email, Social Network
Behavioural Traits
Case study

UNIT-III:

Team Building

Leadership skills-Case Studies
Team Essentials
Negotiation Skills
Group Discussion-Functional Aspects

UNIT-IV:

Logical Thinking and Analytical Reasoning

Decision Making
Problem Solving
Conflict management
Case Study

UNIT-V:

Presentation Skills

Poster Presentation
Oral Presentation-Individual Presentation, Team Presentation, Thematic Presentation

Text Book

1. Ashrif Rizvi. Effective Technical Communication, Tata Mc Gahill, 2011.

Reference Books

1. Speaking and Writing for Effective Business, Soundaraja, MACMILLAN, 2010.
2. English for Professional Success, Hector Sanchez, THOMSON, 2010.

JAVA PROGRAMMING LAB

II Year B.Tech. CSE - II Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course student would be able to

1. Apply basic Java constructs and OOP to solve mathematical problems.
2. Apply Inheritance in Java programs and Analyze Exception Handling code
3. Implement File input/output and multithreading concepts in advanced Java programs.
4. Design different GUI applications using GUI layouts.
5. Apply Applet development and Database connectivity to build GUI applications

Week 1 & 2:

6. Write a program to find total, average of given two numbers by using function with command-line arguments, static datamembers.
7. Write a program to illustrate class and objects.
8. Write a program to illustrate method & constructor overloading.
9. Write a program to illustrate parameter passing using objects.
10. Write a program to illustrate ArrayManipulation.

Week 3:

11. Write a program to illustrate different types of inheritances.
12. Write a java program to illustrate Methodoverriding.
13. Write a java program to demonstrate the concept ofpolymorphism (Dynamic Method Dispatch).
14. Write a program to demonstrate finalkeyword.

Week 4 & 5:

15. Write a program to illustrate the use of creation ofpackages.
16. Write a java program to handle the situation of exceptionhandling using multiple catch blocks.
17. Write a program to implement the concept of User definedExceptions.

Week 6 & 7:

18. Write a program to illustrate Multithreading andMultitasking.
19. Write a program to illustrate threadpriorities.
20. Write a program to illustrateSynchronization.

Week 8 & 9:

21. Write a program to implementStringTokenizer.
22. Write a program to read one line at a time, and write it to another file.

Week 10 & 11:

18. Write a program to illustrate Event Handling (keyboard, Mouseevents)
19. Write a program to illustrate appletlife cycle and parameter passing.

Week 12:

20. Write a program to develop a calculator application usingAWT.

Week 13:

21. Write a program to illustrateJDBC.

DATABASE MANAGEMENT SYSTEMS LAB

B. Tech. II Year II Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course student would be able to

1. Use the SQL commandssuch as DDL, DML and DCL statements to perform different operations.
2. Apply various Integrity constraints on the database tables.
3. Apply Joins to retrieve the information from multiple tables.
4. Design different Views of tables for different users.
5. Design and implement a PL/SQL program which includes procedures, functions, cursors and triggers.

1. Database Schema for a customer-sale scenario

Customer(**Cust id : integer**, cust_name: string)
Item(**item_id: integer**,item_name: string, price:integer)
Sale(**bill_no: integer**, bill_data: date, **cust_id: integer, item_id: integer**, qty sold: integer)
For the above schema, perform the following

- **a.** Create the tables with the appropriate integrityconstraints
- **b.** Insert around 10 records in each of thetables
- **c.** List all the bills for the current date with the customer names and itemnumbers
- **d.** List the total Bill details with the quantity sold, price of the item and the finalamount
- **e.** List the details of the customer who have bought a product which has aprice>200
- **f.** Give a count of how many products have been bought by eachcustomer
- **g.** Give a list of products bought by a customer having cust_id as5
- **h.** List the item details which are sold as oftoday
- **i.** Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold,amount Create a view which lists the daily sales date wise for the last oneweek

2. Database Schema for a Student Libraryscenario

Student(**Stud_no : integer,**Stud_name: string)
Membership(**Mem_no: integer,Stud_no: integer**)
Book(**book_no: integer**, book_name:string, author: string)
Iss_rec**(iss_no:integer**, iss_date: date, **Mem_no: integer, book_no: integer**)
For the above schema, perform the following

- **a.** Create the tables with the appropriate integrityconstraints
- **b.** Insert around 10 records in each of thetables
- **c.** List all the student names with their membershipnumbers
- **d.** List all the issues for the current date with student and Booknames
- **e.** List the details of students who borrowed book whose author isCJDATE
- **f.** Give a count of how many books have been bought by eachstudent
- **g.** Give a list of books taken by student with stud_no as5
- **h.** List the book details which are issued as oftoday
- **i.** Create a view which lists out the iss_no, iss _date, stud_name, bookname
- **j.** Create a view which lists the daily issues-date wise for the last oneweek

3. Database Schema for a Employee-payscenario

employee(**emp_id:**integer,emp_name:string)
department(**dept_id:integer**,dept_name:string)
paydetails(**emp_id : integer,dept_id: integer**, basic: integer, deductions: integer, additions: integer, DOJ: date)
payroll**(emp_id : integer**, pay_date: date)
For the above schema, perform the following

- **a.** Create the tables with the appropriate integrityconstraints
- **b.** Insert around 10 records in each of thetables
- **c.** List the employee details departmentwise
- **d.** List all the employee names who joined after particulardate
- **e.** List the details of employees whose basic salary is between 10,000 and20,000
- **f.** Give a count of how many employees are working in eachdepartment
- **g.** Give a names of the employees whosenetsalary>10,000
- **h.** List the details for anemployee_id=5
- **i.** Create a view which lists out the emp_name, department, basic, dedeuctions,netsalary
- **j.** Create a view which lists the emp_name and hisnetsalary

4. Database Schema for a Video Library scenario

Customer(**cust_no: integer**,cust_name: string)
Membership(**Mem_no: integer, cust_no: integer**)
Cassette(**cass_no:integer**, cass_name:string, Language:String)
Iss_rec**(iss_no: integer**, iss_date: date**, mem_no: integer, cass_no: integer**)
For the above schema, perform the following

- **a.** Create the tables with the appropriate integrityconstraints
- **b.** Insert around 10 records in each of thetables
- **c.** List all the customer names with their membershipnumbers
- **d.** List all the issues for the current date with the customer names and cassettenames
- **e.** List the details of the customer who has borrowed the cassette whose title is ―The Legend‖
- **f.** Give a count of how many cassettes have been borrowed by eachcustomer
- **g.** Give a list of book which has been taken by the student with mem_no as5
- **h.** List the cassettes issues fortoday
- **i.** Create a view which lists outs the iss_no, iss_date, cust_name,cass_name
- **j.** Create a view which lists issues-date wise for the last oneweek

5. Database Schema for a student-Lab scenario

Student(**stud_no: integer**, stud_name: string**, class: string**)
Class(**class: string,descrip:string**)
Lab(**mach_no: integer**, Lab no: integer, description: String)
Allotment(**Stud_no: Integer, mach_no: integer, day of week: string)**
For the above schema, perform the following

- **a.** Create the tables with the appropriate integrityconstraints
- **b.** Insert around 10 records in each of thetables
- **c.** List all the machine allotments with the student names, lab and machinenumbers
- **d.** List the total number of lab allotments daywise
- **e.** Give a count of how many machines have been allocated to the 'IT'class
- **f.** Give a machine allotment details of the stud_no 5 with his personal and classdetails

g. Count for how many machines have been allocated in **Lab_no 1** for the day of the week as –Monday‖

h. How many students class wise have allocated machines in thelabs

i. Create a view which lists out the stud_no, stud_name, mach_no, lab_no,dayofweek

j. Create a view whichliststhe machine allotmentdetailsfor–Thursday.

6. **Create a cursor, which displays all employee numbers and names from the EMP table.**

7. **Create a cursor, which update the salaries of all employees as per the given data.**

8. **Create a cursor, which displays names of employees having salary > 50000.**

9. **Create a procedure to find reverse of a given number.**

10. **Create a procedure to update the salaries of all employees as per the given data.**

11. **Create a procedure to demonstrate IN, OUT and INOUT parameters.**

12. **Create a function to check whether given string is palindrome or not.**

13. **Create a function to find sum of salaries of all employees working in depart number 10.**

14. **Create a trigger before/after update on employee table for each row/statement.**

15. **Create a trigger before/after delete on employee table for each row/statement.**

16. **Create a trigger before/after insert on employee table for each row/statement.**

GENDER SENSITIZATION

B. Tech. II Year II Semester

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course student would be able to

1. To develop awareness about gender discrimination and take measurable steps to counter it.
2. To identify the basic dimensions of biological, sociological, psychological and legal aspects of gender.
3. To acquire knowledge about gendered division of labour in relation to politics and economics.
4. To prepare the students against gender violence.
5. To prepare the students to work and live together as equals.

UNIT-I:

UNDERSTANDING GENDER

Gender: Why Should We Study It?

Socialization: Making Women, Making Men

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

UNIT-II:

GENDER AND BIOLOGY

Missing Women: Sex Selection and Its Consequences

Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary Two or Many? Struggles with Discrimination.

UNIT-III:

GENDER AND LABOUR

Housework: the Invisible Labour

"My Mother doesn't Work." "Share the Load."

Women's Work: Its Politics and Economics

Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

UNIT-IV:

ISSUES OF VIOLENCE

Sexual Harassment: Say No!

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading:"Chupulu".

Domestic Violence: Speaking Out

Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading:New Forums for Justice.

Thinking about Sexual Violence

Blaming the Victim-"I Fought for my Life…." Additional Reading: The Caste Face ofViolence.

UNIT-V:

GENDER: CO - EXISTENCE

Just Relationships: Being Together as Equals

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers.

Additional Reading: Rosa Parks-The Brave Heart.

TEXTBOOK

1.**"Towards a World of Equals: A Bilingual Textbook onGender"**

Written by A. Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, Deepa Sreenivas and Susie Tharu

Published by **Telugu Akademi, Hyderabad,** Telangana State**, 2015**.

REFERENCE BOOKS:

1. Menon, Nivedita, Seeing like a Feminist, New Delhi, Zubaan, Penguin Books, 2012.
2. Abdulali Sohaila, "I Fought For My Life…and Won."

ENVIRONMENTAL SCIENCE

II Year B.Tech. CSE – I/II Semester

L	T	P	C
2	0	0	0

Course Outcomes:

At the end of the course student would be able to

1. Define and explain the structure and functions of ecosystem, values of biodiversity, threats to biodiversity and conservation of biodiversity.
2. Explain the limitations of the resources and impacts of over utilization of natural resources.
3. Explain the sources and effects of environmental pollution and list and identify the available techniques to control the pollution.
4. Explain the global environmental issues like climate change, ozone depletion and can explain the scope of EIA, Environmental Management Plan and environmental audit and list the EIA methods.
5. Mention the salient features of environmental acts and rules and define the sustainable goals along with measures required for the sustainability.

UNIT I:

Ecosystem: Definition, Scope and Importance of ecosystem, Structure and Functions of ecosystem: Food chains, Food Web and Ecological Pyramids, Flow of energy; Bio-magnification.

Biodiversity and Biotic Resources: Introduction, Definition, levels of Biodiversity, Values of biodiversity, Hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT II:

Natural Resources: Classification of Resources, **Water resources**: use and over utilization of surface and ground water, Dams: benefits and problems, Rain water harvesting; **Energy resources**: growing energy needs, Renewable and Non Renewable Energy resources. **Land resources**: land degradation – Landslide and Soil Erosion; **Forest Resources –** Uses and Exploitation.

UNIT III:

Environmental Pollution And Control: Types of Pollution, Sources, Effects and Control measures of Air Pollution, WaterPollution, Soil Pollution and Noise Pollution.

UNIT IV:

Global Environmental Problems and Global Efforts: Green house effect, Global Warming, climate change and their impacts on human environment; Ozone depletion and Ozone depleting substances (ODS); Aid Rains.

Environmental Impact Assessment (EIA): Scope of EIA, EIA methods, scope of Environmental audit and Environmental Management Plan.

UNIT V:

Environmental Policy, Legislation, Rules And Regulations: Salient features of Environmental Protection act, Air (Prevention and Control of pollution) Act- 1981, Water (Prevention and Control of pollution) Act-1974, Forest Conservation Act, Municipal solid waste, Hazardous waste, E-waste, Bio-medical waste and Radioactive waste Rules.

Towards Sustainable Future: Concept of Sustainable Development, Sustainable goals defined by UN, Threats to Sustainability, Environmental Education, Role of IT in Environment, Smart Cities, Concept of Green Building, Low Carbon Lifestyle, Life cycle assessment and Ecological Foot Print.

TEXT BOOKS:

1. Text Book of Environmental Studies by Anubha Kaushik (4th Edition), New age International Publishers.
2. Environmental studies by ErachBharucha 2005, University Grants Commission, University Press.

REFERENCE BOOKS:

1. Text book of Environmental Science and Technology by M.Anji Reddy 2007
2. Environmental Science: Towards a Sustainable Future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental studies, From crisis to cure by R.Rajagopalan, 2005

COURSE STRUCTURE FOR B.TECH III YEAR

B. Tech. III Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Formal Languages and Automata Theory	3	0	0	3
2	PC-10	Computer Networks	3	0	0	3
3	PC-11	Operating Systems	3	0	0	3
4	PC-12	Web Technologies	3	0	0	3
5	PE-1	Human Computer Interaction Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE – 1	Open Elective –I	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**		**4**	**21**

B. Tech. III Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	H&S	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data Warehousing & Data Mining	3	0	0	3
4	PC-15	Artificial Intelligence	3	0	0	3
5	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	OE – 2	Open Elective –II	3	0	0	3
7	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	H & S	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -2	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

FORMAL LANGUAGES AND AUTOMATA THEORY

L	T	P	C
3	0	0	3

B. Tech. III Year I Semester

Prerequisites: Discrete mathematics and any programming language.

Course Outcomes:

At the end of the course, student will be able to:

1. Appreciate the role and structure of Language theory.
2. Design of regular expressions for language constructs and conversions of NFA and DFA.
3. Demonstrate the derivations and properties of various CFG and Regular grammars.
4. Design of PDA for the given CFG.
5. Appreciate the role of the Turing machine as computational and universal machine.

Unit -I:

Fundamental concepts: Strings, Alphabets, Language operations, Regular Expressions, Regular Languages: Finite automata, Types of finite automata (FA)-Non deterministic Finite Automata (NFA), Deterministic Finite Automata(DFA), NFA with ε-Moves, regular expression representation; Regular expressions to NFA; NFA with ε-Moves to NFA without ε-Moves; NFA to DFA Conversions; Minimization of DFA (Proofs Not Required).

Unit -II:

DFA with outputs: Moore and Melay machines, Pumping Lemma for Regular Sets: Closure properties of Regular Sets (Proofs Not Required): Context Free Grammars (CFG), Right most, Left most –derivations, Parse Trees; Operator Grammar: Unit productions; Chomsky normal forms; (Proofs Not Required).

Unit –III:

Left recursion and Elimination of left recursion in CFG: Elimination of useless symbols and unit productions; Greibach Normal Form, Push Down automata (PDA): Types of PDA: Design of a PDA for a given CFG. (Proofs Not Required)

Unit -IV:

Regular Grammars (RG), Design of DFA for a given RG: Right linear and left linear Grammars and conversions: Definition of Context Sensitive Grammar (CFG) and Linear bounded automata (LBA) (Proofs Not Required).

Unit -V:

Definition of unrestricted Grammar and Turing Machine (TM): Chomsky hierarchy on Languages, Grammars and recognizers; Design of TM as recognizer; Types of TM: Computational problems of TM with multiple tracks; Decidability Problem; Churches hypothesis (Proofs Not Required)

Text Books:

1. John E.Hopcroft, Rajeev Motwani, Jeffrey D.Ullman, Introduction to Automata Theory, Languages and Computation, Third Edition, Pearson, 2013.

Reference Books:

1. Daniel I.A.Cohen, Introduction to Computer Theory, Second Edition, John Wiley.
2. John C Martin, Introduction to languages and the theory of Computation, Third Edition, TATA McGraw Hill, 2014.
3. VivekKulakarni, Theory of Computation, Oxford University press 2013, Second Edition, 2014.

COMPUTER NETWORKS

B. Tech. III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the overview of reference models.
2. Classify and illustrate various sub protocols in multi access protocols.
3. Understand various routing algorithms and their operations.
4. Recommend transport protocol for the given scenarios.
5. Identify the protocols and functionalities in application layer

UNIT - I:

Overview of the Internet: Definition of networks, Topology, Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

UNIT - II:

Data Link Layer - Design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer – CSMA/CD with Binary Exponential Back off, Ethernet Performance, Switched, Fast, Gigabit, 10-Gigabit Ethernets, Data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, **Count to Infinity Problem**, Hierarchical Routing, Congestion control algorithms, admission control

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

UNIT - IV:

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

The Internet Transport Protocols: UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

UNIT - V:

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav,2nd Edition,Pearson Education.
2. Understanding Communications And Networks,3rdEdition,W.A .Shay,Cengage Learning.
3. Introduction To Computer Networks And Cyber Security,Chwan-Hwa(John)Wu,J.David Irwin, CRC Press.
4. Computer Networking:Atop Down Approach Featuring The Internet, James F.Kurose,K.W.Ross,3rd Edition, Pearson Education.

OPERATING SYSTEMS

L	T	P	C
3	0	0	3

B. Tech. III Year I Semester

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the basic functions of Operating systems and system calls.
2. Analyze process scheduling and synchronization.
3. Understand the concepts of memory management.
4. Examine the concepts of MASS storage structure
5. Compare different protection methods of OS and understand the deadlock concepts.

UNIT - I:

Operating System Introduction: Operating Systems Objectives and functions, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Virtual Machines.

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switching, Preemptive Scheduling, Scheduling Criteria, Scheduling algorithms, thread scheduling, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms, Thrashing.

UNIT - IV:

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management.

UNIT - V:

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

Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.

1. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
2. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
3. Operating Systems, A. S. Godbole, 2nd Edition, TMH

WEB TECHNOLOGIES

L	T	P	C
3	0	0	3

B. Tech. III Year I Semester

Course Outcomes:

At the end of the course, student will be able to:

1. Develop static and dynamic web pages using HTML and javascript.
2. Understand the XML tags and to parse XML data with java.
3. Develop web applications using server side programming with PHP.
4. Implement web applications using JDBC and Servlets.
5. Apply web applications with JSP.

UNIT –I:

Introduction to HTML: HTML tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets
Client Side Scripting: Java Script Language – Declaring variables, Scope of variables, Functions, Objects in java scripts, Dynamic HTML with java scripts, Form Validation.

UNIT –II:

XML: Introduction to XML, Defining XML tags their attributes and values, Document Type Definition, XML Schema, Document Object Model, and XHTML.
Parsing XML Data: DOM and SAX Parsers in java.

UNIT –III:

Introduction to PHP:
Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc. Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.
File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files listing directories.

UNIT –IV:

Introduction to Servlets: Common Gateway Interface (CGI), The Servlet API, Life cycle of a Servlet, Deploying a Servlet, Reading Servlet parameters, Reading Initialization parameters, Handling HTTP Request &Responses,Using Cookies and Sessions,
Introduction to JDBC: JDBC Drivers, JDBC Process, Connecting to a Database using JDBC

UNIT –V:

Introduction to JSP: The Anatomy of a JSP Page, Introduction to MVC Architecture, JSP Processing, Declarations, Directives, Expressions, Code Snippets, Implicit Objects, Using Beans in JSP Pages, Using Cookies and Session for Session Tracking, Connecting to Database using JSP.

TEXT BOOKS

1. Programming the World Wide Web 7th Edition by Robert W. Sebesta
2. Web Technologies Uttam K Roy, Oxford University Press

REFERENCE BOOKS

1. Web Programming, Building Internet Applications , Chris Bates 2nd edition , Wiley Dreamtech
2. Java Script , D Flanagan, O'Reilly,SPD
3. Java Server Pages- Hans Bergsten , SPD O'Reilly.

HUMAN COMPUTER INTERACTION
(Professional Elective-1)

L	T	P	C
3	0	0	3

B. Tech. III Year I Semester

Course Outcomes:

At the end of the course, students will be able to

1. Explain the capabilities of both humans and computers from the viewpoint of human information processing.
2. Describe and use HCI design principles, standards and guidelines.
3. Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
4. Discuss about different mobile applications and related design issues.
5. Analyze and discuss HCI issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I:

FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning and problem solving; the **computer-**Display Devices, Memory, processing and networks.
The Interaction- Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface, Interactivity.

UNIT II:

DESIGN PROCESS: Interaction Design basics The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping.
HCI in software process software life cycle, Usability engineering, Design rationale.
Design rules Principles to support usability, Standards, guidelines Golden rules and heuristics.

UNIT III:

MODELS AND THEORIES: Cognitive models, Socio-Organizational issues and stake holder requirements, Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks.
Types of Mobile Applications: Widgets, Applications, Games, Mobile Information Architecture.
Mobile Design: Elements of Mobile Design, Tools, **Mobile 2.0**.

UNIT V:

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I, II & III).
2. Brian Fling, "Mobile Design and Development", First Edition, O'Reilly Media Inc., 2009 (UNIT –IV).

REFERENCE BOOKS

1. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009.(UNIT-V Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

LINUX PROGRAMMING
(Professional Elective-1)

L	T	P	C
3	0	0	3

III Year B.Tech. CSE – I Semester

Course Outcomes:

At the end of the course, student will be able to:

1. Understand and make effective use of Linux file handling utilities.
2. Solve problems using shell scripting language (bash).
3. Develop the skills necessary for systems programming.
4. Examine various operations involved in process and signal management.
5. Distinguish intra and inter process communication.

UNIT - I:

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.
Sed-Scripts, Operation, Addresses, Commands, Applications, awk-Execution, Fields and Records, Scripts, Operation, Patterns, Actions, functions.

UNIT - II:

Shell programming with Bourn again shell(bash) - Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT - III:

Files and Directories- File Concept, File types, File System Structure, Inodes, library functions kernel support for files, system calls for file I/O operations- open, create, read, write, close.
Directories-Creating, removing and changing Directories-mkdir, rmdir, chdir.

UNIT - IV:

Process - Process concept, process identification, process control process- creation, waiting for a process, process termination, Kernel support for process, zombie process, orphan process.
Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT - V:

Inter Process Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pies-creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions. Message Queues- APIs for message queues Semaphores- APIs for semaphores Shared Memory- APIs for shared memory.
Sockets- Introduction to Sockets, basic functions of Socket.

TEXT BOOKS:

1. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
2. Unix and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.

REFERENCE BOOKS:

1. Unix System Programming using C++, T. Chan, PHI.
2. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
3. UNIX for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
4. UNIX shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
5. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.
6. C Programming Language, Kernighan and Ritchie, PHI.

SOFTWARE PROJECT MANAGEMENT
(Professional Elective-1)

B. Tech. III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:
At the end of the course, student will be able to:

1. Compare and contrast the various CSM models.
2. Understand the principle of software engineering.
3. Examine the lifecycle phases, artifacts of the process and model based software architectures.
4. Compare various work flow process models.
5. Evaluate different software product metrics.

UNIT I:
Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II:
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 III:
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.

UNIT IV:
Work Flows of the process: Software process workflows, Inter Trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction 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 V:
Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Example: Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.
Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R)

TEXT BOOKS:

1. Software Project Management, Walker Royce, Pearson Education, 1998

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition,Tata Mc-Graw Hill,2006 .
2. Applied Software Project Management, Andrew Stellman& Jennifer Greene,O'Reilly,2006.
3. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly,2007. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.

COMPUTER GRAPHICS
(Professional Elective–1)

L	T	P	C
3	0	0	3

B. Tech. III Year I Semester
Course Outcomes:

At the end of the course, student will be able to:

1. Outline the areas of Computer Graphics.
2. Examine various 2D Geometrical transforms.
3. Understand 3D Geometrical transforms.
4. Apply different visible surface detection methods.
5. Plan the sequence of an animation for a given scenario.

UNIT-I:
Introduction
Application areas of Computer Graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors and work stations and input devices.
Output Primitives
Points and lines, tine drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II:
2D Geometrical Transformations
Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems.
2D Viewing
The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen- Sutherland and Cyrus-beck line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT-III:
3D Object Representation
Polygon surfaces, quadric surfaces. Spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.
3D Geometric transformations
Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and Clipping.

UNIT-IV:
Visible Surface Detection Methods:
Classification, back face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, and area sub division and octree methods.
Illumination Models and Surface Rendering Methods Basic illumination models, polygon rendering method.

UNIT-V
Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame system, Motion specification.

TEXT BOOKS

1 "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.

REFERENCE BOOKS

1 Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
2 "Computer Graphics Second edition", Zhigandxiang. Roy Plastock, Schaum's outlines. rats Mc Graw 19 edition.
3 Procedural elements lot Computer Graphics, David F Rogers. Tata Mc Graw hill, 2nd edition.
4 Principles of interactive Computer Graphics. Neuman and Sprout TMH.
5 Principles of Computer Graphics. Shalni, Govil-Pal, Springer.
6 Computer Graphics F.S.H. S.M.Kelley. PHI.

COMPUTER NETWORKS & OPERATING SYSTEMS LAB

B. Tech. III Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Implement various CPU scheduling algorithms
2. Apply the memory management techniques
3. Write Programs on File allocation strategies
4. Implement various algorithms for error detection and correction
5. Implement Algorithms on Shortest path routing
6. Write a program for congestion control

Week 1: Simulate the following CPU Scheduling Algorithms using C program:

a) FCFS b) SJF

Week 2: Simulate the following CPU Scheduling Algorithms using C program:

c) Priority d) Round Robin

Week 3: Simulate Paging Technique of Memory Management using C program.

Week 4: Write a program to implement page replacement algorithms (FCFS, Optimal, and LRU).

Week 5: Write a C program to simulate the following file allocation strategies.

a) Sequential b) Indexed c) Linked

Week 6: Write a program to implement Banker's algorithm for deadlock avoidance.

Week 7: Implement the data link layer farming methods such as character stuffing and bit stuffing.

Week 8: Implementation of hamming code algorithm

Week 9: Implement on a data set of characters the three CRC polynomials – CRC 12, CRC and CCIP.

Week 10: Implement Dijkstra's algorithm to compute the Shortest path through a graph.

Week 11: Take an example subnet of hosts. Obtain broadcast tree for it.

Week 12: Write a program for congestion control using leaky bucket algorithm.

WEB TECHNOLOGIES LAB

III Year B.Tech. CSE – I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of the course, student will be able to:

1. Design static web pages that perform client side authentication.
2. Understand XML data representation.
3. Create dynamic web application using PHP and access database.
4. Implement sessions in web applications
5. Design dynamic web applications using MVC architecture.

List of Experiments

Week 1: Create a Registration page using HTML.

Week 2: Create a static HTML application with three frames as below:
First frame at the top containing a header
Second frame a navigation frame that contains hyperlinks to open 3 other pages
Third frame that displays a page corresponding to the hyperlinks in the second frame

Week 3: Design a static HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

Week 4: Design a HTML page with required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.

Week 5: Validate the fields of registration page created in the first experiment using regular expressions in JavaScript.

Week 6: Validate an XML document using DTD and XML schema.

Week 7: Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b) SAX parser

Week 8: Create a PHP application that reads request parameters from the registration page created in the first experiment and stores in the database.

Week 9: Create a PHP application program for authenticating users for the above program using sessions.

Week 10: Installation and configuration of Tomcat and deploy a simple "Hello World" servlet.

Week 11: Write a servlet that reads request parameters from the registration page created in the first experiment and stores in the database.

Week 12: Write a servlet program for authenticating users for the above program.

Week 13: Implement the following session handling techniques using servlets:

i) Cookies
ii) Hidden form field
iii) HttpSession
iv) URL Rewriting

Week 14: Create a JSP application that reads request parameters from the registration page created in the first experiment and stores in the database using Java Beans.

Week 15: Create a JSP application for authenticating users for the above program

QUANTITATIVE METHODS & LOGICAL REASONING
(Common for all Branches)

B. Tech. III Year I Semester

L	T	P	C
2	0	0	1

Course Outcomes:

At the end of the completion of the course a student is expected;

1. To perform well in various competitive exams and placement drives.
2. To solve basic and complex mathematical problems in short time.
3. To become strong in Quantitative Aptitude and Reasoning which can be applied for GRE, GATE, GMAT or CAT exam also.
4. To develop problem solving skills and analytical abilities, which play a great role in corporate and industry set up.

Quantitative Aptitude and Reasoning:

Unit – I:

Number System: Speed Maths, Numbers, Factors, Prime & Co Primes, LCM & HCF, Divisibility Rules, Finding Unit Place Digit and Last Two Digits of an Expression

Ratio, Proportion and Variations: Definition of Ratio, Ratio of Proportion, Comparison of Ratios, Compound ratio, Direct and Indirect Proportion

Percentages: Converting Fractions and Decimal into Percentages, Successive Percentage, Populations, Expenditure and Savings

Profit and loss: Relation between Cost Price and Selling Price, Discount and Marked Price, Gain or Loss Percentages on Selling Price

Simple and Compound Interest: Problems on Interest (**I**), Amount (**A**), Principal (**P**) and Rate of Interest (**R**) difference between the Simple Interest and Compound Interest for 2 and 3 years.

Unit – II:

Partnership: Relation between Partners, Period of Investment and Shares

Averages, Ages and Allegation : Average of Different Groups, Change in Averages by Adding, Deleting and Replacement of Objects, Problems on ages, Allegation Rule, Mean Value of the Mixture, Replacement of Equal Amount of Quantity.

Time and Work: Men and Days, Work and Wages, Pipes and Cisterns, Hours and Work, Alternate Days Concept,

Time and Distance: Difference between the Average and Relative Speeds, Reaching the Destination Late and Early, Stoppage Time Per Hour, Time and Distance between Two Moving Bodies : Train Crossing Man - same and opposite directions, Speed of Boat and Stream,

Unit – III:

Progressions and Quadratic Equations: Arithmetic, Geometric and Harmonic Progressions, Arithmetic Mean, Geometric Mean and Harmonic Mean and their Relations. General form of Quadratic Equation, Finding the Roots of Quadratic Equation, Nature of the Roots.

Permutation and Combination: Fundamental Rules, Problems on Permutations & combinations.

Probability: Definition of probability, Notations and Formulae, Problems on Probability.

Data Interpretation and Data Sufficiency: Tabular and Pie-charts, Bar and Line Graphs, Introduction to Data Sufficiency, Problems on Data Sufficiency.

Unit – IV:

Deductions: Statements and conclusions using Venn diagram and Syllogism Method

Series completion: Number series, Alphabet series, Letter Series.

Coding and Decoding: Letter coding, Number coding, Number to letter coding, Matrix Coding, Substitution, Mixed Letter Coding, Mixed Number Coding, Deciphering Individual Letter Codes by Analysis.

Analytical Reasoning Puzzles:

Problems on Linear, Double line-up and Circular Aarrangements, Selections and Comparisons.

Blood Relations:

Defining the various Relations among the Members of a Family, Solving Blood Relation Puzzles by using Symbols and Notations. Problems on Coded Relations.

Unit – V:

Direction sense Test: Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.

Clocks: Relation between Minute-Hour Hands, Angle vs Time, Exceptional Cases in Clocks

Calendars: Definition of a Leap Year, Finding the Odd days, finding the Day of any Random Calendar Date, repetition of Calendar Years.

Cubes and Dices: Finding the Minimum and Maximum Number of Identical Pieces and Cuts, Painting of Cubes and cuts, Problems on Dice.

Venn Diagrams: Circular Representation of given words, Geometrical Representation of Certain class, Set theory based Problems.

Text Books:

1. Verbal Reasoning, GL Barrons, Pinterest, Latest Edition 2019.
2. A Modern Approach to Logical Reasoning & Quantitative Aptitude, R S Agarwal, S. Chand, Publications, Revised edition, 2019.

Reference Books:

3. Quantitative Aptitude, G.L Barrons, Pinrest 2019.
4. Quantitative Aptitude, Abhijit Guha, Mc Graw Hills, Edition 2019.
5. Quantitative Aptitude, U. Mohan Rao SCITECH.

MANAGERIAL ECONOMICS & AND FINANCIAL ANALYSIS

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

PRE REQUISITES:

- Probability and statistics
- Operation research
- Mathematics-I
- Environmental studies

Course Outcomes:

1. The students will be able to
2. Understand the nature and scope of business economics.
3. Differentiate the various forms of Business organizations.
4. Identify the impact of economic variables on the Business firms
5. Analyze the Demand, Supply, Production, Cost, Market Structure, Pricing aspects
6. Analyze, compare and interpret the Financial Statements of a Company using ratios.

UNIT – I:

Introduction to Business and Economics: Business: Structure of Business Firm, Theory of Firm, Types of Business Entities, Limited Liability Companies, Sources of Capital for a Company, Non-Conventional Sources of Finance.

Economics: Significance of Economics, Micro and Macro Economic Concepts, Concepts and Importance of National Income, Inflation, Money Supply in Inflation, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist, Multidisciplinary nature of Business Economics.

UNIT – II:

Demand and Supply Analysis:

Elasticity of Demand: Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Elasticity of Demand in decision making, Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting.

Supply Analysis: Determinants of Supply, Supply Function & Law of Supply.

UNIT- III:

Production, Cost, Market Structures & Pricing:

Production Analysis: Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale.

Cost analysis: Types of Costs. Market Structures: Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, and Monopolistic Competition. Pricing: Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis, and Cost Volume Profit Analysis.

UNIT – IV:

Financial Accounting: Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, and Preparation of Final Accounts.

UNIT – V:

Financial Analysis through Ratios: Concept of Ratio Analysis, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios (simple problems).

TEXT BOOKS:

1. D. D. Chaturvedi, S. L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata McGraw Hill, 2011.

REFERENCES:

1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S.N. Maheshwari, Sunil.KMaheshwari, Sharad.KMaheshwari, Financial Accounting, 5e, Vikas Publications, 2013.
3. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

COMPILER DESIGN

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Formulate tokens for various programming languages.
2. Apply principles of parsing techniques to do syntax analysis.
3. Formulate semantic rules to do semantic analysis.
4. Apply optimization techniques on the intermediate code.
5. Generate the target code.

Unit - I:

Introduction to Compilers: Structure of Compiler-Phases of Compiler, Symbol Table Management, Grouping of Phases into Passes, Compiler Vs Interpreter.

Lexical Analysis: Role and need of Lexical Analyzer, Input Buffering, Regular expressions for identifiers, Signed numbers etc.., A Language for specifying Lexical Analyzer, Lexical phase errors.

Unit - II:

Syntactic Specification: Context Free Grammars, Derivations and Parse Trees, Capabilities of Context Free Grammars, Syntactic Phase errors, Semantic errors.

Basic Parsing Techniques: Parsers, Top-Down parsing, Predictive parsers and construction of predictive parsing and LL (1) parser table, LL (1) grammar.

Unit III:

Construction of efficient Parsers: Introduction to Bottom Up parsing, shift reduceparser,LR Parsers, Canonical collection of LR(0) items, construction of SLR parsing tables, Construction of canonical LR(0) parsing tables, Construction of LALR parsing tables, Comparison of SLR,LALR and CALR parsers, Comparison of Top down and Bottom up parsers.

Unit IV:

Syntax Directed Translation: Syntax Directed Translation schemes, Intermediate codes, Postfix notation, Three Address code, Quadruples and triples.

Run-Time Environments: Storage allocation strategies, Stack allocation of space, Access to non-local names.**Symbol table:** Contents of Symbol table, Data Structures for symbol tables, representing scope information

Unit V:

Code Optimization: Principal sources of optimization, Loop optimization, Copy Propagation, Dead code elimination, Redundant sub expression elimination.

Code Generation: Object programs, problems in Code generation, A Machine Model, A Simple Code generator, Register allocation and assignment, Peephole optimization.

Text Book:

1. Alfred V Aho, Jeffrey D Ullman, Principles of Compiler Design, Pearson Education, 2001.

Reference Books:

1. J P Trembly and P G Sorenson, The Theory and practice of Compiler Writing, McGraw Hill, 2005.
2. Alfred V Aho, Ravi sethi, Jeffrey D Ullman, Compilers-Principles, Techniques and Tools, Pearson Education, second edition.
3. Dick Grone, Henri E Bal, Ceriel J H Jacobs, Modern Compiler Design, Wiley Dreamtech, 2006.

DATA WAREHOUSING & DATA MINING

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamentals of Data warehousing and OLAP technology.
2. Outline the Data Mining and Data pre-processing techniques.
3. Identify the frequent patterns using association algorithms.
4. Distinguish how classification algorithms are used on data sets.
5. Compare different clustering techniques on large data sets.

UNIT – I:

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data ware housing to data mining.

UNIT – II:

Introduction to Data Mining: What motivated data mining? Why it is important? So- What is Data mining, Data Mining-On What Kind of Data, Data Mining Functionalities-What kind of patterns can be Mined, Are All of the patterns Interesting, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data warehouse system, Major issues in Data mining.

Data pre-processing:-Why Preprocess the Data, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT – III:

Mining Frequent Patterns, Associations and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV:

Classification & Prediction: What is Classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back Propagation, Support Vector Machines, Associative Classification: Classification by Association Rule Analysis, Lazy Learners, Other Classification Methods, Prediction, Evaluating the Accuracy of a Classifier or Predictor.

UNIT – V:

Cluster Analysis: What is Cluster Analysis, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

Text Books:

1. Data Mining- Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei Morgan Kaufmann publishers 2nd edition.
2. Introduction to Data Mining Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

References:

1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing in the Real World Sam Aanhory& Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.
4. Data Warehousing Fundamentals – PaulrajPonnaiah Wiley student Edition.

ARTIFICIAL INTELLIGENCE

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understanding the evolution and present status of AI
2. Understanding different algorithms of AI
3. Understanding different AI techniques like HMM and Reinforcement Learning
4. Able to apply the basic concepts of AI in real life.

Unit – I:

Concept of AI, History, Current Status, Scope, Intelligent Agents, Environments, Problem Formulations, Review of Tree and Graph Structures, State Space Representation, Search Graph and Search Tree.

Unit – II:

Uninformed and Informed Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search: Generate & Test, Hill Climbing, Best first search, A* algorithm, Game Search, Alpha-Beta Pruning Genetic Algorithm

Unit – III:

Probabilistic Reasoning : Probability, Conditional Probability, Bayes Rule, Bayesian Networks- Representation, Construction and Inference, Temporal Model, Hidden Markov Model, Dynamic Bayesian networks (DBN), Natural Language Processing using HMM

Unit – IV:

Markov Decision Process, MDP Formulation, Utility Theory, Utility Functions, Value Iteration, Policy Iteration and Partially Observable MDPs.

Unit – V:

Reinforcement Learning: Passive Reinforcement Learning, Direct Utility Estimation, Adaptive dynamic Programming, Temporal Difference Learning, Active Reinforcement Learning- Q Learning.

Text Books:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 3rd Edition, Prentice Hall
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill.

Reference Books:

1. Trivedi, M.C., "A Classical Approach to Artificial Intelligence", Khanna Publishing House, Delhi.
2. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011.

OBJECT ORIENTED ANALYSIS & DESIGN
(Professional Elective-2)

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand Object Oriented Software Development Process
2. Construct class and object diagrams for the given scenario
3. Model interaction diagrams, usecase diagrams and activity diagrams for a given project
4. Design State diagrams involving processes and threads
5. Apply the concept of architectural design for deploying the code for software

UNIT– I:

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture and Software Development Life Cycle.

UNIT– II:

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Packages.
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT– III:

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT– IV:

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT– V:

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.
Case Study: The Unified library application, ATM System.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS:

1. Analysis & Design and Unified Process, Craig Larman, Pearson Education.
2. Object Oriented Analysis, Design and Implementation,B.Dathan. S.Ramnath, Universities Press.
3. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

INFORMATION SECURITY
(Professional Elective-2)

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Identify various Security Attacks.
2. Understand various Encryption Principles and algorithms.
3. Implement Cryptography algorithms.
4. Understand various Security Associations and Key Management.
5. Design a Firewall for Security.

UNIT - I:

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT – II:

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT – III:

Public key cryptography principles; public key cryptography algorithms; digital signatures, digital Certificates; Certificate Authority and key management Kerberos, X.509; Directory Authentication Service; Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT – IV:

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT – V:

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn IdoDubrawsky, Steve W. Manzuik and Ryan Permeh, wileyDreamtech.

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH.
6. Introduction to Cryptography, Buchmann, Springer

SOFTWARE TESTING METHODOLOGIES
(Professional Elective-2)

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to

1. Understand the purpose of Software testing.
2. Discuss various testing techniques and able to prepare the test cases for specific requirements.
3. Understand transaction and data flow testing.
4. Construct the test plans and validate the test plan.
5. Understand the testing policies and standards.

UNIT - I:

Testing as an Engineering Activity, Role of Process in Software Quality, Testing as a Process, Basic Definitions, Software Testing Principles, The Tester's Role in a Software Development Organization, Consequences of bugs and taxonomy of bugs, Levels of Testing.

UNIT-II:

Test Case Design Strategies, Using Black Box Approach to Test Case Design: Requirements based testing, positive and negative testing, Boundary Value Analysis, Logic based Testing, Equivalence Class Partitioning, State-transition testing, Domain Testing, Using White Box Approach to Test design: code functional testing, Coverage and Control Flow Graphs, Covering Code Logic, Paths and their Role in White–box Based Test Design.

UNIT – III:

Transaction Flow Testing: Transaction flows, Transaction flow testing techniques. Data Flow Testing: Basics of Data flow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-IV:

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

UNIT-V:

Test Automation: Skills needed for automation, scope of automation, designand architecture for automation, requirements for a test tool, challenges in automation, Test metrics and measurements, project, progress and productivity metrics.

TEXT BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing Principles and Practices", Pearson education, 2006.
2. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech, 2003

REFERENCE BOOKS:

1. Ilene Burstein, "Practical Software Testing" , Springer International Edition, 2003
2. Aditya P.Mathur, "Foundations of Software Testing", Pearson Education, 2008.
3. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 2003.
4. RenuRajani, Pradeep Oak, "Software Testing Effective Methods, Tools and Techniques", Tata McGraw Hill, 2004.

PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective-2)

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the importance of programming paradigms.
2. Illustrate the syntax and semantics in formal notation.
3. Make use of expressions and statements for subprograms and blocks.
4. Select different object oriented concepts for solving a given problem.
5. Compare the features of different programming languages.

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation Compilation and Virtual Machines, programming environments

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotation semantics and axiomatic semantics for common programming language features.

Names, Bindings, Data types: Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT III:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements and guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Concepts of ProgrammingLanguagesRobert.W. Sebesta,TenthEdition,Pearson Education.

REFERENCE BOOKS:

1. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.
4. Programming in Prolog, W. F. Clocksin& C. S. Mellish, 5th Edition, Springer.
5. Programming Python, M. Lutz, 3rd Edition, O'reilly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michel Dawson, Thomson, 2008

DATA MINING & CASE TOOLS LAB

L	T	P	C
0	0	2	1

B. Tech. III Year II Semester

Course outcomes:

At the end of the course, student will be able to:

1. Demonstrate frequent pattern algorithms
2. Explore Weka environment
3. Apply data mining techniques for realistic data
4. Design various UML diagrams for ATM allpication
5. Design Unified Library application
6. Explore real time applications

Data Mining Lab

Week-1: Demonstrate Apriori based Association Rule Mining
Week-2: Demonstrate FP growth based Association Rule Mining
Week-3: Weather classification using WEKA Tool
Week-4: Demonstrate K-means based Clustering
Week-5: Demonstrate Hierarchical Clustering
Week-6: Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

Case Tools Lab

Week 1 & Week 2:

Draw the following diagrams using UML for an ATM system whose description is given below. UML diagrams to be developed are:

1. Use Case Diagram
2. Class Diagram
3. Sequence Diagram
4. Collaboration Diagram
5. State Diagram
6. Activity Diagram
7. Component Diagram
8. Deployment Diagram

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in

multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the ma-chine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.).

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.

2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.

3. A customer must be able to make a transfer of money between any two accounts linked to the card.

4. A customer must be able to make a balance inquiry of any account linked to the card.

5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction. The ATM will provide the customer with a printed receipt for each successful transaction.

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit enve-lopes and reload the machine with cash, blank receipts, etc.

Week 3 & Week 4:

The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

Week 5 & Week 6:

Student has to take up another case study of his/her own interest and do the same whatever mentioned in first problem.

ADVANCED COMMUNICATION SKILLS (ACS) LAB

B. Tech. III Year II Semester

L	T	P	C
0	0	2	1

Course Outcomes:

1. Develop sound communication skills in various situations with the help of enriched vocabulary.
2. Practice reading techniques for a faster and better comprehension.
3. Exhibit strong writing skills to express ideas effectively.
4. Demonstrate effective presentation skills.
5. Use appropriate verbal and non-verbal skills for a successful career.

UNIT-I:

Activities on Fundamentals of inter-personal Communication and Building Vocabulary – Starting a conversation responding appropriately and relevantly using the right body language Role Play in different situations & Discourse Skills using visuals Synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.

UNIT-II:

Activities on Reading Comprehension General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.

UNIT-III:

Activities on Writing Skills – Structure and presentation of different types of writing – letter writing/ Resume writing/ Statement of purpose - E-correspondence/ Technical report writing / Portfolio writing – planning for writing – improving one's writing.

UNIT-IV:

Activities on Presentation Skills – Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/e-mails/assignments etc.

UNIT-V:

Activities on Group Discussion and interview Skills Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation. Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video conference and Mock Interviews.

REFERENCE BOOKS:

1. Technical Communication by Meenakshi Raman &Sangeeta Sharma, Oxford University, 2nd Edition, 2011.
2. Functional English for Success, Orient Longman, 2014.

PERSONALITY DEVELOPMENT AND BEHAVIORAL SKILLS

B. Tech. III Year II Semester

L	T	P	C
2	0	0	1

Course Outcomes:

1. Practice optimistic attitude for an efficient, socially viable and multi-faceted personality.
2. Demonstrate functions of non-verbal ***communication in formal context***.
3. Build effective individual & team dynamics for professional accomplishments.
4. Analyze appropriate strategic Interpersonal Skills for productive workplace relationships.
5. Correspond in multiple contexts, for varied audiences, across genres and modalities.

Unit – I:

Personality Development:

Definition - Various Aspects of Personality Development - Behavioural Traits.

Importance of Soft Skills for personal and professional development - Success stories.

Unit – II:

Non Verbal Communication:

Kinesics, Haptics, Proxemics, Vocalics, Oculesics

Body Language informal contexts such as Group Discussions, Presentations and Interviews.

Unit – III:

Team Dynamics:

Different Types of Teams Role of an individual communicating as a group or team leader

Individual Presentations/Team Presentation-Project Presentations- Case Studies

UNIT-IV:

Interpersonal Skills:

Time Management- Stress Management- Emotional Intelligence- Conflict Management- Relationship Management

UNIT-V:

Digital Correspondence:

Role of Multimedia in Communication Communication in a Digital Edge (Video Conference Etc.)

Social Networking: Importance and Effects.

TEXT BOOK:

1. Personality Development and Soft Skills, Preparing for Tomorrow, Shikha Kapoor 2nd Edition, 2020.

REFERENCE BOOKS:

1. Barun, K Mitra, Personality Development and Soft Skills, Oxford University Press, 2nd Edition, 2016.
2. Professional Ethics.R Subramanian, Oxford University Press, 2ndEdition, 2015.

COURSE STRUCTURE FOR B.TECH IV YEAR

B. Tech. IV Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -3	Big Data Analytics Internet of Things R Programming Image Processing	3	0	0	3
4	PE-4	Advanced Databases Block-Chain Technologies Information Retrieval Systems Machine Learning	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Image Processing Lab	0	0	2	1
8	PW	Mini Project	0	0	6	3
Total			**18**	**0**	**10**	**20**

B. Tech. IV Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-18	E-Commerce	3	0	0	3
2	PC-19	Semantic Web and Social Networks	3	0	0	3
3	PW	Technical Seminar	0	0	4	2
4	PW	Comprehensive Viva Voce	0	0	4	2
5	PW	Major Project	0	0	20	10
		Total	**6**	**0**	**28**	**20**

MOBILE APPLICATION DEVELOPMENT

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to:

1. Understand the basics of Android devices and Platform.
2. Acquire knowledge on basic building blocks of Android programming required for App development.
3. Understand persistence Data storage mechanism in Android
4. Understand advanced application concepts like networking, Animations and Google Maps services etc.
5. Develop and publish Android applications in to Android Market

UNIT I:

JAVA FX TECHNOLOGY FOR RICH CLIENT APPLICATIONS

Introduction: Introduction to mobile application development, trends, introduction to various platforms, introduction to smart phones.

Android platform: Android platform features and architecture, versions, comparison added features in each versions,ART (Android Runtime), ADB (Android Debug Bridge).

Development environment/IDE: Android studio and its working environment, gradle build system, emulator setup.

Application anatomy: Application framework basics: resources, layout, values, asset XML representation and generated R.Javafile, Android manifest file,creating a simple application.

UNIT II:

ANDROID UI DESIGN

GUI for Android: Introduction to activities, activities life-cycle, Android v7 support library form API21 for lower version support.

Intent: intent object, intent filters, adding categories, linking activities, user interface design components.

Views and View Groups: Basic views, picker views, adapter views, Menu, App Bar etc, basics of screen design; different layouts. App widgets.

Lollipop Material design: new themes, new widgets, Card layouts. Recycler View **Fragments**: Introduction to activities, activities life-cycle.

UNIT III:

DATA PERSISTENCE

Different Data persistence schemes: Shared preferences, File Handling, Managing data using SQLite database

Content providers: User content provider, Android in build content providers.

UNIT IV:

BACK GROUND RUNNING PROCESS, NETWORKING AND TELEPHONY SERVICES

Services: introduction to services – local service, remote service and binding the service, the communication between service and activity, Intent Service.

Multithreading: Handlers, AsyncTask

Android network programming: HttpUrlConnection, Connecting to REST-based and SOAP based Web services

Broad cast receivers: LocalBroadcastManager, Dynamic broadcast receiver, System Broadcast. Pending Intent, Notifications

Telephony Manager: Sending SMS and making calls.

UNIT V:
ADVANCED APPLICATIONS
Location based services: Google maps V2 services using Google API,
Animations and Graphics: Property Animation, View Animations, Drawable Animations
Media and Camera API: Working with video and audio inputs, camera API
Sensor programming: Motion sensors, Position sensors, Environmental sensors.
Publishing Android Apps: Guide lines, policies and process of uploading Apps to Google play.

TEXT BOOKS:

1. Dawn Griffiths, David Griffiths,*"Head First: Android Development" ,OReilly2015,ISBN*: 9781449362188
2. J.F.DiMarzio's, "Android 4 Application Development"

REFERENCE BOOKS:

1. Greg Milette,Adam Stroud,"PROFESSIONALAndroid™ Sensor Programming", John Wiley and Sons, Inc2012,ISBN/978111265055,9781280678943,978111227459
2. Paul Deital,HarveyDeital, Alexander Wald, "Android 6 for Programmers ,App Driven approach",2015, Prentice Hall ,*ISBN*: 9780134289366.

CLOUD COMPUTING

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to:

1. Understand different Cloud Services
2. Analyze different cloud deploy and service models.
3. Understand various enterprise applications in cloud computing
4. Understand and apply the virtualization concepts
5. Understand the data security mechanism and SLA management in cloud.

UNIT -I:

Introduction to cloud computing: Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenge and Risks.

UNIT - II:

Migration into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, the Seven-Step Model of Migration in to a Cloud.

Enriching the 'Integration as a Service' Paradigm for the Cloud Era: An Introduction, The Onset of Knowledge Era, The Evolution of SaaS, The challenges of SaaS Paradigm, Approaching the SaaS integration enigma, new integration scenarios, the integration. Methodologies, Saas integration products and platforms, SaaS Integration Services, Business to Business Integration (B2Bi) Services.

UNIT III:

The Enterprise Cloud Computing Paradigm: Introduction, Background, Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers toward a Marketplace for Enterprise Cloud Computing, the Cloud Supply Chain.

UNIT IV:

Virtual Machines Provisioning and Migration Services: Introduction and Inspiration, Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Future Research Directions.

Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing, Open Questions and Challenges.

UNIT V:

SLA Management in Cloud Computing: A Service Provider's Perspective: Inspiration, Traditional Approaches to SLO Management, Types of SLA, Life Cycle of SLA, SLA Management in Cloud, Automated Policy based Management.

Data Security in the Cloud: An Introduction to the idea of Data Security, The Current State of Data Security in the Cloud, Homo Sapiens and Digital Information, Cloud Computing and Data Security Risk, Cloud Computing and Identity, Digital Identity and Data Security, Content Level Security-Pros and Cons.

TEXT BOOK:

1. Rajkumar Buyya, James Broberg, AndrZejGoscinski, Cloud Computing Principles and Paradigms, Wiley Publications.

REFERENCE BOOKS:

1. Michael Miller, Cloud Computing Web-Based Application That Change the Way You Work and Collaborate Online, Pearson Publications.
2. Thomas Erl, Zaigham Mahmood, & Ricardo Puttini, Cloud ComputingConcepts, Technology & Architecture Pearson Publications.
3. Kai Hwang, Geoffrey C.Fox. Jack J. Dongarra, Distributed and Cloud Computing From Parallel Processing to the Internet of Things, ELSEVIER Publications.

BIG DATA ANALYTICS
(Professional Elective - 3)

L	T	P	C
3	0	0	3

B. Tech. IV Year I Semester

Course Outcomes:

At the end of this course, the student would be able to:

1. Explain the foundations, definitions, and challenges of Big Data.
2. Use Hadoop file system interfaces.
3. Program using HADOOP and Map reduce.
4. Understand various Hadoop Eco Systems like Pig, Hive.
5. Outline Hadoop Eco System using HBase, Zookeeper.

UNIT-I:

Introduction to Big Data and Hadoop

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analyzing Data with UNIX tools, Analyzing Data with Hadoop, Hadoop Streaming, Hadoop Echo System.

UNIT-II:

HDFS (Hadoop Distributed File System)

The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT-III:

Map Reduce

Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

UNIT-IV:

Hadoop Eco System-I

Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

UNIT-V:

Hadoop Eco System-II

HBase: HBasics, Concepts, Clients, Example, Hbase versus RDBMS.

Zookeeper: The Zookeeper Services, Zookeeper in Production.

TEXT BOOK:

1. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reily Media, 2012.

REFERENCE BOOKS:

1. Seema Acharya, SubhasiniChellappan, "Big Data Analytics" Wiley 2015. References
2. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
3. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013).
4. Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.
5. Anand Rajaraman and Jefrey David Ulman, "Mining of Massive Datasets", Cambridge University Press, 2012.
6. Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

INTERNET OF THINGS (IoT)
(Professional Elective - 3)

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to:

1. Describe various IoT enabled technologies.
2. Understand the concepts of M2M with necessary protocols.
3. Illustrate Python programming for IoT
4. Examine the Python programming with Raspberry PI
5. Design web applications for IoT

UNIT I:

Introduction to Internet of Things Definition and Characteristics of IoT, Physical Design of IoT IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT II:

IoT and M2M Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPPER.

UNIT III:

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT IV:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT V:

IoT Physical Servers and Cloud Offerings Introduction to Cloud Storage models and communication APIs. Web server Web server for IoT, Cloud for IoT, Python web application framework designing a RESTful web API.

Case study: Amazon web services for IoT.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.

REFERENCE BOOKS:

1. Getting started with the Internet of Things: connecting sensors and micro controllers to the cloud CUNO Pfister, O' Reily publications.

R PROGRAMMING
(PROFESSIONAL ELECTIVE–3)

L	T	P	C
3	0	0	3

B. Tech. IV Year I Semester

Course Outcomes:

At the end of this course, the student would be able to:

1. Apply operations on basic data types using R
2. Apply various operators on data frames, factors and list
3. Develop functions using iterative programming for real world problems
4. Analyze the data by plotting using R
5. Formulate linear and multiple regression models for time series data & web data

Unit – I:

Basics of R: Introduction, R-Environment Setup, Programming with R, Basic Data Types, Vectors:Creating and Naming Vectors, Vector Arithmetic, Vector Subsetting, Matrices: Creating and Naming Matrices, Matrix Subsetting, Arrays, Class.

Unit – II:

Factors and Data Frames : Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, Subsetting of Data Frames, Extending Data Frames, Sorting Data Frames,

Lists: Introduction, Creating a List: Creating a Named List, Accessing List Elements, Manipulating List Elements, Merging Lists, Converting Lists to Vectors, Conditionals and Control Flow: Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators and Vectors, Conditional Statements.

Unit – III:

Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.

Functions in R: Introduction, Writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functions in R, Cumulative Sums and Products, Calculus in R, Input and Output Operations.

Unit – IV:

Apply Family in R : Introduction, Using Apply in R, Using Lapply in R, Using Sapply, Using Tapply in R: Split Function, Using Mapply in R, Charts and Graphs : Introduction, Pie Chart: Chart Legend, 3D Pie Chart, Bar Chart, Box Plot, Histogram, Line Graph: Multiple Lines in Line Graph, Scatter Plot.

Unit-V:

Data Interfaces: Introduction, CSV Files: Syntax, Importing a CSV File, Excel Files: Syntax, Importing an Excel file, Binary Files: Syntax, XML Files, Web Data, Databases.

Statistical Applications: Introduction, Basic Statistical Operations, Linear Regression Analysis, Chi-Squared Goodness of Fit Test, Chi-Squared Test of Independence, Multiple Regression, Time Series Analysis.

TEXT BOOK:

1. K G Srinivas, G M Siddesh "Statistical programming in R", Oxford Publications.

REFERENCE BOOKS:

1. K Beginning R: The Statistical Programming Language, Mark Gardener,Wrox
2. Y. anchangZhao, R and Data Mining: Examples and Case Studies. Elsevier in December 2012.
3. Avril Coghlan, A Little Book of R For Time Series, Release 0.2.

IMAGE PROCESSING
(Professional Elective - 3)

L	T	P	C
3	0	0	3

B. Tech. IV Year I Semester

Course Outcomes:

After completion of the course, student would be able to:

1. Understand Digital image fundamentals,
2. Program Image Transformations,
3. Design Color Image Processing and Restoration,
4. Implement Image segmentation techniques and
5. Program Image Compression techniques.

UNIT-I:

Digital image fundamentals - Digital Image through scanner, digital camera. Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry.

UNIT-II:

Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform. Image enhancement Point processing. Histogram processing. Spatial filtering.

UNIT-III:

Enhancement in frequency domain, Image smoothing, Image sharpening. Color image processing: Pseudo color image processing, full color image processing.
Image Restoration Degradation model, Algebraic approach to restoration, Inverse filtering, least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV:

Image segmentation Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

UNIT-V:

Image compression Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

TEXT BOOKS:

1 Digital Image processing R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education.

REFERENCE BOOKS:

1 Image Processing with Scilab and Image Processing Design Toolbox; Dr. Eng. (J) Harald Galda, 2011.
2 Fundamentals of Digital Image processing A.K.Jain, PHI.
3 Digital Image processing using MAT LAB Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
4 Digital Image Processing William K. Pratt, John Wilely, 3rd Edition, 2004.

ADVANCED DATABASES
(Professional Elective - 4)

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the concepts of Distributed Database Systems.
2. Identify different Architectural Models for Distributed DBMS.
3. Characterize the query processors.
4. Design Algorithms for Concurrency control Mechanisms.
5. Decide different Parallel DBMS Techniques based on given constraints.

UNIT-I:

Introduction

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Design Issues.

UNIT-II:

Distributed DBMS Architecture: ANSI SPARC, Centralized DBMS Architecture, Architectural Models for Distributed DBMS.

Distributed Database Design: Top-Down Design Process, Distribution Design issues, Fragmentation, Allocation.

UNIT-III:

Introduction to RDBMS: Overview of Relational DBMS: Relational Database Concepts, Normalization, And Relational Data Languages.

Query Processing and Decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT–IV:

Distributed Query Optimization: Query optimization, centralized query optimization, Distributed query optimization algorithms.

Transaction Management: Definition, properties of transaction; types of transactions.

UNIT-V:

Distributed Concurrency Control: Serializability theory, Concurrency control Mechanisms & Algorithms; Time stamped & Optimistic concurrency control algorithms, Deadlock Management, Relaxed Concurrency Control.

TEXT BOOKS:

1. Distributed Databases Stefano Ceri and WillipsePelagatti:, McGraw Hill.
2. Principles of Distributed Database Systems, M.TamerOzsu, Patrick Valduriez, 3rd Edition, Springer.

REFERENCE BOOKS:

1 M.Tamer OZSU and PauckValduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.

2 Henry F Korth, aSilberchatz and Sudershan: Database System Concepts. Tata MGH.

3 Raghuramakrishnan and JohhanesGehrke: Database Management Systems, MGH

BLOCKCHAIN TECHNOLOGIES
(Professional Elective - 4)

L	T	P	C
3	0	0	3

B. Tech. IV Year I Semester

Course Outcomes:

At the end of the course student would be able to

1. Understand the Cryptography, and Block Chain.
2. Discuss about Generic elements of blockchain.
3. Demonstrate various methods and routes of Decentralization.
4. Analyze the concepts of Bitcoin.
5. Apply Block chain in Real time scenario.

Unit I:

Introduction to Cryptography and Blockchain: Symmetric Cryptography, Stream Ciphers, Block Ciphers, Hash functions: Design of SHA-256, Merkle trees, Patricia trees, Distributed hash tables, Digital signatures. The Growth of Block Chain Technology: Electronic cash, Block Chain

Unit II:

Generic Elements of Blockchain, Blockchain working and Accumulation blocks, Benefits and Limitations of blockchain, Tiers of blockchain technology, Features of blockchain, Types of block chain, Consensus, CAP Theorem and block chain.

Unit-III:

Decentralization: Decentralization using block chain, Methods of Decentralization, Routes to Decentralization, Block chain and full Ecosystem Decentralization, Smart Contracts, Platforms for Decentralization.

Unit IV:

Introducing Bitcoin: Digital keys and addresses, Transactions, Block Chain, Mining, The Bitcoin Network.

Unit V:

Ethereum blockchain, The Ethereum Network, Components of Ethereum Ecosystem.
Current Landscape and what'snext: Emerging trends, Blockchain Research.

TEXT BOOKS:

1. Imran Bashir, Mastering Block chain, Packt Publishing, 2018.
2. VikramDhillon, DavidMetcalf, MaxHooper, BlockchainEnabledApplications, Apress, 2017.

REFERENCE BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

INFORMATION RETRIEVAL SYSTEMS
(Professional Elective - 4)

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes

1. Understand the concepts of information system models
2. Ability to use various retrieval utilities for improving search
3. Analyze the crossing language barrier and learn about crossing language information retrieval.
4. Evaluate indexing and compressing documents to improve space and time efficiency.
5. Understand issues in web search, structured and unstructured data.

UNIT-I:

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Retrieval Strategies: Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model, Language Models.

UNIT-II:

Retrieval Utilities: Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri.

UNIT-III:

Retrieval Utilities: Semantic networks, Parsing Cross-Language Information Retrieval: Introduction, Crossing the language barrier.

UNIT-IV:

Efficiency: Inverted index, Query processing, Signature files, Duplicate document detection.

UNIT-V:

Integrating Structured Data and Text: A Historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema

Distributed information Retrieval: A Theoretical model of distributed retrieval Web search.

TEXT BOOK:

1. David A. Grossman, Ophir Frieder, information Retrieval Algorithms and Heuristics, Springer, 2nd Edition (Distributed by Universities Press), 2004.

REFERENCE BOOKS:

1. Gerald J Kowaiski, Mark T Maybury. Information Storage and Retrieval Systems, Springer, 2000
2. Soumen Chakrabarti, Mining the Web : Discovering Knowledge from Hypertext Data, MorganKaufrnann Publishers, 2002
3. Christopher D.Manning, Prabhakar Raghavan, HinñchSchütze, An Introduction to Information Retrieval, Cambridge University Press, Cambridge, England, 2009

MACHINE LEARNING
(Professional Elective - 4)

B. Tech. IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of this course, the student would be able to:

1. Ability to understand the basic concepts such as Decision trees and Neural Networks.
2. Analyze various Machine Learning techniques and their efficiency.
3. Apply Machine Learning algorithms to solve problems of moderate complexity.
4. Understand Genetic algorithms and their applications.
5. Identify ML Applications.

Unit – I:

Introduction and Concept Learning: An illustrative learning task, A few approaches of learning task, what is known from algorithms? Theory, Experiment, Biology and Psychology, Introduction to Concept Learning, Version Space, Inductive Bias, Active Queries, Mistake Bound/PAC Model, Basic Results, Overview of issues regarding data sources, Success Criteria

Unit II:

Decision Tree learning and Neural Network learning: Introduction to Decision Tree Learning, Minimum Description Length Principle, Occam's razor, learning with active queries, Introduction to Neural Network Learning, Introduction to Perceptions, Perceptions, Introduction to Gradient Descent and Back propagation.

Unit III:

Sample Complexity and Over fitting And Bayesian Approaches: Introduction to Sample Complexity and Over fitting, Errors in estimating means, Cross Validation and Jackknifing VC Dimension, Irrelevant features , Multiplicative rules for Weight tuning, Introduction to Bayesian Approaches, The basics Expectation Maximization, Hidden Markov Models

Unit – IV:

Instance-based Techniques: Introduction to Instance-based Techniques, Lazy vs. eager generalization, K nearest neighbor, Case-based reasoning

Unit – V:

Genetic Algorithms: Different search methods for induction, Explanation based Learning, Using prior knowledge to reduce sample complexity

TEXT BOOKS:

1. Machine Learning - Mc Graw Hill, Tom M. Mitchell.
2. Trevor Hus tie, Robert Tibshirani& Jerome Friedman. The Elements of Statically Learning, Springer Veriag 2001.

REFERENCE BOOKS:

1. Machine Learning Methods en the Environmental Science, Neural Network, William W Hsieh Cambridge UniversityPress.
2. Rbchard o Duda, Peter E. Hart and David G. Stork, & pattern Classification,.John Wiley & Sons Inc,2001
3. Chris Bishop, Neural Network for, Pattern Recognition, Oxford University Press. 1995.

MOBILE APPLICATION DEVELOPMENT LAB

B. Tech. IV Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

At the end of this course, the student would be able to:

1. Ability to develop GUI based android applications.
2. Ability to develop event based android applications.
3. Design android applications that can access database.

LIST OF EXPERIMENTS

Week 1: Installation and configuration of Android Studio

Week 2: Develop an application that uses GUI components to display a "Hello World" message and change its color and font size.

Week 3: Develop an application that receives user's name, contact and city and displays the same using Layout Managers and Event Listeners.

Week 4: Create a native calculator application.

Week 5: Design an application that draws basic graphical primitives: line, circle, square, rectangle etc., on the screen.

Week 6: Develop a Registration and Login application that makes use of database.

Week 7: Develop an application that makes use of RSS Feed.

Week 8: Create an application that implements Multi threading.

Week 9: Develop a native application that uses GPS location information.

Week 10: Implement an application that writes data to the SD card.

Week 11: Develop an application that creates notification upon receiving a message.

Week 12: Create an alarm clock mobile application.

BIG DATA ANALYTICS LAB
(Professional Elective – 3 Lab)

L	T	P	C
0	0	2	1

B. Tech. IV Year I Semester

Course Outcomes:

At the end of this course, the student would be able to:

1. To introduce the tools required to manage and analyze big data like Hadoop, NoSql
2. To impart knowledge of map reduce paradigm to solve complex problems Map-Reduce
3. To introduce several new algorithms for big data mining like classification, clustering and finding frequent patterns.

LIST OF EXPERIMENTS

Week 1, 2:

1. Implement the following Data structures in Java
   a) Linked Lists b) Stacks c) Queues d) Set e) Map

Week 3

2. Perform setting up and Installing Hadoop in Pseudo distributed mode.

Week 4:

3. Implement the following file management tasks in Hadoop:
   i. Adding files and directories
   ii. Retrieving files
   iii. Deleting files

Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

Week 5:

4. Run a basic Word Count Map Reduce program to understand Map-Reduce Paradigm.

Week 6:

5. Write a Map Reduce program that mines weather data.

Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with Map-Reduce, since it is semi structured and record-oriented.

Week 7:

6. Implement Matrix Multiplication with Hadoop Map Reduce

Week 8, 9:

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your Data.

Week 10, 11:

8. i) Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, Functions and indexes

ii) Performance techniques in Hive partitions, bucketing.

Week 12:

9. Migration from Mysql database to hive using Sqoop.

INTERNET OF THINGS LAB
(Professional Elective – 3 Lab)

L	T	P	C
0	0	2	1

B. Tech. IV Year I Semester

Course outcomes:

At the end of this course, the student would be able to:

1. Apply the concepts of IoT by identifying different related technologies.
2. Apply IoT to different applications by evaluating IoT protocols.
3. Design and develop smart IoT solutions by analyzing the data received from sensors.

List of Experiments

Week 1:

1. Introduction to Arduino Uno – Sensors & Actuators
    a. Temperature & Humidity Sensors
    b. Air Quality Sensor
    c. PIR Motion Sensor
    d. Micro Servo Motor
    e. Stepper Motor
    f. 100RPM Motor

Week 2:

2. Introduction to NodeMCU – Sensors & Actuators
    a. Temperature & Humidity Sensors
    b. Air Quality Sensor
    c. PIR Motion Sensor
    d. Micro Servo Motor
    e. Stepper Motor
    f. 100RPM Motor

Week 3:

3. Setting up your Raspberry Pi. Installation of software.
4. Introduction to Raspberry Pi – Sensors & Actuators
    a. Temperature & Humidity Sensor
    b. Ultrasonic Sensor
    c. Micro Servo Motor

Week 4:

5. Introduction to IoT & Sensor control with IFTTT.

Week 5:

6. Build a Web-App: Blinking an LED over Internet.
7. Build a Web-App: Control a motor over Internet when motion is detected.

Week 6:

8. Live Temperature and Humidity monitoring over Internet.

Week 7:

9. Introduction to Open Source Cloud Platforms for IoT: OpenIoT, ThingSpeak.

Week 8:

10. Open Source Cloud Platforms for IoT: thinger.io, Google Cloud Platform.

Week 9 & 10:

11. Introduction to Open Web Services for IoT
12. Experiments with Open Web Services for IoT:
    a. M2M Labs
    b. The Thing Box
    c. The Thing System
    d. Node-RED

Week 11:

13. Home Automation System.

Week 12:

14. Build a Restful web service for IoT Management.

Week 13:

15. Build a web server for IoT Management

R PROGRAMMING LAB
(Professional Elective – 3 Lab)

L	T	P	C
0	0	2	1

B. Tech. IV Year I Semester

Course outcomes:

At the end of this course, the student would be able to:

1. Explore R environment
2. Visualize data insights using charts and graphs
3. Analysis data with linear regression model

Week-1:

Installation and Environment set up R and Rstudio

Week-2:

Experiments on Vector Arithmetic operations

Week-3:

Experiments on Matrices operations

Week-4

Experiments on Arrays functions

Week-5:

Experiments on Factors

Week-6:

Experiments on Data Frames

Week-7:

Experiments on List operations

Week-8:

Write R scripts which demonstrate logical operations and Conditional Statements

Week-9:

Write R scripts which demonstrate Looping over List

Week-10:

Write R scripts which demonstrate Nested Functions and Function Scoping

Week-11:

Experiments on Mathematical Functions in R

Week-12:

Experiments on Calculus in R

Week13:

Experiments on Lapply, Sapply and Apply functions

Week-14:

Generate different Charts and Graphs using R.

IMAGE PROCESSING LAB
(Professional Elective - 3 Lab)

B. Tech. IV Year I Semester

L	T	P	C
0	0	2	1

List of Experiments:

1. Display of Grayscale Images.
2. Histogram Equalization.
3. Non-linear Filtering.
4. Edge detection using Operators.
5. 2-D DFT and DCT.
6. Filtering in frequency domain.
7. Display of color images.
8. Conversion between color spaces.
9. DWT of images.
10. Segmentation using watershed transform.

MINI PROJECT

IV Year B.Tech. CSE – I Semester

L	T	P	C
0	0	0	3

E – COMMERCE

L	T	P	C
3	0	0	3

B. Tech. IV Year II Semester

Course Outcomes:

At the end of this course, the student would be able to:

1. Identify the anatomy of E-Commerce applications and its process models.
2. Categorize different Electronic payment systems.
3. Examine Supply chain Management.
4. Analyze the various marketing strategies for an online business.
5. Design strategies for E-Commerce Catalogues.

UNIT-I:

Electronic Commerce

Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications and E-Commerce organization applications, Consumer Oriented Electronic commerce, Mercantile Process models.

UNIT-II:

Electronic Payment Systems

Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce EDI, EDI Implementation, Value added networks.

UNIT-III:

Intra Organizational Commerce work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT-IV:

Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing – Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-V:

Consumer Search and Resource Discovery

Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK:

1. Frontiers of electronic commerce Kalakata, Whinston, Pearson.

REFERENCE BOOKS:

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.JaiswalGalgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce Gary P.Schneider Thomson.

SEMANTIC WEB AND SOCIAL NETWORKS

L	T	P	C
3	0	0	3

B. Tech. IV Year II Semester

Course Outcomes:

At the end of this course, the student would be able to:

1. Identify the Structure of the Semantic Web Technology in reference with the World Wide Web.
2. Design the concepts of Resource Description Framework, Ontology and Web Ontology Language(OWL).
3. Understand Ontology Engineering Tools and Methods.
4. Apply Logic, Rule and Inference Engines in Semantic Applications.
5. Understand and Analyze Social Networks and design solution for Web based Social Networks like Blogs and Online Communities.

UNIT-I:

Empowering the Information Age: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web.

Turing: What is Machine Intelligence? : Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents.

Berners-Lee: What is Solvable on the Web? : Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II:

Resource Description Framework: HTML Language, XML Language,RDF Language,Basic Elements, RDF Schema.

Web Ontology Language: Ontology Language,Ontology Language Requirements, Compatibility of OWL and RDF/RDFS, The OWL Language, Basic Elements, OWL Example: Compute Ontology,OWL Capabilities and Limitations.

UNIT-III:

Ontology Engineering: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT-IV:

Logic, Rules, Inference & Semantic Web Applications: Logic, Rule and Inference, Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.

Semantic Search Technology: Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods.

UNIT-V:

Social Network Analysis: What is Networks analysis, Development of the social networks analysis.

Electronic sources for network analysis: Electronic Discussion networks. Blogs and Online Communities, Web Based Networks.

Developing social-semantic applications: Building Semantic Web Applications with social network features, Semantic Web Architecture.

TEXT BOOKS:

1. Thinking on the Web Berners Lee, Godel and Turing, Wiley interscience, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Audi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)

TECHNICAL SEMINAR

B. Tech. IV Year II Semester

L	T	P	C
0	0	4	2

COMPREHENSIVE VIVA VOCE

B. Tech. IV Year II Semester

L	T	P	C
0	0	4	2

MAJOR PROJECT

IV Year B.Tech. CSE – II Semester

L	T	P	C
0	0	20	10

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

An Autonomous Institution

Aziznagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

ACADEMIC REGULATIONS & SYLLABI (R15)

for

B.Tech (CSE & IT) First Year

(Applicable for the batches admitted from the Academic Year 2017-2018 onwards)

COMPUTER SCIENCE AND ENGINEERING / INFORMATION TECHNOLOGY

I YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A11001	English-I	2	0	0	2	2	100
A11002	Mathematics - I	4	1	0	3	4	100
A11003	Engineering Physics – I	3	1	0	3	4	100
A11502	C Programming - I	3	1	0	3	4	100
A11004	Engineering Chemistry	3	1	0	3	4	100
A11303	Engineering Graphics	2	0	3	3	5	100
A11081	English Language Communication Skills Lab – I	0	0	3	2	3	75
A11581	C Programming Lab- I	0	0	3	2	3	75
A11083	Engineering Physics and Chemistry Lab	0	0	3	2	3	75
A11583	IT Workshop	0	0	3	2	3	75
	Total	17	07	15	25	35	900

I YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A12005	English-II	2	0	0	2	2	100
A12006	Mathematics – II	4	1	0	3	4	100
A12007	Engineering Physics-II	3	1	0	3	4	100
A12503	C Programming – II	3	1	0	3	4	100
A12009	Mathematics – III	3	1	0	3	4	100
A12203	Basic Electrical Engineering	3	1	0	3	4	100
A12085	English Language Communication Skills Lab – II	0	0	3	2	3	75
A12584	C Programming Lab - II	0	0	3	2	3	75
A12382	Engineering Workshop	0	0	3	2	3	75
	Total	18	5	9	23	31	825

Note: All End Examinations (Theory and Practical) are of three hours duration.

L – Lecture **T – Tutorial** **P – Practical** **D – Drawing**

L T/P/D C
2 0 0 2

ENGLISH-I
(COMMON TO ALL BRANCHES)

MAIN OBJECTIVES:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

B Tech I Year I Semester

Unit-I: 'Wit and Humor' from 'Skills Annexe' -Functional English for Success
Objectives:

- To enable students to develop their listening skills to improve their pronunciation

L-Listening For Sounds, Stress and Intonation

- To make students aware of the role of speaking in English and its contribution to their success.

S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations).

- To develop an awareness in the students about the significance of silent reading for subject and theme.

R- Reading for Subject/ Theme

- To equip the students with the components of different forms of writing

W- Writing Paragraphs

Unit –II: 'Mokshagundam Visvesvaraya' from "Epitome of Wisdom
Objectives:

- To enable the students to use phrasal verbs, expressions, idioms, collocations, pre-fixes and suffixes, and linking words.

G-Types of Nouns and Pronouns
V-Homonyms, homophones synonyms, antonyms

Unit-III: 'Cyber Age' from "Skills Annexe -Functional English for Success
Objectives:

- To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

L – Listening for themes and facts

- To enable students to express themselves fluently and appropriately in social and professional contexts

S -Apologizing, Interrupting, requesting and making polite conversation

- To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

R - For theme and gist

- To equip them with the components of different forms of writing.

W - Describing People, Places, Objectives, Events,

Unit-IV: 'Three Days to See' from "Epitome of Wisdom

Objective:

- To enable the Students to use a wide range of grammatical structures appropriately and accurately in written and spoken English including vocabulary

G- Verb &Verb forms

V- Adjective and Adverb

Unit-V: Human Values & Professional Ethics from "Skills Annexe

Objective:

- To equip the students with the components of different forms of writing..

W- Note-Making, Note-Taking

TEXTBOOKS PRESCRIBED:

For Detailed study:

First Textbook: "*Skills Annexe -Functional English for Success*",

Published by Orient Black Swan, Hyderabad

For Non-detailed study:

Second text book *"Epitome of Wisdom",* Published by Maruthi Publications, Guntur.

MATHEMATICS-I
(CSE & IT)

L	T/P/D	C
4	1/-/-	3

UNIT-I: Matrices and System of Linear Equations

Matrices and Systems of Linear Equations: Real matrices Symmetric, Skew symmetric, Orthogonal, Complex matrices: Hermitian, Skew Hermitian and Unitary Elementary transformations-Rank-Echelon form, Normal form System of Linear equations Direct Methods (Gauss Elimination, Gauss Jordan).

UNIT-II: Eigen Values and Eigen Vectors

Eigen values, Eigen vectors properties, Clayey-Hamilton Theorem (without Proof) Inverse and powers of a matrix by Clayey-Hamilton theorem Diagonolization of matrix. Linear Transformation Orthogonal Transformation, Quadratic forms Nature, Index and Signature.

UNIT-III: Functions of Single Variable and Functions of several variables

Rolle's Theorem Lagrange's Mean Value Theorem Cauchy's mean value Theorem Generalized Mean Value theorem (all theorems without proof) Geometrical interpretation of Mean value theorems. Functions of several variables Partial Differentiation and total differentiation (left as an exercise to student) - Functional dependence-Jacobian Determinant- Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT-IV: Improper Integration and Multiple Integrals:

Gamma and Beta Functions-Relation between them, their properties evaluation of improper integrals using Gamma/ Beta functions. Multiple integrals double and triple integrals change of order of integration- change of variables

UNIT-V: Laplace transform and its applications to Ordinary differential equations:

Laplace transform of standard functions Inverse transform first shifting Theorem, Transforms of derivatives and integrals Unit step function second shifting theorem Dirac's delta function Convolution theorem Periodic function Differentiation and integration of transforms Application of Laplace transforms to ordinary differential equations.

TEXT BOOKS:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Engineering Mathematics Vol - I, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
4. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

REFERENCE BOOKS:

1. Srimanta Pal, Subodh C. Bhunia, (2015) ,Engineering Mathematics, 1st Edition, New Delhi, Oxford University Press
2. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House
3. Ramana B.V (2010), Engineering Mathematics, New Delhi, Tata McGraw Hill Publishing Co. Limited
4. Mathematical Methods: S.R.K. Iyengar and R.K. Jain, Narosa Publishing House.

OBJECTIVES:

1. This course helps in translating a physical or other problem in mathematical model.
2. The course intends to provide an overview of Matrices which occur in physical and engineering problems.
3. To provide an overview of discovering the experimental aspect of modern applied mathematics.
4. This course creates the ability to model, solve and interpret any physical or engineering problem.
5. To gain knowledge about Laplace Transforms, Double integrals and Triple integrals to apply in engineering and technologies.

L	T	C
3	1	3

ENGINEERING PHYSICS – I
(COMMON TO ALL BRANCHES)

OBJECTIVES:

1. To know about crystals, their structures, properties and applications.
2. Able to understand light and LASER phenomena and their applications.
3. To know the fundamentals of Statistical Mechanics and understand about Dielectric and Magnetic materials.

OUTCOMES:

1. Students analyze and apply the studies for scientific applications of crystal in various fields.
2. Ability to interpret the applications of Dielectric and Magnetic materials in technology and daily life.
3. Able to experiment on nature of light and applications of LASER in various fields.

UNIT- I

Crystal Structures

Inter atomic force Cohesive energy of diatomic molecule (Qualitative), Space lattice, unit cell and Lattice parameters, Crystal systems Bravais lattices. Structures, Atomic radius, co-ordination number and packing fractions of Simple Cubic, Body Centered Cubic, Face Centered Cubic lattices, Structure of Diamond.

Crystal directions, planes and X- Ray diffraction

Crystal planes and directions Miller Indices, Inter planar spacing of orthogonal crystal systems, X-ray Diffraction: Bragg's law, Determination of lattice constant by XRD (Powder method), Crystal defects: Point and Line defects (Qualitative) Burger's Vector.

UNIT- II

Interference, Diffraction and Polarization

Superposition principle, Interference, Coherence, Interference in thin films, Newton's Rings –Experiment, determination of wavelength of monochromatic source. Diffraction - Fraunhofer and Fresnel diffraction, Diffraction due to single slit, Diffraction grating (Qualitative). Polarization- Double refraction, Nicol's Prism, applications of Polarization.

UNIT – III

Elements of statistical mechanics

Introduction, Phase space, Definition of Ensembles, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (Qualitative), Planck's law of black body radiation Deduction of Wien's law and Rayleigh-Jeans law from Planck's law.

Lasers

Characteristics of Lasers, Spontaneous and Stimulated Emission of radiation, meta stable state, Population inversion, lasing action, Einstein's coefficients and relation between them, Ruby Laser, Helium-Neon Laser, applications of Lasers.

UNIT – IV

Magnetism and Magnetic materials

Introduction Basic definitions, Origin of magnetic moment, Bohr magneton, Dia, Para, Ferro, Antiferro and Ferri magnetism, Domain theory of ferromagnetism, Hysteresis curve Soft and Hard magnetic materials and their applications.

UNIT- V

Dielectric Properties

Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Ionic and Electronic Polarizabilities, Internal Fields in Solids, Clausius Mossotti Equation. Piezo, Pyro and Ferro electricity, applications of ferroelectric materials.

TEXT BOOKS:

1. Engineering Physics by P K Palanisamy: Scietech publication.
2. Solid State Physics by M Armugam; Anuradha Publications.

REFERENCE BOOKS:

1. Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons.
2. Engineering Physics by R.K. Gaur and S.L. Gupta; Dhanpat Rai and Sons.
3. Engineering Physics by V Rajendran; McGraw hill education private ltd.
4. A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar: S Chand.
5. Engineering Physics by K Malik, A K Singh: Tata McGraw hill book publishers.
6. Engineering Physics by M.R. Srinivasan, New Age Publishers.

L	T/P/D	C
3	1/-/-	3

C PROGRAMMING –I
(CSE, IT)

OBJECTIVES:

- To understand the various steps in program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs.
- To learn to write Programs in C to solve programs using structured programming approach.
- To introduce the students the basic concepts as input output statements, loops, functions, arrays.

OUTCOMES:

- Students will demonstrate a depth of knowledge and apply the methods of C Language to solve the mathematical problems.
- Ability to apply and develop logical skills and problem solving using C Programming Language.

UNIT-I

Introduction to Computers: Computer System, Computing Environments, Generations of Computer Languages, Software Development Life Cycle, Algorithms and Flowchart.
Data Representation: Decimal, Binary, Octal, Hexadecimal number systems and Inter-Conversions, ASCII values.

UNIT-II

Introduction to C language: Background, Structure of C program, Creating and Running a C-Program, Input/ Output statements, C tokens, Data types, Operators, Operator Precedence and Associatively, Expression evaluation, Type Casting and Type Conversion, C Programming examples.

UNIT-III

Control Structures: Selection Statements: if and switch statements, Iterative Statements/Loops: while, for, do-while statements, goto, break and continue statements, C Programming examples.

UNIT-IV

Arrays: Introduction to one dimensional and two dimensional Arrays- Declaration, Initialization and Accessing array elements, Array applications, C programming examples.
Strings: Introduction, String Input/output functions, Declaration, Initialization and Accessing Strings, Array of Strings, String Manipulation functions- strlen(), strcat(), strcmp(), strcpy(), strrev(), C programming examples.

UNIT- V

Functions: Introduction to functions, Types of functions, Categories of functions, Recursion, Scope and Extent, Storage classes- auto, register, static, extern, Parameter passing techniques, Preprocessor Directives, C programming examples.

TEXT BOOKS

1. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F.Gilberg, Third Edition, Cengage Learnimng.

REFERENCE BOOKS

1. Let Us C, Yashavant P. Kanetkar, BPB Publications.
2. Computer System & Architecture, M. Marris Mano , 3 rd Edition , Pearson Education.
3. Programming in C Reema Thareja, 2 nd Edition Oxford University Press 2015.

L	T/P/D	C
3	1/-/-	3

ENGINEERING CHEMISTRY

Course objectives:
To appraise the students about the importance and role of chemistry in the field of Engineering by explaining the relevant topics. To enable students to apply the knowledge acquired in improving the properties of engineering materials. To provide the students with the necessary knowledge to solve the problems and make decisions with regards to the application of materials in a variety of engineering disciplines. To equip the students with the required fundamentals of engineering chemistry carry out in the interdisciplinary research such that the finding benefit the common man. After the completion of the course, the student would understand about the important chemistry of water, corrosion and its control, polymer chemistry, electro chemistry (including batteries) and advanced engineering materials.

UNIT-I: WATER: Hardness of water, expression of hardness ($CaCO_3$ equivalent), units and types of hardness. Estimation of temporary and permanent hardness of water by EDTA method. Numerical problems based on hardness of water. Potable water: characteristics, treatment of water for domestic supply. Desalination of brackish water: reverse osmosis. Alkalinity of water and its determination. Boiler troubles: priming and foaming, boiler corrosion, scales, sludges and caustic embrittlement. Boiler feed water and its treatment: Internal treatment (colloidal, phosphate calgon conditioning of water). External treatment (zeolite process and ion exchange process), Numerical problems on softening of water.

UNIT II: ELECTROCHEMISTRY: Conductance and its types. Electrode, electrode potential, galvanic cell, cell reactions and cell notation, cell EMF, types of electrodes (Normal Hydrogen Electrode, calomel electrode, glass electrode and quinhydrone electrode), Nernst equation Numerical problems. Potentiometric titrations. Concentration cells, classification with examples.
BATTERIES: Introduction to cell and battery, characteristics of a cell. Primary (dry cell and lithium cell) and secondary cells, (lead-Acid cell, Ni-Cd cell and Lithium ion cells,). Solar battery, engineering applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell, advantages and engineering applications of fuel cells.

UNIT III: CORROSION AND ITS CONTROL Introduction, types of corrosion : chemical and electrochemical corrosion, mechanism of chemical and electrochemical corrosion , galvanic, water line and pitting corrosion, factors affecting the rate of corrosion : nature of the metal, galvanic series, purity of metal, nature of corrosion product , nature of environment : effect of temperature, effect of pH, humidity. Corrosion control methods: Cathodic protection: sacrificial anode method and impressed current cathode method. Protective coatings: metallic coatings (anodic and cathodic), methods of application on metals, hot dipping (galvanizing), cladding, cementation, electroplating (of copper) electroless plating (of nickel) Organic coatings paints, its constituents and their functions.

UNIT IV: POLYMER CHEMISTRY: Introduction, classification of polymers, types of polymerization (addition and condensation, *mechanisms not included*). Plastics types of plastics thermoplastics and thermosetting plastics. Compounding and moulding of plastics. Preparation, properties and engineering applications of PVC, Teflon and Bakelite. Fibers: Nylon 6, 6 and Terelene (Dacron). Elastomers: natural rubber, structure, vulcanization. Synthetic rubbers: Buna-S, butyl rubber, Thikol rubber. Conducting polymers: classification, mechanism of conduction, Poly acetylene - preparation and effects of doping on conduction. Applications of conducting polymers.

UNIT V: ADVANCED ENGINEERING MATERIALS: Biodegradable polymers, types, examples: Polyhydroxy butyrate (PHB) ,Poly-Hydroxybutyrate-co-b-Hydroxy valerate (PHBV), Polyglycolic acid (PGA), Polylactic acid (PLA), Poly (Î-caprolactone) (PCL). Applications of biodegradable polymers. Composite materials: Constituents of composite materials. Types of composite materials. Advantages and engineering applications of composite materials. Nano materials: Introduction, basic methods of preparation and applications of nano meterials. Insulators- Classification, characteristics of thermal & electrical insulators and applications. Biofuels biodiesel, general methods of preparation and advantages

Text Books:

1. Engineering Chemistry by NYS.Murthy, Pearson, India.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpat Rai Publishing Company.

Reference Books:

1. Text Book of Engineering Chemistry by Shasi Chawla, Dhantpat Rai publishing Company.
2. Engineering Chemistry by C.Daniel Yesudian , Anuradha publications

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ENGINEERING GRAPHICS
(CSE & IT)

1. Objectives: To know about different types of Drawing Instruments and about different types of lines.
2. To know about different types of curves and projections.
3. To know projections of points, straight lines, solids etc.
4. To analyze the conversion of isometric projection to orthographic projection and vice versa.

Outcomes:

1. Student gets knowledge on various drawing instruments and its usage.
2. Students capable to draw various curves like conic curves, cycloid curves and involutes.
3. Student can understand about orthographic projection and able to draw points, lines, planes and solids according to orthographic projections.
4. Student can convert and draw the given orthographic view to isometric view and vice versa.

UNIT - I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, use of pencils, Lettering, Rules of dimensioning. Construction of polygons: Inscription and superscription of polygons given the diameter of circle. Curves used in Engineering Practice and their Constructions: Conic Sections: Ellipse, Parabola, Hyperbola including the Rectangular Hyperbola General method only. Cycloidal curves Cycloid, Epicycloid and Hypocycloid Involutes

UNIT - II

Drawing of Projections or Views (Orthographic Projection in First Angle Projection Only): Principles of Orthographic Projections Conventions First and Third Angle Projections, Projection of Points, Projection of Lines inclined to both planes, True lengths. (Mid points & Traces are eliminated).

UNIT - III

Projections of Planes: Projections of regular Planes Inclined to both planes. Projections of Solids: Projections of Regular Solids Regular Polyhedra, solids of revolution, Axis inclined to both planes Change of position.

UNIT –IV

Isometric Projections/views: Principles of Isometric Projection Isometric Scale Isometric Views Conventions Isometric Views of Lines, Plane Figures, Simple and Compound Solids Isometric Projection of objects having non- isometric lines.

UNIT –V

Conversion of Orthographic Views to Isometric Views of simple objects. Transformation of Projections: Conversion of isometric views to orthographic views of simple objects.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhatt / Charotar publishers
2. Engineering Drawing, K.L.Narayana and Kannaiah / Scietech publishers.

REFERENCES:

1. Engineering Drawing, N.S. Parthasarathy/Vela Murali, Oxford University Press.
2. Engineering Drawing, Basant Agarwal, TMH

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English Language Communication Skills Lab-I

Objectives

1. To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
3. To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
4. To improve the fluency in spoken English and neutralize mother tongue influence
5. To train students to use language appropriately for interviews, group discussion and public speaking.

Learning Outcomes:

1. Better Understanding of nuances of language through audio-visual experience and group activities.
2. Neutralization of accent for intelligibility.
3. Speaking with clarity and confidence thereby enhancing employability skills of the students.

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab:

Exercise-I

CALL Lab: Introduction to Phonetics
Speech Sounds
Vowels and Consonants

Exercise-II

ICS Lab: Ice-Breaking activity and JAM session
Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise-III

CALL Lab: Structure of Syllables
Past Tense Marker and Plural Marker
Weak Forms and Strong Forms
Consonant Clusters.

Exercise-IV

ICS Lab: Situational Dialogues -Role-Play- Self-introduction and introducing others- Greetings- Apologies- Requests.

Exercise-V

ICS Lab: Social and Professional Etiquette and Telephone Etiquette-Tenses-Non-Verbal Communications.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
2. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
3. **English Pronouncing Dictionary** Daniel Jones Current Edition with CD.
4. **A textbook of English Phonetics for Indian Students** by T. Balasubramanian (Macmillan)
5. **Lab Manual:** A Manual entitled "**English Language Communication Skills (ELCS) Lab Manual- cum- Work Book**", published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

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C PROGRAMMING LAB – I
(CSE, IT)

OBJECTIVES:

- To provide and understanding the concept of programming Languages.
- To write programs in C to solve the mathematical problems.
- To understand how to use the input output statements, loops, functions, arrays
- To learn debugging concepts.

OUTCOMES:

- Understand and analyze different syntax of C.
- Design a program for a given Problem.
- To analyze and design C Program for a particular problem.

Week 1:
Familiarity with Basic Linux Commands

Week 2:
Using vi editor – Creation of text files

Week 3:
Write simple programs using scanf() and printf() functions and familiarity with format strings.

Week 4:
Write programs to illustrate Operators

Week 5:
Write programs to illustrate If statements

a) To find largest and smallest of given numbers
b) To find the roots of the quadratic equation.

Week 6:

a) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)
b) Write a C program to calculate the following Sum:
Sum=$1-x^2/2! + x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

Week 7:
Write programs on while and do..while loops

a) Program to find the sum of the individual digits of a given positive integer.
b) Program to generate the first n terms of the Fibonacci sequence
c) Program to check the given no is Palindrome or not

Week 8:

Write programs on for loop and nested loops.

- **a)** To generate sum of n natural numbers
- **b)** To generate Pascal triangle
- **c)** To generate all the prime numbers between 1 and n

Week 9 & 10:

- **a)** Program to find the minimum and maximum element of an array.
- **b)** Program to search for given element in an array.
- **c)** Program to convert Binary number to Decimal number and vice-versa.

Week 11:

- **a)** Program to perform Addition of Two Matrices
- **b)** Program to perform Multiplication of Two Matrices

Week 12:

- **a)** Implement string manipulation functions
- **b)** Write a C program to accept a string of any characters and display the number of vowels in that string
- **c)** Display number of words and characters in a string.

Week 13 & 14:

a) Implement categories of user defined functions

b) Implement recursive and non recursive functions

   i. To find the factorial of a given integer.
   ii. To find the GCD (greatest common divisor) of two given integers.

Week 15:

Implementation of parameter passing Techniques

a) Call by value
b) Call by reference

Week 16:

Review and Revision

TEXT BOOKS:

1. C Programming & Data Structures, E. Balagurusamy, 4th Edition, TMH.
2. A Structured Programming Approach using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

REFERENCE BOOKS:

1. Let Us C, Yashavant P. Kanetkar, BPB Publications.
2. Computer System & Architecture, M.Morris Mano, 3rd Edition 2006.
3. Programming in C, Reema Thareja, 2nd Edition Oxford University Press 2015.

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ENGINEERING PHYSICS AND CHEMISTRY LAB

Engineering Physics Lab:

Any Five Experiments from the following:

1. Torsional Pendulum Experiment Determination of rigidity modulus of material of wire
2. Melde's experiment
3. Newton's Rings
4. Dispersive Power of the material of a Prism using Spectrometer
5. Stewart & Gee's experiment
6. LED Characteristics
7. Diffraction Grating – Determination of wavelength of monochromatic light
8. RC Circuit – Decay of Charge

Engineering CHEMISTRY LAB

Any six <u>experiments</u> are to be performed

1. Fundamentals of volumetric analysis: (a) Determination of strength of an acid (HCl)
2. Estimation of ferrous iron by dichrometry
3. Estimation of hardness of water by EDTA method.
4. Determination of alkalinity of water.
5. Determination of free chlorine or chlorides in water.
6. Estimation of copper by colorimetric method.
7. Estimation of HCl by conductometry using standard NaOH solution.
8. Estimation of HCl by potentiometry using standard NaOH solution.
9. Determination of viscosity of sample oil by Redwood/Oswald's viscometer
10. Determination surface tension of lubricants.

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IT WORKSHOP
(CSE & IT)

Objectives: The IT Workshop for engineers is a training lab course spread over 40 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, and Power Point.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. **The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.**

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations. (Recommended to use Microsoft office 2007 in place of MS Office 2003).

OUTCOMES:

- Getting enough knowledge to assemble a computer and identifying various components.
- To get hands on experience in software installation.
- Ability to understand the troubleshooting problems.
- To learn the tools PowerPoint, documentation, tabulation and calculations.
- To get exposure how to use internet and World Wide Web.

PC Hardware

Exercise 1 – Task 1: Identify the peripherals of a computer, components in a System Cabinet and its functions. Draw the block diagram of the compute mother board along with the configuration of each peripheral and submit to your instructor.

Exercise 2 – Task 2: Every student should disassemble and **assemble the PC back to working condition.** Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Exercise 3 – Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Exercise 4 – Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.

Internet & World Wide Web

Exercise 5 - Task 1: Orientation & Connectivity Boot Camp : Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 6 - Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word

Exercise 7&8: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel

Exercise 9&10: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point

Exercise 11&12: Students will be working on MS power point which helps them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

REFERENCES:

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dream tech.
2. 2. The Complete Computer upgrade and repair book, 3rd edition Cheryl A Schmidt, WILEY Dreamtech.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+Handbook Kate J. Chase PHI (Microsoft)
5. 5. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. CISCO Press, Pearson Education.
6. 6. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by Patrick Regan CISCO Press, Pearson Education.

Part – C

Syllabi of

B.Tech., I Year II Semester

(CSE and IT)

English– II

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(COMMON TO ALL BRANCHES)
Semester II

Unit –I: Last Leaf by O Henry
G –Tense & Aspect
V – Synonyms and Antonyms

Unit-II G: Risk Management from Skills Annex -
Functional English for Success L -Listening for specific details and information
S- Narrating, expressing opinions and telephone interactions R -Reading for specific details and information

W- Writing formal letters and CVs
Unit-III: The Secret of Work by Swami Vivekananda from "Epitome of Wisdom"
G- Prepositions and Concord, Voice and Reported Speech
V-Collocations and Technical Vocabulary

Unit-IV: Sports and Health from "Skills Annex -Functional English for Success
Critical Listening and Listening for speaker's tone/ attitude
S- Group discussion and Making presentations
R- Critical reading, reading for reference
W-Project proposals; Technical Reports, Project Reports and Research Papers

Unit-V: Convocation Speech by Narayan Murthy, from "Epitome of Wisdom"
G- Writing Memos, Minutes of Meeting, Transcription (Translating from the mother tongue to English), V-Vocabulary - idioms and Phrasal verbs, One-Word Substitutes

REFERENCES:

1. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
2. Technical Communication, Meenakshi Raman, Oxford University Press
3. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
4. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw –Hill.

MATHEMATICS-II
(COMMON TO CE, EEE, ME, ECE, CSE & IT)

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OBJECTIVES:

1 This course creates the ability to model, solve and interpret any physical or engineering problem.
2 To gain knowledge about vector calculus, Fourier series and Fourier transforms to apply in engineering and technologies.
3 The course intends to provide an overview of Matrices which occur in physical and engineering problems.
4 This course enhances the conceptual understanding of the learners about the solutions of engineering problems.
5 Acquire knowledge about different methods of solution to solve a physical problem.

OUTCOMES:

At the end of the course, the student will be able to:

1. Gains the knowledge to tackle the engineering problems using the concepts of Fourier series, various transforms and partial differential equations.
2. Become familiar with the application of ordinary differential equations and vector calculus to engineering problems.
3. Verify the integral theorems.

UNIT-I: Differential Equations of first order and their Applications:

Differential equations of first order and first degree: exact, linear and Bernoulli, Applications to Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT-II: Higher Order Linear Differential Equations and their Applications:

Linear differential equations of second and higher order with constant coefficients, RHS term of the type f(X) $= e^{ax}, \sin ax, \cos ax \text{ and } x^k, e^{ax}V(x), x^kV(x)$.Method of variation of parameters. Equations reducible to constant coefficients-Cauchy's and Lagrange's differential equations. Applications - Bending of beams, Electrical circuits, simple harmonic motion.

UNIT-III: Fourier series:

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT-IV: Fourier Transforms:

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms Fourier sine and cosine transforms properties inverse transforms Finite Fourier transforms.

UNIT-V: Vector Calculus:

Gradient- Divergence- Curl and their related properties - Potential function - Laplacian and second order operators. Line integral work done. Surface integrals - Flux of a vector valued function and Volume integral. Vector integrals theorems: Green's – Stoke's and Gauss's Divergence Theorems (Only Statements & their Verifications).

TEXT BOOKS:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Engineering Mathematics Vol - I, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
4. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.

REFERENCE BOOKS:

1. Srimanta Pal, Subodh C. Bhunia, (2015), Engineering Mathematics, 1st Edition, New Delhi, Oxford University Press.
2. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.
3. Integral Transforms by A.R.Vasista,Krishana Prakashan Private Limited
4. Schaum's outline series on Vector Analysis; Linear Algebra.
5. Larry C. Andrews and Bhimsen K. Shivamoggi, Integral Transforms for Engineers, Prentice – Hall of India Private Limited, New Delhi.

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ENGINEERING PHYSICS – II
(COMMON TO ALL BRANCHES)

OBJECTIVES:

1. To know fundamentals of Quantum Mechanics, Free Electron Theory of Metals and Band Theory of solids.
2. To know basics of semiconductors and semiconductor devices.
3. To understand superconductivity, applications of optical fibers and fundamentals of Nanoscience.

OUTCOMES:

1. To get an idea to apply Classical and Quantum mechanics in various engineering fields.
2. Able to construct circuits with semiconductor devices and consolidate applications of Nano-science in the field of Engineering and Technology.
3. To interpret the importance of superconductivity and applications of Optical fiber.

UNIT – I

Free electron theory of metals

Classical Theory Explanation of Electrical Conductivity and Ohm's Law Drawbacks, Sommerfeld theory (Qualitative).

Principles of Quantum Mechanics

Waves and Particles, de-Broglie hypothesis - Matter waves, Davisson and Germer experiment, Schrodinger Time Independent Wave Equation – Wave function and its Physical Significance, Particle in one dimensional potential box (wave functions, probability densities and energy states), Density of States.

UNIT II

Band theory of solids

Electron in a periodic potential Bloch Theorem, Kronig-Penney model (Qualitative), Origin of energy band formation in solids, Classification of materials into Conductors, Semiconductors & Insulators. Concept of effective mass of an electron.

Fiber optics

Basic principle of optical fiber, Acceptance angle, Acceptance cone, Numerical aperture (Quantitative), Types of optical fiber, Applications of Optical Fiber.

UNIT III

Semiconductor Physics

Intrinsic and Extrinsic Semiconductors, Fermi level in Intrinsic and Extrinsic semiconductors, Carrier Concentration in Intrinsic and Extrinsic Semiconductors. Hall effect, P-N junction diode, Tunnel diode, LED and Photodiode.

UNIT - IV

Superconductivity

Introduction, Heat capacity, isotopic effect, Persistent currents, Critical fields, Meissner effect, Type I and Type II superconductors, BCS Theory, Josephson effect SQUIDS, Basics of High Temperature Superconductors, Applications of Superconductors.

UNIT V

Fundamental of Nanoscience:

Introduction Basic definitions: Nanoscale, Nanoscience and Nanotechnology, Types of Nanomaterials, Surface to Volume Ratio, Quantum confinement, Synthesis of Nanomaterials Top down & Bottom up approaches: sol-gel, Ball milling and CVD methods, Applications.

TEXT BOOKS:

(1) Engineering Physics by P K Palanisamy: Scietech publication
(2) Solid State Physics by M Armugam; Anuradha Publications

REFERENCE BOOKS:

(1) Introduction to Solid State Physics by Charles Kittel : John Wiley & Sons
(2) Engineering Physics by R.K.Gaur and S.L.Gupta; Dhanpat Rai and Sons
(3) Engineering Physics by V Rajendran; McGraw hill education private ltd.
(4) A Text book of Engineering Physics by M N Avadhanulu, P G Kshirsagar; S Chand
(5) Engineering Physics by K Malik, A K Singh; Tata Mc Graw hill book publishers
(6) Engineering Physics by M.R.Srinivasan, New Age Publishers

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C PROGRAMMING – II
(CSE, IT)

OBJECTIVES:

- To understand the basic concepts such as Abstract data types Linear and Non Linear Data Structures.
- To understand the notations used to analyze the performance of algorithms.
- To understand the behavior of Data Structures such as Unions, Pointers, Files, Stacks and Queues and their representation.
- To choose the appropriate data structure for a specified application.
- To understand and analyze various searching and sorting algorithms.
- To write programs in C to solve problems using Data Structures such as pointers, Strings, Arrays, Searching and sorting and Linear Lists and Linked Lists.

OUTCOMES:

- Learn how to use Pointers, Files and Enumerated data concepts for realistic problems.
- Ability to understand the concept of data structures and its usage.
- Ability to demonstrate the practical applications of Stacks and Queues.
- Ability to solve problems independently and think critically.

UNIT – I

Searching and Sorting – Basic concepts, Searching-Linear and Binary search, Sorting-Selection sort, Bubble sort, & Insertion sort.

UNIT – II

Pointers: Introduction, Declaration and Initialization, Pointer Operators, Pointer to Pointer, Pointer Expressions, Pointers and Arrays- Pointer to Array, Array of Pointers, C programming examples.
Dynamic Memory Allocation Functions- malloc ( ), calloc ( ), realloc( ) , free()

UNIT – III

Derived types – The Type Definition (typedef), Enumerated types, Structures - Declaration, Initialization, Accessing structures, Operations on Structures, Nested Structures, Structures through Pointers, Structures and Functions, Self Referential Structures, Unions ,Bit fields ,C programming examples.

UNIT – IV

File Management – Basic concepts, working with text files and binary files, State of a file, Opening and Closing files, File Input / Output functions (standard library input / output functions for files), File status functions (error handling) , Positioning functions, Command –Line Arguments ,C programming examples.

UNIT - V

Linear Data Structures- Stack- Push and Pop operations, Queue- Insertion and Deletion operations, Singly linked list- Insertion, deletion operations.

TEXT BOOKS:

1. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F.Gilberg, Third Edition, Cengage Learnimng.

REFERENCE BOOKS:

1. Understanding pointer in C, Yashavant P.Kanetkar, 3rd Edition,BPB Publications 2006.
2. Programming in C, Reema Thareja, 2 nd Edition, Oxford University 2015.
3. Theory and Problems of Data Structures, Seymour Lipschutz, Mc Graw Hill, 1986.

MATHEMATICS-III
(COMMON TO EEE, ECE, CSE & IT)

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3	1	0	3

OBJECTIVES

1. The objective is to find the relation between the variables x and y out of the given data (x,y).
2. The aim to find such relationships which exactly pass through data or approximately satisfy the data under the condition of least sum of squares of errors.
3. The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data.
4. This topic deals with methods to find roots of an equation and solving a differential equation.
5. The numerical methods are important because finding an analytical procedure to solve an equation may not be always available.
6. In the diverse fields like electrical circuits, electronic communication, mechanical vibration and structural engineering, periodic functions naturally occur and hence their properties are very much required.
7. The aim at forming a partial differential equation (PDE) for a function with many variables and their solution methods. Two important methods for first order PDE's are learnt. While separation of variables technique is learnt for typical second order PDE's such as Wave, Heat and Laplace equations

OUTCOMES:

At the end of the course, the student will be able to:

1. Apply the numerical methods to find a root of algebraic and transcendental equations.
2. Apply the numerical methods to find the solutions of ordinary differential equations.
3. Find the solutions of one dimensional wave equation, two dimensional wave equation and one dimensional heat conduction equation.

UNIT-I: Solution of Non- Linear Equations and Linear System of Equations:

Solution of Algebraic and Transcendental Equations the Bisection Method the Method of False Position The Iteration Method Newton-Raphson Method. Solving system of non-homogeneous equations by L-U Decomposition method (Crout's Method) Jacobi's and Gauss-Seidel Iteration method,

UNIT-II: Interpolation:

Introduction- Errors in Polynomial Interpolation Finite differences- Forward Differences-Backward differences Central differences Symbolic relations and separation of symbols- Newton's formulae for interpolation Central difference interpolation Formulae Gauss Central Difference Formulae Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

UNIT-III: Numerical Integration & Curve Fitting:
Generalized Quadrature (Newton's Cote's formula), Trapezoidal, Simson's and Weddle's rules andproblems. Curve fitting: Fitting a straight line – Second degree curve exponentional curve-power curve by method of least squares.

UNIT – IV: Numerical Solution of IVP's in ODE:
Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods.

UNIT-V: Partial Differential Equations:
Introduction and Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations, Charpits Method, Method of separation of Variables for second order equations. Classification of general second order partial differential equations. Applications of Partial Differential Equations- One dimensional wave equation, Heat equation.

TEXT BOOKS:

1. Grewal B.S (2007), Higher Engineering Mathematics, 40th Edition, New Delhi, Khanna Publishers.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), Mathematical Methods, 10th Revised Edition, New Delhi, S. Chand & Company Limited.
3. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley Publications.

REFERENCE BOOKS:

1. Srimanta Pal, Subodh C. Bhunia, (2015), Engineering Mathematics, 1st Edition, New Delhi, Oxford University Press.
2. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.
3. Introductory Methods of Numerical Analysis. S.S. Sastry, Prentice Hall.
4. Numerical Analysis (Paper-IV), First Edition 2010, Telugu Akademi, Hyderabad.
5. Schaum's outline series on Matrices.
6. Mathematical Methods of Science and Engineering (Aided with Matlab) Kanti B.Datta (2012), Seventh Edition, CENGAGE Learning.

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BASIC ELECTRICAL ENGINEERING
(CSE & IT)

Objectives:
This course introduces the preliminaries of the basic electrical engineering parameters and the concepts of AC/DC circuits. The construction and operation of the transformers, DC and AC machines is introduced. It also gives knowledge of the measuring instruments and their operational aspects in detail.

UNIT – I
Introduction to Electrical Engineering: Ohm's law, basic circuit components, Kirchhoff's laws. Simple problems. Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, and series parallel circuits, star delta and delta star transformation. Network theorems-Superposition, Thevenins's, Norton's,Reciprocity, Maximum power transfer theorems and simple problems.

UNIT-II
Alternating Quantities: Principle of ac voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits.

UNIT-III
Transformers: Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

UNIT-IV
D.C. Machines:

D.C generators: Principle of operation of dc machines, types of D.C generators, EMF equation in D.C generator. **D.C motors**: Principle of operation of dc motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C motor.
A.C. Machines: Principle of operation of three phase Induction motor and Alternator.

UNIT- V

Basic Instruments: Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters and Voltmeters (elementary Treatment only).

TEXT BOOKS:

1. Basic concepts of Electrical Engineering, PS Subramanyam, BS Publications. 2014 Edition.
2. Principles of Electrical Engineering, V.KMehta, Rohit Mehta, S.Chand Publications. 2012, Revised Edition.

REFERENCE BOOKS:

1. Basic Electrical Engineering, Abhijit Chakrabarthi, Sudipta nath, Chandrakumar Chanda, Tata-McGraw-Hill.2008,1st Edition
2. Basic Electrical Engineering, S.N. Singh, PHI. 2011, Eastern Economy Edition.
3. Basic Electrical Engineering, T.K.Nagasarkar and M.S. Sukhija, Oxford University Press. 2011, 2nd Edition
4. Fundamentals of Electrical Engineering, RajendraPrasad, PHI. 2014, 2nd Edition.
5. Basic Electrical Engineering by D.P.Kothari , I.J. Nagrath, McGraw-Hill.2007,2nd Edition

Outcomes:

After going through this course the student gets knowledge of the basic electrical circuit parameters. The student will understand the operation of the transformers and electromechanical energy conversion. The construction, operation and characteristics of DC/AC machines will be known. The constructional features and the operation of measuring instruments like voltmeter, ammeter, wattmeter etc will be understood. The student will be able to apply the above conceptual things to real-world electrical and electronics problems.

L	T/P/D	C
0	-/ 3	2

English Language Communication Skills Lab-II

Objectives

1. To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
3. To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
4. To improve the fluency in spoken English and neutralize mother tongue influence.
5. To train students to use language appropriately for interviews, group discussion and public speaking

Learning Outcomes:

1. Better Understanding of nuances of language through audio- visual experience and group activities
2. Neutralization of accent for intelligibility
3. Speaking with clarity and confidence thereby enhancing employability skills of the students

Syllabus: English Language Communication Skills Lab shall have two parts:

1. **Computer Assisted Language Learning (CALL) Lab**
2. **Interactive Communication Skills (ICS) Lab**

The following course content is prescribed for the English Language Communication Skills Lab

Exercise-I

CALL Lab: Minimal Pairs
Word accent and Stress Shifts
Listening Comprehension

Exercise-II

ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines
Question Tags and One-Word Substitutes
Concord (Subject in agreement with verb) and Words often misspelt- confused/misused

Exercise-III

CALL Lab: Intonation and Common Errors in Pronunciation.-Neutralization of Mother Tongue Influence and Conversation Practice.

Exercise-IV

ICS Lab: Extempore- Public Speaking
Active and Passive Voice,
Common Errors in English,
Idioms and Phrases

Exercise-V

ICS Lab: Information Transfer
Oral Presentation Skills
Reading Comprehension
Job Application with Resume preparation.

Books Suggested

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation.
2. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication.

L	T/P/D	C
0	-/3	2

C PROGRAMMING II LAB
(CSE, IT)

OBJECTIVES:

- To write and execute programs in C to solve problems using data structures such as Unions, Pointers, Files, Stack and Queue.
- To write and execute programs in C to implement various sorting and searching methods.

OUTCOMES:

- Ability to identify the appropriate data structure for given problem.
- Able to design and analyze the time and space complexity of algorithm and program.
- Ability to effectively use compilers includes library functions, debuggers and trouble shooting.

Week 1:

a) Implementation of Linear Search
b) Implementation of Binary Search.

Week 2:

a) Implementation of Linear Search & Binary Search using Recursion.
b) Implementation of Bubble Sort.

Week 3:

a) Implementation of Selection Sort
b) Implementation of Insertion Sort

Week 4:

Write programs to illustrate pointers

a) To implement pointer arithmetic
b) To implement pointer to pointer
c) To implement array of pointers

Week 5:

Write C program to illustrate String Handling functions using pointers- to copy, concatenate, compare, reverse and length.

Week 6:

Basic programs in structures- student details, employee details, Inventory management using array of structures.

Week 7:

a) Write C program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(Note: represent complex number using a structure.)

b) Write a C program to illustrate Nested structures

Week 8:

Review and Revision.

Week 9:

a) Write C programs to illustrate Unions

b) Write C programs to illustrate Enumerated data type

Week 10:

a) Write C program to display the contents of a file.

b) Write C program to count the no. of characters ,words and lines of a text file

c) Write C program to implement Command line arguments

Week 11:

a) Write C program to merge two files into a third file (i.e., the contents of the first file Followed by those of the second are put in the third file)

b) Write C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

Week 12:

a) Write C program to illustrate Stack operations using arrays

b) Write C program to illustrate Queue operations using arrays

Week 13:

Write C program to implement the operations of Single Linked List

Week 14:

a) Write C program to illustrate Stack operations using Linked List.

b) Write C program to illustrate Queue operations using Linked List

Week 15:

Review and Revision.

TEXT BOOKS:

1. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F.Gilberg, Third Edition, Cengage Learnimng.

REFERENCE BOOKS:

1. Understanding Pointers in C, Yashavant P.Kanetkar, 3rd Edition, BPB Publications. 2006.
2. Programming in C, Reema Tahreja, 2nd Edition,Oxford University Press 2015.
3. Theory and Problems of Data Structures, Seymour Lipschutz, Mc Graw Hill, 1986.

ENGINEERING WORKSHOP

(Common to CSE, IT)

L	T	P/D	C
0	0	3	2

Objective: To impart basic knowledge of various tools and their use in different sections of manufacture such as carpentry, Tin-smithy and house wiring.

1. **TRADES FOR EXERCISES:**

   At least two exercises from each trade:

   - Carpentry.
   - Tin-smithy and development of jobs carried out and soldering.
   - House-wiring.

2. **TRADES FOR DEMONSTRATION & EXPOSURE:**

   - Plumbing
   - Power tools in construction, wood working, electrical engineering and mechanical engineering.

TEXT BOOKS:

1. Work shop manual P.Kannaiah / K.L Narayana/scitech publishers.
2. Workshop manual by Venkat Reddy.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

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ACADEMIC REGULATIONS (R15)

for

B.Tech (CSE&IT) Second Year

(Applicable for the batches admitted from the Academic Year 2017-2018 onwards)

Part – B

Course Structure & Syllabi
of

B.Tech., II Year I Semester

COURSE STRUCTURE

II YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A13014	Probability & Statistics	3	1	0	3	4	100
A13504	Mathematical Foundations of Computer Science	3	1	0	3	4	100
A13505	Data Structures	4	1	0	4	5	100
A13406	Digital Logic Design	3	1	0	3	4	100
A13506	Object Oriented Programming	4	1	0	4	5	100
A13401	Electronic Devices & Circuits	3	1	0	3	4	100
A13585	Data Structures Lab	0	0	3	2	3	75
A13483	Electronic Devices & Circuits and Digital Logic Design Lab	0	0	3	2	3	75
MC-I	Mandatory Course-I	2	0	0	-	2	75
	Total	**22**	**6**	**6**	**24**	34	825

II YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A14507	Design and Analysis of Algorithms	4	1	0	4	5	100
A14508	Computer Organization	3	1	0	3	4	100
A14509	Database Management Systems	4	1	0	4	5	100
A14510	Software Engineering	3	1	0	3	4	100
A14511	Java Programming	4	1	0	4	5	100
A14016	Environmental Science	2	1	0	2	3	100
A14586	Java Programming Lab	0	0	3	2	3	75
A14587	Database Management Systems lab	0	0	3	2	3	75
MC-II	Mandatory Course-II	2	0	0	-	2	75
	Total	**20**	**6**	**6**	**24**	34	825

Note: All End Examinations (Theory and Practical) are of three hours duration.

L – Lecture **T – Tutorial** **P – Practical** **D – Drawing**

II Year B.Tech. CSE/IT – I Sem
PROBABILITY AND STATISTICS
(COMMON TO CSE, IT, ME& CE)

L	T	P/D	C
3	1	0	3

Course Objectives:

- To revise elementary concepts and techniques of probability & statistics
- To extend and formalize knowledge of the theory of probability and random variables
- To introduce new techniques for carrying out probability calculations and identifying probability distributions
- To motivate the use of statistical inference in practical data analysis
- To study elementary concepts and techniques in statistical methodology
- To provide a introduction to subsequent statistics courses

Course Outcomes:

- Demonstrate an understanding of the basic concepts of probability and random variables.
- construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance
- Understand the concept of the sampling distribution of a statistic, and in particular describe the behavior of the sample mean.
- compute probabilities based on practical situations using the binomial and normal distributions
- use the normal distribution to test statistical hypotheses and to compute confidence intervals
- Application of Regression Analysis to analyze a problem

UNIT – I
Random Variables: Random variables – Discrete and continuous- Expectation- Properties, Moment Generating Function and Fitting of Binomial, Poisson & Normal distributions

UNIT – II
Testing of Hypothesis I: Sampling Distribution-Definition of Sample, Population and Types of Sampling. Estimation- Point estimation, Interval estimation, Testing of Hypothesis- Null hypothesis – Alternative hypothesis, Type I & Type II errors – critical region confidence interval for mean, testing of hypothesis for single mean and difference between the means for large samples.
UNIT – III

Testing of Hypothesis II: Confidence interval for the proportions, Tests of hypothesis for the proportions- single and difference between the proportions for large samples.

Small Samples - t-distribution, F-Distribution, χ^2 distribution

UNIT –IV

Correlation and Regression: Coefficient of correlation – The Rank correlation, Regression Coefficients – Properties of regression coefficients, the two lines of regression, Multi Linear Regression.

UNIT –V

Quality Control: Control Charts-Control lines, determination of control limits, Types of Control Charts-Control Charts for variables (mean chart, Range chart)-charts for attributes (fraction defective, no. of defectives and defects for unit).
Time Series: Components of Time Series-Measurement of Trend

TEXT BOOKS:

1. Probability & Statistics by Dr. T.K.V.Iyengar, Dr.B.Krishna Gandhi et.al S.Chand Publications.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.
3. Probability & Statistics for Engineers by Miller and John E Freund, Prentice Hall of India.
4. R.C.Gupta: Statistical Quality Control.
5. Fundamentals of Applied Statistics by S C Gupta ,Sultan Chand and Sons

REFERENCES:

1. Fundamentals of Mathematical Statistics by S.C. Gupta & V.K. Kapoor, S-Chand & Sons.
2. Srimanta Pal, Subodh C. Bhunia, (2015) ,Engineering Mathematics, 1st Edition, New Delhi, Oxford University Press
3. Probability, Statistics and Queueing Theory,2nd Edition,Trivedi, John Wiley and sons
4. Probability and Statistics by E.Rukmangadachari , Pearson Education; First edition (2012)
5. Probability and Statistics for Engineering and the Sciences, 8th Edition, Jay L Devore, Cengage Learning.
6. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
7. Statistical Quality Control, M.Mahajan, Dhanpat Rai & Sons.

II Year B.Tech. CSE/IT – I Sem.

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

L	T	P	C
3	1	0	3

Course Objectives:

1. Define the syntax and semantics of propositional and predicate logic.
2. Translate statements from a natural language into its symbolic structures in logic.
3. Prove elementary properties of modular arithmetic and explain their applications in Computer Science, for example, in cryptography and hashing algorithms.
4. Apply the notion of relations on some finite structures, like strings and databases.
5. Analyze algorithms using the concept of functions and function complexity.
6. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

Course Outcomes:

1. To evaluate elementary mathematical arguments and identify fallacious *reasoning* (not just fallacious conclusions).
2. Solve discrete mathematics problems that involve: computing permutations and combinations of a set.
3. Analyze and deduce problems involving recurrence relations and generating functions.
4. Perform operations on discrete structures such as sets, functions, relations, and sequences.
5. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

UNIT -- I:

Foundations: Basics, Sets, Fundamentals of Logic, Logical Inferences, First order logic and other methods of Proof, Rules of Inference for Quantified Propositions.

UNIT – II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with & without repetitions, constrained repetitions.

UNIT -- III:

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations.

UNIT -- IV:

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, Paths and Closures, Directed Graphs and adjacency matrices, Topological Sorting.

UNIT -- V:

Graphs - Basic Concepts, Isomorphism and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. "Discrete Mathematics for Computer Scientists and Mathematicians" by Joe L. Mott, Abraham Kandel, TheodareP.Baker, Second Edition, PHI, 2009.
2. Discrete Mathematics R.K.Bisht, H.S.Dhami, OXFORD Higher Education.

Reference Books:

1. "Discrete Mathematics and its Applications", Kenneth H Rosen,Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition, 2007.
2. "Discrete Mathematical Structures with Applications to Computer Science", Tremblay J P and Manohar R, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007.

II Year B.Tech. CSE/IT – I Sem.
DATA STRUCTURES

T	P	C
4	1	4

Course Objectives:

1. Understand various static and dynamic representations of data structures.
2. Understand fundamental algorithmic problems of various nonlinear data structures.
3. To be familiar with Graph representations and traversals.
4. Know the basic concepts of Hashing.

Course Outcomes:

1. Analyze the representation of various static, dynamic and hierarchical data structures.
2. Design and implement the mechanism of stacks, general tree data structures with their applications.
3. Implement various algorithms on graph data structures, including finding the minimum spanning tree , shortest path with real time applications etc.,
4. Implementation of various advance concepts of binary trees and graphs with real time applications.
5. Outline the concepts of hashing, collision and its resolution methods using hash function.

UNIT -- I:

Introduction: What is data structure, Types of data structures, Static and Dynamic representation of data structure and comparison. **Strings:** String definition, String built-in functions (strlen(),strcpy(),strcat(),strcmp(),strrev()), Strings and Pointers (Ch-3,T3), **Stacks:** Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack, Queues: Operations and types of Queues.

UNIT -- II:

Trees: Basic terminology, Types of trees: Binary Tree: terminology, Complete and Full Binary Tree, Extended Binary Trees, Threaded Binary Trees and In order Threading, Representation of Trees using Arrays and Linked lists (advantages and disadvantages). Tree Traversal and Representation of Algebraic expressions; Algorithms for Tree Traversals.

UNIT -- III:

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Algorithm for Inserting, deleting and searching in BST. Representation and advantages of AVL Trees, algorithms on AVL Trees-Insertion, Rotation and Deletion. M-way trees with examples, Definition and advantages of B-trees, B+ Trees, Red-Black Trees.

UNIT -- IV:

Graphs-Basic terminology, Representation of graphs: sequential representation (Adjacency, Path Matrix) Linked representation. Graph Traversals-Breadth First Search, Depth First Search with algorithms. Definition and properties of Spanning Tree, Minimum Spanning Tree, Dijkstra Algorithms.

UNIT -- V:

Hashing: General Idea, Hash Functions, Separate Chaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Collisions in Hashing, Implementation of Dictionaries

Text Books:

1. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition.
2. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg&Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition, 2005.
3. Data Structures Using C, Second Edition Reema Thereja OXFORD higher Education.

Reference Books:

1. "Data Structures Using C and C++", Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhi India.
2. "Fundamentals of Data Structures", Horowitz and Sahani, *Galgotia Publications* Pvt Ltd Delhi India.
3. Data Structure Using C, A.K. Sharma, Pearson Education India.

II Year B.Tech. CSE/IT – I Sem.

DIGITAL LOGIC DESIGN

L	T	P	C
3	1	0	3

Course Objectives:

1. Understand the concepts of Binary system and conversions.
2. Be familiar with the concepts of logical functions using Boolean algebra
3. Learn various combinational circuits.
4. Understand the functionality of flip flops and design of sequential circuits.
5. Know the concepts of basic memory system.

Course Outcomes:

1. Understand various number systems, conversions, range and error detecting and correcting codes and their significance.
2. Evaluate the minimization of logic gates using Boolean algebraic principles and k-maps.
3. Design various simple and complex combinational circuits with real time applications.
4. Analyze the basic principles behind Flip flops & the design of sequential circuits with real time applications.
5. Illustrate various types of memory devices and their design.

UNIT -- I:

Number Systems: Binary, Octal, Hexa Decimal, and Conversions, range; Binary additions and subtractions (using 1c and 2c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; **BCD numbers:** Representation of 8421, 2421, Ex-3, Gray and self complementary codes; additions and subtractions on 8421 codes; **Error detecting codes:** even, odd parity, hamming codes; **Error correcting codes:** hamming codes, block parity codes; Floating point representation.

UNIT --II:

Boolean Algebra and Digital Logic GATES, Basic Boolean laws and properties; Boolean functions; canonical and standard forms (SOP, POS); Gate minimization using three and four variable K-Map's with and without don't cares. Encoders, Decoders, Multiplexers, D-Multiplexers;

UNIT -- III:

Definition of combinational circuits, design procedure for half, full, decimal (8421) adders and subtractors; Combinational Circuit Design for BCD code converters.

UNIT -- IV:

Sequential circuits, latches, Flip Flops; Analysis of clocked sequential circuits, State Reduction and Assignment, Register, Ripple Counters, Synchronous Counters, Other Counters.

UNIT -- V:

Types of Memory – Main memory – Random Access Memory, ROM, Types of ROM; Decoder and RAM interface: Address lines, data lines, chip select signal; Design of large memories using small memories, using decoders; problems in memory design; Cache Memory- design issues, hit and miss ratio related problems; Associative and Auxiliary memory.

Text Books:

1. M. Morris Mano, Digital Design, Third Edition, Pearson Education/PHI, 2001.
2. Roth, Fundamentals of Logic Design, Fifth Edition, Thomson, 2004.

Reference Books:

1. John F. Wakerly, Digital Design: Principles and Practices, 4th Edition, Pearson / Prentice Hall, 2005.
2. Malvino & Leach, Digital Principles and Applications, 7th Edition, Tata McGraw-Hill Edu., 2010.
3. A.K. Maini, Digital Electronics, Principles and Integrated Circuits, 1st Ed, Wiley India Publ., 2007.
4. M. Morris Mano and Michael D. Ciletti, Digital Design, 5th Edition, Pearson Education, 2012.

II Year B.Tech. CSE/IT – I Sem.

OBJECT ORIENTED PROGRAMMING

L	T	P	C
4	1	0	4

Course Objectives:

1. Understand the C++ program structure and also the basics of C++ Programming language.
2. Use input and output formatted stream classes and the file streams and file modes to access the files.
3. Know the template classes and functions and Runtime error and how to handle that error.

Course Outcomes:

1. Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.
2. Develop the applications using object oriented programming with C++.
3. Implement the concept of inheritance and polymorphism.
4. Apply I/O streams and files to develop programs for real time problems.
5. Apply advance features like templates and exception handling to make programs supporting reusability and sophistication

UNIT -- I:

Concepts of OOP: Introduction to OOP, Procedural versus Object Oriented Programming, Principles, Benefits and applications of OOP.
C++ Basics: Overview, Program structure, namespace, identifiers, variables, constants, enumerations, operators, typecasting, control structures.

UNIT -- II:

C++ Functions: Simple functions Call and Return by reference, Inline functions, Overloading of functions, default arguments, friend functions.
Objects and classes: Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading.

UNIT -- III:

Inheritance: Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding, virtual base class.
Polymorphism: Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, implementing polymorphism.

UNIT -- IV:

I/O Streams: Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators.
File management: File stream, C++ File stream classes, File management functions, File modes, sequential and random access files.

UNIT -- V:

Templates: Function and class templates, overloading of template functions.
Exceptions: Basics of exception handling, exception handling mechanisms, throwing, catching mechanisms, rethrowing an exception.

Text Books:

1. The Complete Reference C++, Herbert Schlitz, TATA McGraw Hill, Fourth Edition, 2003.
2. Object Oriented Programming in C++, SauravSahay, Oxford University Press, Second Edition, 2012.
3. Object Oriented Programming with C++, Reema Thereja OXFORD higher Education.

Reference Books:

1. Object Oriented Programming with C++, E Balagurusamy, TATA McGraw Hill, Sixth Edition, 2013.
2. C++ Programming, Black Book, Steven Holzner, dreamtech
3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia
4. Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson.

II Year B.Tech. CSE/IT I-Sem.

ELECTRONIC DEVICES AND CIRCUITS

L	T	P	C
3	1	0	3

Course Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

1. To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET transistors and amplifier circuits.
2. To understand diode as rectifier. To study basic principle of filter circuits and various types.

Course Outcomes:

1. Understand and analyze the different types of diodes, operation and its characteristics Design and analyze the DC bias circuitry of BJT and FET Design biasing circuits using diodes and transistors.
2. To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

UNIT -I: P-N Junction Diode:

Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Special Purpose Electronic Devices: Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode, SCR and Semiconductor Photo Diode, UJT and Characteristics.

UNIT-II: Rectifiers and Filters:

The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π- Section Filters, Comparison of Filters, Voltage Regulation using Zener Diode.

UNIT-III: Bipolar Junction Transistor:

The Junction Transistor, BJT Symbol, Transistor Current Components, Transistor Construction, BJT Operation, Common Base, Common Emitter and Common Collector Configurations, Comparison of CB, CE, and CC Amplifier Configurations, Transistor as an Amplifier, Limits of Operation , BJT Specifications. **BJT Small Signal Model:** BJT Hybrid model, Determination of h-parameters from Transistor Characteristics, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-IV: Transistor Biasing and Stabilization:

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{be} and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability,

UNIT-V: Field Effect Transistor and Biasing:

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, FET as Voltage Variable Resistor, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes. Biasing FET, Comparison of BJT and FET.

TEXT BOOKS:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit, 2 Ed., 1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learning, 2013
3. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford.

REFERENCES:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits – B. P. Singh, Rekha Singh, Pearson, 2Ed, 2013.
4. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.
5. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt. Ltd.
6. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

II Year B.Tech. CSE/IT – I Sem.

DATA STRUCTURES LAB

L	T	P	C
0	0	3	2

Course Outcomes:

1. Develop the programs on stacks and its applications.
2. Demonstrate the operations on trees.
3. Demonstrate the implementation of various advanced trees.
4. Design and implementation of programs on BST and Graph Traversals.

Part-A

1. Program to illustrate string built in functions
2. Program to evaluate postfix notations
3. Program to convert infix to postfix notation
4. Program to illustrate tree traversals
   a) In order b) Pre order c) Post order
5. Program to illustrate insertion, deletion and searching in Binary Search Tree.
6. Program to illustrate Graph traversals
   a) Breadth First Search
   b) Depth First Search
7. Program to illustrate Insertion, deletion and Rotation on AVL Trees.

Part-B

1. Program to illustrate Function Overloading to calculate area of a circle, rectangle and square
2. Program to illustrate virtual function
3. Program to illustrate default constructor, parameterized constructor and copy constructors
4. Program to illustrate single Inheritance, multiple inheritance, multilevel inheritance, hybrid inheritance
5. Program to illustrate run time polymorphism, compile time polymorphism
6. Program to illustrate Operator Overloading
   a) Unary Operator b) Binary Operator
7. Program to illustrate Exception Handling Mechanisms using try, catch, throw keywords.
8. Program to illustrate formatted and unformatted I/O streams.

II Year B.Tech. CSE/IT – I Sem

Electronic Devices & Circuits and Digital Logic Design Lab

L	T	P/D	C
0	0	3	2

PART A:

List of Experiments (EDC)

1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration and h-parameter calculations.
6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
7. FET characteristics.
8. UJT Characteristics

PART B:

List of Experiments (DLD)

1. Verify the functionality of logic gates &Flip-flops
2. Verification of De-Morgan's laws
3. Implementation and verification of full adder and full subtractor using logic gates.
4. Implementation and verification of 4X1 multiplexer & Demultiplexer using logic gates.
5. Implementation and verification of 2X4 Decoder and 1X4 De-multiplexer using logic gates.
6. Implementation of given function and verification using IC 74LS151 (8X1 multiplexer).
7. To design and verify the 4-bit ripple counter & decade counter
8. Verify the functionality of 4-bit magnitude comparator using IC 74LS85.
9. Verify the functionality of Universal Shift Register IC 74LS194/195

Note: Minimum 6 experiments from each part.

Part – C

Syllabi of

B.Tech., II Year II Semester

II Year B.Tech. CSE/IT – II Sem

DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
4	1	0	4

Course Objectives:

1. Understand the asymptotic performance of algorithms.
2. Be familiar with graph algorithms and dynamic programming.
3. Understand the concept of back tracking, branch and bound.
4. Introducing the concept of NP-complete problems and different techniques to deal with them.
5. To understand the concepts of divide and conquer and greedy approaches.

Course Outcomes:

1. Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm.
2. Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm
3. Apply the dynamic-programming paradigm and recite algorithms that employ this paradigm.
4. Apply the concept of back tracking, branch and bound paradigm for real time problems.
5. Analyze the complexity of problems and differentiate that in terms of P and NP problems with examples.

UNIT I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Disjoint Sets-disjoint set operations, union and find operations.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT II

Graphs: Breadth First Search, Depth First Search, spanning trees, connected and bi-connected components

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT V

Lower Bound Theory: Comparison Trees, NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

References:

1. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.
2. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.

II Year B.Tech. CSE/IT –II Sem
COMPUTER ORGANIZATION

L	T	P	C
3	1	0	3

Course Objectives:

1. Understand instruction format, life cycle and CPU Architecture and Organization
2. Know the basic Architecture of Microprocessor.
3. Understand different types of I/O interfaces.
4. Familiar with the concepts of pipelining techniques.
5. Understand the Multiprocessor concepts

Course Outcomes:

1. Understand the basic organization of computer and different instruction formats and addressing modes.
2. Analyze the concept of pipelining, segment registers and pin diagram of CPU.
3. Write simple programmes on assembly language.
4. Evaluate various modes of data transfer between CPU and I/O devices.
5. Examine various inter connection structures of multi processors.

UNIT -- I:

Instruction: Instruction Definition, instruction cycle, instruction storage, types of instruction formats (Zero, one, two and three address).
Addressing modes: mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems.

UNIT -- II:

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, segment register and generation of 20 bits address, concept of address, data, control and systems bus, Types of flags.

UNIT -- III:

CPU and Main Memory interface, programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP). **Micro-programmed control:** control memory, address sequencing, micro program example and design of control unit.

UNIT -- IV:

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus. **Modes of Transfer:** Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority. **DMA:** DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT -- V:

Multi Processors: Characteristics of Multi Processor; **Interconnection structures:** Time shared common bus, multiport memory, crossbar switch, multi-stage switching network; **Introduction to Flynn's classification:** SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

1. Computer System Architecture – M. Morris Mano, Third Edition, Pearson/PHI, 2011.
2. Microprocessor and Interfacing – Douglas V Hall, Second Edition, TATA McGraw Hill, 2006.

Reference Books:

1. Computer Organization – Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings, 6th Edn. Pearson/PHI.

DATABASE MANGEMENT SYSTEMS
II Year B.Tech. CSE –II Sem

L	T	P	C
4	1	0	4

Course Objectives:

1. To provide a sound introduction to Database management systems, Databases and its applications,
2. To familiarize the participant to give a good formal foundation on the relational model of data
3. To present SQL and procedural interfaces to SQL comprehensively
4. To give an introduction to systematic database design approaches conceptual design, logical design, schema refinement and physical design
5. To introduce the concepts of transactions and transaction process and the issues and techniques relating to concurrency and recovery manager.

Course Outcomes:

1. Design Entity-Relationship Model for enterprise level databases.
2. Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.
3. Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement
4. Use of suitable Indices and Hashing mechanisms for real time implementation.
5. Ability to analyze various concurrency control protocols and working principles of recovery algorithms.

UNIT-I

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View of Data, Database Language, Database Design, Database Architecture, Database Users and Administrators.

Introduction to the Relation Models and Database Design using ER Model: Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations, Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Features.

UNIT-II

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Integrity Constraints, SQL Data Types, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Sub Queries, Nested Sub queries, Modification of the Database.

Intermediate and Advanced SQL: Join Expressions, Views, Authorization, Advanced Aggregation Features, Cursers, Functions and Procedures, Triggers.

UNIT-III

Formal Relational Query Languages: The Relational Algebra, the Tuple Relational Calculus, the Domain Relational Calculus.

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Decomposition Using Multi valued Dependencies, More Normal Forms.

UNIT-IV

Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

Transactions: Transaction Concept, a Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

UNIT-V

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multi version schemes.

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", 6th Edition, Tata McGraw-Hill.
2. Raghu Rama Kirshna, Johannes Gehrk, "Database Management System" Tata McGraw Hill 3rd Edition.

Reference Books:

1. Peter Rob & Carlos Coronel "Database System Concepts" Cengage Learning.
2. RamezElmasri, Shamkanth B. Navrate"Fundamentals of Database Systems "7th Edition, Pearson Education.
3. C.J. Date "Introduction to Database Systems" Pearson Education

II Year B.Tech. CSE/IT –II Sem
SOFTWARE ENGINEERING

L	T	P	C
3	1	0	3

Course Objectives:

1. Understand the framework activities for a given project.
2. Choose a process model to apply for given project requirements.
3. Design various system models for a given scenario.
4. Design and apply various testing techniques.
5. Understand metrics for Process and Products.

Course Outcomes:

1. Choose a process model to apply for given project requirements.
2. Analyze and apply the framework activities for a given project.
3. Design various system models for a given scenario.
4. Design and apply various testing techniques.
5. Understand metrics for Process and Products.

UNIT I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

UNIT II:

Process models: The waterfall model, Incremental process models, Evolutionary process model, agile process. Software Requirements: Functional and non-functional requirements, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management

UNIT III:

System models: Context Models, Behavioral models, Data models, Object models, structured methods. Design Engineering: Design process and Design quality, Design concepts, the design model, Modeling component level design: design class based components, conducting component level design. Performing User interface design: Golden rules.

UNIT IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, Product metrics : Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for maintenance.

UNIT V:

Metrics for Process and Products: Metrics for software quality. Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

References:

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely.
3. Systems Analysis and Design- ShelyCashmanRosenblatt, Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, the McGraw-Hill Companies.

II Year B.Tech. CSE –II Sem
JAVA PROGRAMMING

L	T	P	C
4	1	0	4

Course Objectives:

1. Understand the concept of OOP and learn the basic syntax and semantics of the Java language and programming environment.
2. Be familiar with the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
3. Understand Exceptional handling and multithreading concepts.
4. Be familiar with GUI applications.

Course Outcomes:

1. Design, write and test a java program to implement a working understand the fundamental concepts of the object oriented paradigm and their implementation in the Java programming language.
2. Write code to define classes and interfaces that uses class libraries such as java.lang, java.util, java.io. Use exception handling and multithreading in programs.
3. Develop GUI applications.
4. Give object oriented solutions for the complex and real world problems.

UNIT -- I:

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming- Objects and Classes, Data abstraction and encapsulation, inheritance , Polymorphism, Data binding, Message Communication, Benefits of OOP, Applications of OOP. **Java Basics** History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, Strings.

UNIT -- II:

Inheritance – Base class object, subclass, subtype, substitutability, forms of inheritance-specialization, specification, construction, extension, limitation, combination, Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, Object class.

Packages and Interfaces : Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, File, Byte Streams, Character Streams, Stream I/O.

UNIT -- III: Exception handling - Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Package java.util, The Collection Interface, list interface, Queue interface, The Collection class: LinkedList Class, HashSet Class. Tree Set Class, StringTokenizer, Date, Random, Scanner.
Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

UNIT -- IV:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.
AWT: class hierarchy, component, container, panel, window, frame, canvas, graphics, Layout Manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT -- V:

AWT controls: Labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar.
Applets – Concepts of Applets, differences between applets and applications, life cycle of an apple, create applets, passing parameters to applets.
JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

1. Java- the complete reference, Seventh edition, Herbert Schildt, Tata McGraw Hill.
2. Database Programming with JDBC&JAVA, Second Edition, George Reese, O'Reilly Media.
3. Programming in JAVA Second Edition, OXFORD Higher Education.

Reference Books:

1. Thinking in Java Fourth Edition, Bruce Eckel
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

II Year B.Tech. CSE/IT –II Sem.
ENVIRONMENTAL SCIENCE
Common to all Branches

L	T	P	C
2	1	0	2

Course Objectives:

- Develop an understanding on the importance of environmental protection.
- Understanding the significance of ecological balance for sustainable development.
- The ability to apply quantitative reasoning and practical skills to environmental problems.

Course Outcomes:

- To enable the students to realize the importance of the sustainable use of natural resources.
- To make the students aware of the impacts of human actions on environment and measures to minimize and mitigate them.
- To enable the students to become aware of the current issues and problems pertaining to the environment.

UNIT I:

Ecosystems:
Definition, Scope and Importance of ecosystem; Classification of ecosystems, Structure and Functions of ecosystem: Food chains, Food Web and Ecological Pyramids, Flow of energy; Bioaccumulation and Biomagnifications; Ecosystem Value services and Carrying Capacity. **BIODIVERSITY AND BIOTIC RESOURCES**: Introduction, Definition, levels of Biodiversity, Value of biodiversity, Hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT II:

Natural Resources: Classification of Resources, **Water resources**: use and over utilization of surface and ground water, Floods and Droughts, Dams: benefits and problems. **Energy resources**: growing energy needs, Renewable Energy Sources – Solar, Hydro-Power, Wind, Tidal, Geo-Thermal, Biomass, Bio-fuels, Hydrogen as a fuel and Biogas and Non Renewable Energy – Coal, Petroleum, LPG, Natural Gas, SNG, CNG. **Land resources**: land as a resource, land degradation – Landslide and Soil Erosion; **Forest Resources – Uses and Exploitation.**

UNIT III:

Environmental Pollution and Control: Types of Pollution, Sources, Effects and Control measures and Quality Standards for

1. Air Pollution
2. Water Pollution
3. Soil Pollution
4. Noise Pollution

Solid, Hazardous, Biomedical and e-Waste Management and Handling Rules, Nuclear Hazards – Case Studies. **Waste water treatment methods**: Effluent treatment plants (ETP), Sewage treatment plants (STP), Common and combined effluent treatment plants (CETP).

UNIT IV:

Global Environmental Problems And Global Efforts: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment; Ozone depletion and Ozone depleting substances (ODS); Aid Rains, Deforestation and Desertification.

Environmental Impact Assessment (EIA): Definition of Impact: classification of impacts, Methods of baseline data acquisition. Impacts on different environmental components; Environmental Impact Statement (EIS). Environmental Management Plan (EMP) - Rain Water Harvesting, Water Shed Management and Bioremediation.

UNIT V:

Environmental Policy, Legislation, Rules And Regulations: Environmental Protection act, Legal aspects Air (Prevention and Control of pollution) Act- 1981, Water (Prevention and Control of pollution) Act-1974, Forest Conservation Act, Wildlife Act 1972. **Towards Sustainable Future**: Concept of Sustainable Development, Threats to Sustainability: Population and its explosion, Crazy Consumerism, Over-exploitation of resources; Environmental Education, Role of Civil Societies, Role of IT in Environment, Smart Cities, Concept of Green Building, Low Carbon Lifestyle, Life cycle assessment and Ecological Foot Print.

TEXT BOOKS:

1. Text Book of Environmental Studies by Anubha Kaushik (4th Edition), New age International Publishers.
2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press.
3. Environmental studies, From crisis to cure by R.Rajagopalan, 2005

REFERENCE BOOKS:

1. Environmental Science: Towards a Sustainable Future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Science by Daniel B. Botkin & Edward A. Keller, Willey INDIA Edition.
3. Text book of Environmental Science and Technology by M.Anji Reddy 2007

II Year B.Tech. CSE–II Sem.

JAVA PROGRAMMING LAB

L	T	P	C
0	0	3	2

Course Outcomes:

1. Familiarize with Java Environment and use of Java Development Kit for the creation and execution of java programs
2. Develop programs on various concepts like data abstraction & data hiding, encapsulation, inheritance, polymorphism.
3. Create and use threads, handle exceptions and write applets.
4. Develop the programs using interfaces, inner classes, wrapper classes and generics.
5. Develop GUI applications.

Week 1:-

1) Write a program to find total, average of given two numbers by using function with default arguments, static data members and this keyword?

2) Write a program to illustrate class and objects (Banking operations)

Week 2:-

3) Write a program to illustrate constructors? (Inventory of Books)

4) Write a program to create a class complex with necessary operator overloading and type conversion such as integer to complex, complex to double.

Week 3:-

5)Write a program that randomly generates complex numbers and write two numbers per line in a file along with an operator(+,-,P,*,/) .The numbers are written to file in the format (a+ib)

6) Write a program to read one line at a time, perform the corresponding operation on two complex numbers read, write the result to another file (one per line)

Week 4:-

7) Write a program to illustrate inheritance (Student Evaluation)

8) Write a java program to handle the situation of exception handling.

Week 5:-

9) Write a java program to demonstrate the concept of polymorphism.

10) Write a java program to illustrate Method Overriding?

Week 6:-

11) Write a java program to illustrate Method overloading of assignment operator?

12) Write a program to illustrate Array Manipulation?

Week 7:-

13) Write a program to illustrate Synchronization?

14) Write a program to StringTokenizer?

Week 8:-
15) Write a program to implement the concept of User defined Exceptions.
16) Write a program to illustrate the use of creation of packages.

Week 9:-
17) Write a program to illustrate Multithreading and Multitasking?
18) Write a program to illustrate thread priorities.

Week 10:-
19) Write a program to illustrate applet concept.

Week 11:-
20) Write a program to illustrate Event Handling (keyboard, Mouse events)

Week 12:-
21) Write a program to develop a calculator application using AWT.

Week 13:-
22) Write a program to illustrate JDBC.

II Year B.Tech. CSE/IT –II Sem.

DATABASE MANAGEMENT SYSTEMSLAB

L	T	P	C
0	0	3	2

Course Outcomes:

1. Use the SQL commands such as DDL, DML, DCL, TCL to create, manipulate, access data from database objects and providing authorization to access database by different users.
2. To apply various integrity Constraints on the database tables for preserving the integrity of the database.
3. Design and implement PI/SQL programs which include procedures, functions, cursor and triggers.

1. Database Schema for a customer-sale scenario

Customer (**Cust id: integer**, cust_name: string)
Item (**item_id: integer**, item_name: string, price: integer)
Sale (**bill_no: integer**, bill_data: date, **cust_id: integer**, **item_id: integer**, qty_sold: integer)
For the above schema, perform the following—

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the bills for the current date with the customer names and item numbers
d) List the total Bill details with the quantity sold, price of the item and the final amount.
e) List the details of the customer who have bought a product which has a price>200
f) Give a count of how many products have been bought by each customer
g) Give a list of products bought by a customer having cust_id as 5
h) List the item details which are sold as of today
i) Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount.
Create a view which lists the daily sales date wise for the last one week

2. Database Schema for a Student Library scenario

Student(**Stud_no : integer,**Stud_name: string) Membership(**Mem_no: integer**, **Stud_no: integer**)
Book(**book_no: integer**, book_name:string, author: string)
Iss_rec**(iss_no:integer**, iss_date: date, **Mem_no: integer**, **book_no: integer**)

For the above schema, perform the following

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the student names with their membership numbers
d) List all the issues for the current date with student and Book names
e) List the details of students who borrowed book whose author is CJDATE
f) Give a count of how many books have been bought by each student
g) Give a list of books taken by student with stud_no as 5
h) List the book details which are issued as of today
i) Create a view which lists out the iss_no, iss _date, stud_name, book name
j) Create a view which lists the daily issues-date wise for the last one week

3. Database Schema for a Employee-pay scenario

Employee (**emp_id : integer,** emp_name: string) department (**dept_id: integer,** dept_name:string) Paydetails (**emp_id: integer, dept_id: integer,** basic: integer, deductions: integer, additions: integer, DOJ: date) payroll **(emp_id: integer,** pay_date: date).

For the above schema, perform the following:

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List the employee details department wise
d) List all the employee names who joined after particular date
e) List the details of employees whose basic salary is between 10,000 and 20,000
f) Give a count of how many employees are working in each department
g) Give a names of the employees whose netsalary>10,000
h) List the details for an employee_id=5
i) Create a view which lists out the emp_name, department, basic, dedeuctions, net-salary.
j) Create a view which lists the emp_name and his netsalary.

4. Database Schema for a Video Library scenario

Customer (cust_no: integer, cust_name: string) Membership (**Mem_no: integer, cust_no: integer**) Cassette (**cass_no:integer,** cass_name:string, Language: String) Iss_rec(**iss_no: integer,** iss_date: date, **mem_no: integer, cass_no: integer**)

For the above schema, perform the following

a) Create the tables with the appropriate integrity constraints
b) Insert around 10 records in each of the tables
c) List all the customer names with their membership numbers
d) List all the issues for the current date with the customer names and cassette names
e) List the details of the customer who has borrowed the cassette whose title is " The Legend"
f) Give a count of how many cassettes have been borrowed by each customer
g) Give a list of book which has been taken by the student with mem_no as 5
h) List the cassettes issues for today
i) Create a view which lists outs the iss_no, iss_date, cust_name, cass_name
j) Create a view which lists issues-date wise for the last one week.

5. Database Schema for a student-Lab scenario

Student(**stud_no: integer,** stud_name: string, **class: string**) Class(**class: string,descrip: string**) Lab(**mach_no: integer,** Lab_no: integer, description: String) Allotment(**Stud_no: Integer, mach_no: integer, dayof week: string)**

For the above schema, perform the following

a) List all the machine allotments with the student names, lab and machine numbers
b) List the total number of lab allotments day wise
c) Give a count of how many machines have been allocated to the 'CSE' class
d) Give a machine allotment details of the stud_no 5 with his personal and class details
e) Count for how many machines have been allocated in **Lab_no 1** for the day of the week as "Monday"
f) How many students class wise have allocated machines in the labs
g) Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek
h) Create a view which lists the machine allotment details for "Thursday".

6. Create a cursor, which displays all employee numbers and names from the EMP table.

7. Create a cursor, which update the salaries of all employees as per the given data.

8. Create a cursor, which displays names of employees having salary > 50000.

9. Create a procedure to find reverse of a given number

10. Create a procedure to update the salaries of all employees as per the given data

11. Create a procedure to demonstrate IN, OUT and INOUT parameters

12. Create a function to check whether given string is palindrome or not.

13. Create a function to find sum of salaries of all employees working in depart number 10.

14. Create a trigger before/after update on employee table for each row/statement.

15. Create a trigger before/after delete on employee table for each row/statement.

16. Create a trigger before/after insert on employee table for each row/statement.

Part – D

Syllabi of

MANDATORY COURSES

INTELLECTUAL PROPERTY RIGHTS AND CYBER LAWS

L	T	C
2	0	0

Course Objectives:

1. To make students familiar with Intellectual Property Rights.
2. To understand innovations in engineering and other domains.
3. To be familiar with patents, copyrights and various acts related to innovations.

UNIT - I:

Introduction to Intellectual property Rights (IPR):

Introduction, Types of Intellectual Property Rights, International Organizations, Agencies and Treaties, Importance of Intellectual Property Rights.

UNIT - II:

Trade Marks:

Purpose and function of Trademarks, Acquisition of Trade Mark Rights, Protectable Matter, Selecting And Evaluating Trade Mark, Trade Mark Registration Processes.

UNIT - III:

Copy rights Law:

Fundamental of Copy Right Law, Originality of Material, Rights of Reproduction, Rights to Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice of Copy Right, International Copy Right Law.

Patents Law:

Foundation of Patent Law, Patent Searching Process, Ownership Rights and Transfer

UNIT - IV:

Trade Secrets:
Trade Secrete Law, Determination of Trade Secrets Status, Liability for Misappropriations of Trade Secrets, Protection for Submission, Trade Secret Litigation.
Unfair competition: Misappropriation Right of Publicity, False Advertising.

UNIT - V:

Cyber Law:

Cyber Crime, Information Security, Cyber Criminals, Classification of Cyber Criminals - Legal Perspectives - Indian Perspectives- Cyber Crimes and Indian ITA 2000, Global Perspective on Cyber Crime - Cyber Crime Era.

Course Outcomes:

Upon completion of the course, the students are expected to:

1. To define various terms related to Intellectual Property Rights.
2. To understand the process of patent, copyrights and related procedures.
3. To analyze the situation of IPR in the Indian context with that of global scenario.
4. To understand the patenting process through various case studies.

TEXT BOOKS & REFERENCES:

1. Deborah, E. Bo Choux, Intellectual Property Right, Cengage Learning.
2. Prabuddha Ganguli, Intellectual Property Right - Unleashing the Knowledge Economy, Tata Mc Graw Hill Publishing Company Ltd.
3. Nina Godbole and Sunitha Belapure, "Cyber Security" Wiley India 2012.

PROFESSIONAL ETHICS, HUMAN VALUES AND SELF DEVELOPMENT

L T C
2 0 0

Course Objectives:

a. To offer the students an appropriate set of values to live by
b. To help them achieve a balanced life with appropriate attitudes and behaviour
c. To ensure harmonious life with sustained happiness and prosperity
d. To create awareness on Ethical human conduct, Engineering Ethics, Social responsibility as an engineer.

Course Outcomes:

1. Cultivate the habit of Introspection; Inspirations from within and outside and journal writing to become Successful Engineers with hopes of a better human being.
2. Ethical Responsibilities of Engineers while - dealing with the issues.
3. To maintain work life –balance and societal well being.
4. Develop Right thinking and understanding

UNIT – I

Course Introduction to Values: Need, Guidelines, Content and Educational Process, Application of values, Universal values. Natural Acceptance. Self Exploration – Meditation- self exploration. Continuous Happiness and Prosperity - Right thinking and understanding. Ambition and Aspiration.

UNIT - II:

Harmony in the Human Being:

Harmony in Myself: Human being as a co-existence of 'I' and the material 'Body'. Needs of Self ('I') and 'Body'. The Body as an instrument of 'I' (I being the Doer, Seer and Enjoyer). Harmony of I with the Body, Correct Appraisal of Physical needs

UNIT - III:

Harmony in the Family, Society and in Nature:

Harmony in Human - Human Relationships: Harmony in the Family, Values in Human - Human Relationships, Trust, Respect and other Salient Values in Relationships. Harmony in the Society, Universal Harmony Order.

Harmony in the nature and Existence: Whole existence as Co-existence: Inter-connectedness and Mutual fulfillment among the four orders of nature - Recyclability and Self-regulation in nature.

UNIT - IV:

Professional Ethics:

Introduction, Profession, Professionals, Professionalism, Professional's- roles and risks, Professional Accountability, Ethics in Engineering Profession, Roles of Engineers, Balanced outlook on Law and Responsibilities as Citizens, Professional Responsibilities, Professional Rights.

UNIT - V:

Self Development:

Behavior and Attitude, Stress Management- Types of Stress, Self Management, Choices we make, Excellence.

Meditation: Importance of Meditation, Observation, Introspection, Contemplation, Concentration, Relaxation, Systematic Practice of Meditation. Inner Cleaning, Need to purify our Conscience and develop Purity in Thoughts and Actions Journal Writing: Uses and Self Development.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, g p Bagaria, 2009, a foundation course in human values and professional ethics.
2. Professional ethics by R Subramanian Oxford press
3. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
4. Self development modules from heartfulness institute (content.heartfulness.org).
5. Prof. K Subba Raju 2013, Success secrets for engineering students, Smart student publication 3rd edition.

REFERENCE BOOKS:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E. F. Schumancher, 1973, small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.

PROFESSIONAL COMMUNICATION

L T C
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Introduction:

The world is in need of effective and efficient professionals. Technical students are to be equipped with Professional Communication skills to enable them to face the growing employment demands. The course has been introduced to bridge the gap between communication skills of ELCS and ACS.

Course Objectives:

To enable a student:

- speak & write intelligible English
- understand professional etiquette and learn appropriate mannerism
- learn about leadership, team building skills and to solve problems by taking decisions
- to present effectively
- knowing his/her strengths and overcoming weaknesses

Course Outcomes:

A student learns:

- to speak and write appropriate English
- the professional demands
- to solve problems and take decisions
- requisite professional skills

Unit: I

Academic Vocabulary and Grammar

Exercises on: Correction of sentences
Tenses, Articles, Prepositions, etc.
Synonyms, Antonyms, One word substitutes, Idioms & Phrases

Unit: II

Self Appraisal

Self Introduction,
SWOT Analysis,
Goal setting
Personality Development

Unit: III

Professional Etiquette

Etiquette
Mannerism
Positive Attitude
Behavioral Traits

Unit: IV

Team Building

Leadership skills
Team Work
Decision Making/ Problem Solving / Conflict managements
Case Study

Unit: V

Presentation Skills

Poster Presentation
Oral Presentation

References:

1. Rao,M.S. Soft Skills Enhancing Employability.New Delhi: I.K.Publishing House,2010.
2. Rao, Nageshwar. Communication Skills. New Delhi: Himalaya Publishing House Pvt. Ltd, 2008.
3. Ashrif Rizvi. Effective Technical Communication, Tata Mc Grahill, 2011.
4. Daniel G. Riordan & Steven E. Pauley. Technical Report Writing Today, Biztantra Publishers, 2005.
5. David A McCurry & Joanne Buckely, Handbook for Technical Writing CENGAGE Learning 2008.
6. Raymond Murphy's English Grammar with CD, Murphy, Cambridge University Press, 2012.
7. William Standard. Living English Structures- Allen-Pearson, 2011.
8. S M Guptha. Current English Grammar and Usage, PHI, 2013.
9. Krishna Swami. Modern English Grammar-, McMillan, 2009.
10. Anjana Agarwal. Powerful Vocabulary Builder, New Age International Publishers, 2011.

DISASTER MANAGEMENT

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Course Objectives:

- To provide knowledge related to the broad field of environmental risk assessment.
- Steps involved in the risk assessment process, including statistical characterization of observed data.
- Knowledge about tools that can be used in defining environmental risks, particularly as related to human health.
- To develop practical skills in disaster mitigation, planning, response and post disaster rehabilitation, particularly related to health and public health.

Course Outcomes:

- Develop an understanding of the key concepts, definitions a key perspectives of all Hazards Emergency Management
- Understand the Emergency/Disaster Management Cycle
- Have a basic understanding for the history of Emergency Management
- Develop a basic under understanding of Prevention, Mitigation, Preparedness, Response and Recovery
- Develop a basic understanding for the role of public and private partnerships

UNIT-I

Introduction to the Different Types of Disasters:

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion.

Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT-II

Environment and Disasters:

Environment, ecosystem and disasters. Climate change – issues and concerns. Industrial hazards and safety measures. Post disaster impact on environment. Impact of developmental projects on disaster risk. Aspects of environmental management for disaster risk reduction. Environmental Impact Assessment (EIA).

UNIT-III

Disaster Risk Mitigation:

Disaster risk assessment (Hazard-Vulnerability-Capacity analysis), Hazard mapping and forecasting. Principles and aspects of Disaster prevention Disaster mitigation Preparedness for damage mitigation and coping with disasters. Capacity building for disaster/damage mitigation (structural and non-structural measures). Contingency planning for damage mitigation of different hazards.

UNIT-IV

Disaster Management:

Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community – based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster responses; Police and other organizations. (2009).

UNIT-V

Planning for Disaster Rescue and Risk Reduction:

Community-hazard profile of the disaster site. DM cycle, Different phases of Disaster Management: Predisaster stage, Emergency stage, Post disaster stage. Implementation of different disaster management phase and Relief mechanism during different disaster stages including cyclones, earthquakes, fire accidents, Tsunami, landslides etc. Disaster Management Act (2005); Disaster Management Policy (2009).

TEXT BOOKS:

1. Disaster Mitigation: Experiences and Reflections by Pradeep Sahni, (2013).
2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman-Cengage Learning (2009).

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

An Autonomous Institution

Aziznagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

ACADEMIC REGULATIONS & SYLLABI (R15)

for

B.Tech (CSE) Third Year

(Applicable for the batches admitted from the Academic Year 2017-2018 onwards)

Part – A

ACADEMIC REGULATIONS (R15)

Definitions of Key Words

Academic Year: An academic year is referred as the period consisting of two consecutive semesters with 16 weeks each of instructional period followed by both the semester exams.

Course: A plan of study of a particular subject leading to an examination. All the courses need not carry the same weight. A course may be designed to comprise of lectures/ tutorials/ laboratory work/ field work/ outreach activities/ project work/ vocational training/ viva/ seminars/ assignments/ presentations etc. or a combination of some of these.

Choice Based Credit System (CBCS): Choice Based Credit System (CBCS) is the programme in which the students have a choice to choose from the prescribed courses and can learn at their own pace and the entire assessment is graded-based on a credit system.

Credit Point: It is the product of Grade Point and Number of Credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/ field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student of all the semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to 2nd decimal place.

Grade Point: It is a numerical weight allotted to each letter Grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An Educational Programme leading to the award of a Degree.

Semester: Each semester will consist of 16-18 weeks of academic work equivalent to 90 actual teaching days.

Semester Grade Point Average (SGPA): It is a measure of performance of the work done by the student in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to 2nd decimal place.

Transcript or Grade Card or Certificate: Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Types of Courses: The Courses in under B.Tech, program may be of three kind's viz., Core, Elective and Mandatory.

a) Core Course:-

There may be a Core Course in every semester, and are to be compulsorily studied by a student and is essential requirement for a given Programme.

b) Elective Course:-

Elective Course is a course which can be chosen by the students from a pool of subjects. In general, the elective course is,

- Supportive to the discipline of study
- Providing an expanded scope of the course subjects
- Nurturing student's proficiency/skill/Research.
- In case an elective is "Discipline centric" and is offered by the student's department itself, the elective is called **Professional elective**.
- On the other hand, if the elective is offered by the other departments or if the choice is given to the students to choose from other disciplines, the elective is called an "**Open Elective**."

c) Mandatory Courses (Non-Credit Courses)

AICTE considers that the Course work of certain subjects is essential and as such for the award of a B.Tech degree a pass in these subjects is made mandatory. Therefore, such types of courses are referred as **mandatory courses**. As the

AICTE also feels that only a familiarity with the subject content of these courses is essential, only a pass in each of these courses is required. Therefore, these subjects are included in the curriculum as non-Credit courses.

ACADEMIC REGULATIONS FOR B. TECH. (REGULAR)

Applicable for the students of B. Tech. (Regular) from the Academic Year 2017-18 onwards.

1. Courses of Study:

The following Four year Bachelor of Technology (B.Tech.) Programmes under Choice Based Credit System (CBCS) are offered with effect from the Academic Year 2017-18 onwards:

S. No.	Branch	Branch Code
I	Civil Engineering	01
II	Electrical and Electronics Engineering	02
III	Mechanical Engineering	03
IV	Electronics and Communication Engineering	04
V	Computer Science and Engineering	05
VI	Information Technology	12

2. Admission Procedure

2.1. Admissions will be done as per the norms prescribed by the Government of Telangana State.

2.2. The Government orders with regard to the admissions in vogue shall prevail.

2.3. The candidate should have passed the prescribed qualifying examination on the date of Admission.

3. Award of B. Tech. Degree

A student will be declared eligible for the award of B. Tech. Degree if he/she fulfills the following academic requirements:

3.1 The candidate shall register for 192 credits and secure all the 192 credits by securing a minimum CGPA of 5.0.

3.2 The external examination in all the subjects shall be conducted at the end of

each semester for all the eight semesters.

3.3 Students joining the B.Tech. Programme shall have to complete the programme within 8 years from the year of joining. Similarly, the students joining the B.Tech. Programme in the third semester directly through Lateral Entry Scheme (LES) shall have to complete the programme within 6 years from the year of joining otherwise they shall forfeit they will not be permitted to pursue their studies nor will be allowed to write the exams.

4. Course Structure:

41 The course shall be of four Academic year's duration, each academic year having two semesters. Each semester shall have a minimum **16** weeks of instruction, with a minimum of **90** Instructional Days per Semester.

42 **Credits:**

Credits shall be assigned to each Subject/ Courses in a L: T: P: C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) Structure, based on the following general pattern.

Type of course		**Clock hour/week**			
		L	**T**	**P**	**C**
Theory	1)	04	01	-	04
	2)	03	01	-	03
	3)	02	01	-	02
Practical		0	0	03	02
Drawing	1)	0	04	-	02
	2)	02	02	-	03
	3)	00	06	-	03
Mini project, Comprehensive Viva Voce Seminar, Major project		-	-	-	15

5. Attendance Requirements

5.1 A student is eligible to write the Semester End examinations only if he / she acquire a minimum of 75% of attendance in aggregate of all the

subjects/Courses in that Semester.

5.2 Condonation for the shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds with a documentary evidence approved by the Academic Committee.

5.3 A stipulated fee shall be payable towards condonation of attendance shortage.

5.4 Students, whose shortage of attendance is not condoned, are not eligible to write semester end examinations of that semester. Such students are detained and their registration for the examination stands cancelled.

5.5 A student detained due to shortage of attendance in a semester may seek re-admission into that semester, as and when offered, within four weeks from the date of the commencement of class work with the academic regulations of the batch into which he/she gets admitted.

5.6 A student will be promoted to the next semester if he/she satisfies the attendance requirement of the present semester.

5.7 For all mandatory, non credit courses offered in a semester, a "Satisfactory Participation Certificate" shall be issued to the student, only after securing 75% attendance in such course. Letter Grade shall be allotted for these courses.

The courses offered in 8 semesters spread over 4 years have been classified into 8 categories under CBCS

S.No.	Subject categories	No. of Credits
1	Humanities and Social Sciences (HS) Subjects, English, Management and the courses dealing with personality development	**15**
2	Basic Sciences (BS) Subjects including Mathematics, Physics and Chemistry	**30**
3	Engineering Sciences (ES), Engg. Workshop, Drawing, Fundamentals of computer Science and courses dealing with the basics of Electrical / Electronics/ Mechanical engineering	**30**
4	Professional Core (PC) Subjects, Courses dealing with the concerned engineering branch	**81**
5	Professional Elective (PE) Subjects. The students opt electives offered by the department	**12**

6	Open Elective (OE) Subjects. Courses offered by the other braches representing technically important subjects from emerging areas.	**9**
7	Project Work, Seminar and/ or Internship in Industry or elsewhere along with mini project.	**10+2+3 =15**
8	Mandatory Courses (MC)	**nil**
Total Number of credits		**192**

B.Tech Year wise distribution of credits under CBCS

S.No.	Year	Semester	Credits	Total
1	1st Year	I	25	**48**
		II	23	
2	2nd Year	I	24	**48**
		II	24	
3	3rd Year	I	24	**48**
		II	24	
4	4th Year	I	24	**48**
		II	24	
Total No. of Credits				**192**

6. Promotion regulations

6.1 A student shall be promoted from B.Tech., I Year to II Year only if he/she fulfills the academic requirements of securing 50% of total credits (24 credits out of 48 credits, upto I year II Semester), from all the examinations, whether or not the candidate takes the examinations.

6.2 A student shall be promoted from B.Tech., II Year to III Year only if he/she

fulfills the academic requirements of securing 50% of total credits (48 out of 96 credits, up to II year II semester, from all the examinations, whether or not the candidate takes the examinations.

6.3 A student shall be promoted from B.Tech., III year to IV year only if he/she fulfills the academic requirements of securing 50% of total credits (72 out of 144 credits) up to III year II semester), from all the examinations, whether or not the candidate takes the examinations.

7. Minimum Academic Requirements

The following minimum academic requirements are to be satisfied in addition to the requirements mentioned in item no.5.

7.1 A student shall be deemed to have satisfied the minimum academic requirements and has earned the credits allotted to each theory/practical/design/drawing subject/project and secured not less than 35% marks in Semester End Examination (SEE), and minimum 40% of marks in the sum total of the internal evaluation and end examination taken together.

7.2 The student has to pass the failed course by appearing the supplementary examination as per the requirement for the award of degree.

7.3 Students, who fail to earn 192 credits as indicated in the course structure within eight academic years from the year of their admission, shall forfeit their seat in B. Tech. course and their admission stands cancelled.

7.4 A student shall register and put up minimum Attendance and earn all 192 Credits for the award of degree.

7.5 When a student is detained due to shortage of attendance in any semester, no Grade allotments or SGPA/CGPA calculations will be done for that entire Semester in which a student got detained.

7.6 When a Student is detained due to lack of Credits in any year, he may be readmitted after fulfillment of the Academic Requirements, with the Academic Regulations of the Batch into which he gets readmitted for readmitted candidates. If there are any Professional Electives / Open Electives, the same may also be re-registered if offered. However, if those Electives are not offered in later Semesters, then alternate Electives may be chosen from the SAME set of Elective Subjects offered under that category.

7.7 After securing 192 Credits as specified for the successful completion of the entire UGP, an exemption of 6 Credits (two subjects with 3 credits each) may be permitted to drop resulting in 186 Credits for UGP performance

evaluation. Accordingly, the performance of student in 186 Credits shall be taken into account for the calculation of 'the final CGPA and shall be indicated in the Grade Card. However, the student's performances in the earlier individual Semesters, with the corresponding SGPA for which already Grade Cards are given, will not be altered. Further, the optional drop out for such 6 Credits shall not be allowed for i) Laboratory courses, ii) Industrial Training/ Mini-Project, iii) Seminar, iv) Major Project v) Open electives.

7.8 A student is eligible to appear in the End Semester Examination in any Subject/ Course, but absent at it or failed (thereby failing to secure P Grade or above), may reappear for that subject/Course at the supplementary exam as and when the examinations are conducted. In such cases, his Continuous Internal Evaluation(CIE) assessed earlier for that subject/Course will be carried over, and added to the marks to be obtained in the supplementary examinations, for evaluating the performance in that subject.

7.9 A student with a final CGPA (at the end of the UGP) < 5.00 will not be eligible for the Award of the Degree.

8 Evaluation - Distribution and weightage of Marks

8.1 The performance of a student in each semester shall be evaluated Subject-wise (irrespective of Credits assigned) for a maximum of 100 marks for Theory or Seminar or Drawing/Design or Industry Oriented Mini-Project or Minor Course, etc. For Practical's a maximum of 75 Marks shall be evaluated. However the B. Tech. Project work (Major Project) will be evaluated for 200 Marks. These evaluations shall be based on 25% CIE (Continuous Internal Evaluation) and 75% SEE (Semester End Examinations) and a Letter Grade corresponding to the % marks obtained shall be given.

8.2 For theory subjects the distribution shall be 25 marks for Continuous Internal Evaluation (CIE) and 75 marks for the Semester End- Examination (SEE).

8.3 For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination will be conducted for 20 marks and consists of Part-A (Short Answer Questions) for 6 marks and Part-B (Long Answer Questions) for 14 marks with duration of 90 Minutes. First midterm examination shall be conducted for 2.5 units of syllabus and second midterm Examination shall be conducted for remaining 2.5 units. The

Average marks secured by a student in I and II Midterm examination are considered and shall be taken as the final marks secured by the student towards Continuous Internal Evaluation in the theory subject.

84 In case a few students are absent due to health reasons or any other unavoidable circumstances, or if the performance of some of the students is very poor, all such cases will be referred to a standing committee consisting of the Controller of examinations (Chairman), HoD of the concerned dept. and the Academic coordinator. On the recommendation of the committee, a makeup test will be conducted on payment of fee fixed by the examination branch.

85 In order to improve the attendance and to encourage the students who are regular to the college, 5 marks in each subject will be given to the students as per the percentage of attendance shown in the table,

Table: - Marks for attendance

S.No	Percentage of attendance	Marks to be awarded
1.	Less than 75%	nil
2.	75% to 80%	3
3.	80% to 85%	4
4.	85% and above	5

86 The Semester End Examination will be conducted for 75 marks which consist of two parts viz. i). Part-A for 25 marks, ii). Part –B for 50 marks. Part-A is compulsory, which consists of ten questions (numbered from 1 to 10) two from each unit carrying 2/3 marks each. Part-B consists of five questions (numbered from 11 to 15) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice (i.e., there will be two questions from each unit and the student should answer any one question).

87 For practical subjects there shall be a continuous evaluation during the Semester for 25 marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the concerned laboratory teacher.

88 The Practical End Semester Examination shall be conducted with an external examiner and the laboratory teacher for 50 marks. The external examiner shall be appointed by the Principal from the panel of examiners recommended by Chairman, Board of Studies in respective Branches.

89 For the subject having design and/ or drawing, (such as Engineering Graphics, Engineering Drawing, and Machine Drawing), the distribution shall be 25 marks for Internal Evaluation (5 marks for day-to-day work and 20 marks for internal tests) and 50 marks for Semester End Examination. There shall be one internal test in a semester and shall be considered for the award of marks for internal test.

8.10. There shall be an industry-oriented mini-Project, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated in IV year I Semester at the time of practical exams. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, Head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

8.11. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding of the topic, and submit it to the department. It shall be evaluated by the departmental committee consisting of Head of the Department, Seminar Supervisor and a Senior Faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for the seminar.

8.12. There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a committee consisting of Head of the Department and two Senior Faculty members of the department and is evaluated for 100 marks. The Comprehensive Viva-Voce is intended to assess the students understanding of the subjects he studied during the B. Tech. course. There will be no External Examiner for the Comprehensive Viva-Voce.

8.13. Out of a total of 200 marks for the major project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester evaluation. The End Semester evaluation (viva-voce) shall be conducted by committee. The

committee consists of an external examiner, Head of the Department, the supervisor of project and a senior faculty member of the department. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year II Semester. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his project.

8.14 . The Laboratory marks and the sessional marks awarded by the faculty are subject to scrutiny by the Institution whenever/wherever necessary. In such cases, the sessional and laboratory marks awarded by the teacher will be referred to a College Academic Committee. The Committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved as per the University rules and produced before the Committees of the University as and when asked for.

8.15 Candidates shall be permitted to apply for recounting/revaluation of SEE scripts within the stipulated period with payment of prescribed fee.

9.0. Malpractice Rules

S.No.	Nature of Malpractices /Improper conduct during examinations	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion fromthe examination hall and cancellation of the performance in that subject only.

(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The hall ticket of the candidate is to be cancelled.

3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester end examinations.

5	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass.	Cancellation of the performance in that subject.
6	Refuses to obey the orders of the Chief Superintendent/Assistant Superintendent/any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer – in charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work & shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all Semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If a student of the college, who is not a candidate for the particular examination or any person not connected with the examination or college indulges in any type of malpractice or improper conduct mentioned in clauses 6 to 8.	Student of the college will be expelled from the examination hall and cancellation of the performance in that subject and all other subjects. If the candidate has already appeared including practical examinations and project work shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and a police case will be registered against him/her.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that the year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during Special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.

12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the head of Institute for further action for a suitable punishment.

All the cases pertaining to malpractices in examinations will be referred to a committee constituted by the Chief Controller of Examination and the committee will suggest action as per the guidelines mentioned above.

10. Grading Procedure:

10.1. Marks will be awarded to indicate the performance of each student in each theory subject, or Lab/Practical, or Seminar, or Project, or Mini-Project, Minor Course etc., based on the % marks obtained in CIE+SEE (Continuous Internal Evaluation + Semester End Examination, both taken together) as specified, and a corresponding Letter Grade shall be given.

10.2. As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades and corresponding percentage of marks shall be followed.

Letter Grade	Performance	Grade Points	% of marks Secured (Class Intervals)
O	Outstanding	10	Greater than or equal to 90%
A+	Excellent	9	80% and less than 90%
A	Very Good	8	70% and less than 80%
B+	Good	7	60% and less than 70%
B	Average	6	50% and less than 60%
C	Pass	5	40% and less than 50%

F	Fail	0	Below 40%
Ab	Absent	0	Absent

10.3. A student obtaining F Grade in any subject shall be considered 'Failed' and will be required to reappear as 'Supplementary Candidate' in the end Semester Examination (SEE), as and when offered. In such cases; his Internal Marks (CIE Marks) in those Subject(s) will remain same as those he obtained earlier.

10.4. A Letter Grade does not imply any specific % of Marks.

10.5. In general, a student shall not be permitted to repeat any Subject/Course (s) only for the sake of 'Grade Improvement' or 'SGPA/CGPA Improvement'. However, he has to repeat all the Subjects/Courses pertaining to that Semester, when he is detained.

10.6. A student earns Grade Point (GP) in each Subject/ Course, on the basis of the Letter Grade obtained by him in that Subject/ Course (excluding Mandatory non-credit Courses). Then the corresponding 'Credit Points' (CP) are computed by multiplying the Grade Point with Credits for that particular Subject/ course. Credit Points (CP) = Grade Point (GP) x Credits for a Course.

10.7. The Student passes the Subject/ Course only when he gets GP $\geq$ 4 (P Grade or above).

11. Registration/Dropping

11.1. Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the academic calendar. It is absolutely necessary for the student to register for courses in time.

11.2. The student has to register for a minimum of 20 credits and may register up to a maximum of 28 credits based on the advice of the Faculty Advisor. On an average, a student is expected to register for 24 credits.

11.3. A student at the end of II year II semester either having CGPA of $\geq$ 7.0

or having passed all previous courses in the first attempt with a minimum SGPA ≥ 5.0 is allowed to register for an additional course/ credits from the offered openelectives.

11.4. A series of open Electives will be offered to the students of III year I & II sems. and IV year I sem., which can be registered by the students as and when the notifications are issued at the end of II year II sem. and III year II sem. Prior permission for registration of open Electives as an additional course is compulsory.

11.5. A student would be allowed to register for an additional course only if he/she satisfies the prerequisites.

11.6. Departments will notify at the time of registration about the minimum number of students to be enrolled for a particular open elective to be offered.

11.7. Any student may be barred from registering for any course for specific reasons like disciplinary reasons or any other activities carried out by a student, which detrimental to the discipline of the college.

11.8. Dropping of Courses: Within four weeks after the commencement of the semester, the student may, in consultation with his / her faculty advisor, drop one or more courses without prejudice to the minimum number of credits. The dropped courses are not recorded in the Grade Card.

11.9. After Dropping, minimum credits registered shall be 20.

12. Earning of Credits

A student shall be considered to have completed a Course successfully and earned the credits if he/she secures an acceptable letter grade in the range 'O' to 'P'. Letter grade 'F' in any Course implies failure of the student in that Course and no credits earned.

13. Passing Standards:

13.1. A student shall be declared successful or 'passed' in a Semester, only when he gets a SGPA ≥ 5.00 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the entire UGP, only when he/she gets a CGPA ≥ 5.00; subject to the condition that he secures a GP ≥ 4 (P Grade or above) in every registered Subject/ Course in each Semester (during the entire UGP) for the Degree Award, as required.

13.2. (i) In spite of securing P Grade or above in some (or all) Subjects/ Courses in any Semester, if a Student receives a SGPA < 5.00 and/ or CGPA < 5.00 at the end of such a Semester, then he 'may be allowed' (on the 'specific recommendations' of the Head of the Department and

subsequent approval from the Principal) to be promoted to the next year in the course.

(ii) If a student gets **P** grade or an SGPA is less than 5, is eligible to re appear for one or more of the same Subject(s)/ course(s) in which he has secured P Grade(s) in that Semester, at the Supplementary Examinations to be held in the next subsequent Semester(s). In such cases, his Internal Marks (CIE Marks) in those Subject(s) will remain same as those obtained earlier. In these considerations, the newly secured Letter Grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

13.3. A Student shall be declared successful or 'passed' in any Non-Credit Subject/ Course, if he secures a 40% marks or **P** grade in the end sem exam conducted by the college along with the other examinations.

13.4. After the completion of each Semester, a Grade Card or Grade Sheet (or Transcript) shall be issued to all the registered students of that semester, indicating the Letter Grades and Credits earned. It will show the details of the courses registered (Course Code, Title, No. of Credits, Grade Earned etc.), Credits earned, SGPA, and CGPA.

14. Eligibility for the award of B.Tech. Degree

A student shall be eligible for award of the B.Tech degree if he/she fulfils all the following Conditions:

14.1. The students should successfully complete all the components prescribed in the Programme of study to which he/ she is admitted.

14.2. The student should also obtain CGPA greater than or equal to 5.0.

14.3. Not having any pending disciplinary action.

15. Evaluating of Grade Point Averages:

15.1. SGPA and CGPA the *credit index* can be used further for calculating the Semester Grade Point Average *(SGPA)* and the Cumulative Grade Point Average *(CGPA)*, both of which being important performance indices of the student. While *SGPA* is equal to the *credit index* for a semester divided by the total number of *credits* registered by the student in that semester, *CGPA* gives the sum total of *credit indices* of all the previous semesters divided by the total number of *credits* registered in all these semesters. Thus, The Grade Point Average (GPA) will be calculated

$$GPA = \frac{\sum CiGi}{\sum Ci}$$

according to the formula:

where Ci = number of credits for the course i, Gi = grade points obtained by the student in the course.

15.2. Semester Grade Point Average (SGPA) is awarded to candidates considering all the courses of the semester. Zero grade points are also included in this computation. SGPA is rounded off to TWO Decimal Places.

SGPA will be computed as follows;

$$\frac{\sum [(\text{Course } \textit{credits}) \text{ X } (\textit{Grade points})] \text{ (for all Courses passed in that semester)}}{\sum [(\text{Course } \textit{credits})] \text{ (for all courses registered in that semester)}}$$

15.3. To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time. CGPA is rounded off to TWO Decimal Places.

CGPA will be computed as follows:

$$\frac{\sum [(\text{Course } \textit{credits}) \text{ X } (\textit{Grade points})] \text{ (for all Courses passed up to that semester)}}{\sum [(\text{Course } \textit{credits})] \text{ (for all Courses registered until that semester)}}$$

CGPA is thus computed from the I Year First Semester onwards, at the end of each Semester, as per the above formula. However, the SGPA of I year I Semester itself may be taken as the CGPA, as there are no cumulative effects.

15.4. Illustrative Example:

An illustrative example given in below Table below indicates the use of the above two equations in calculating SGPA and CGPA, both of which facilitate the declaration of academic performance of a student, at the end of a semester and at the end of successive semesters respectively . Both of

them shall be normally calculated up to the second decimal position, so that the *CGPA,* in particular, can be made use of in rank ordering the student's performance in a class. If two students get the same *CGPA*, the tie should be resolved by considering the number of times a student has obtained higher *SGPA;* But, if it is not resolved even at this stage, the number of times a student has obtained higher grades like O, A, B etc shall be taken into account in rank ordering of the students in a class.

Year and Semester	Course No.	Credits	Grade	Grade Points	Credit Points
I Year I sem	XX101	5	A	8	40
I Year I sem	XX102	4	F	0	00
I Year I sem	XX103	3	A+	9	27
I Year I sem	XX104	4	F	0	00
I Year I sem	XX105	5	C	5	25
I Year I sem	XX106	5	P	4	20
Total		26(18*)			112
SGPA = 112/26 = 4.31			**CGPA = 4.31**		
I Year II Sem	XX107	5	B+	7	35
I Year II Sem	XX108	4	A	8	32
I Year II Sem	XX109	3	C	5	15
I Year II Sem	XX110	5	P	4	20
I Year II Sem	XX111	4	A+	9	36
I Year II Sem	XX112	2	F	0	00
I Year II Sem	Xx113	2	A	8	16
Total		25(23*)			154
SGPA = 154/25 = 6.16		**CGPA = 266/51 = 5.22**			

*Total No. of credits excluding those with 'F'; this is particularly important to keep track of the number of credits earned by a student up to any semester.

16. Award of Class

16.1. After a student has satisfied the requirements prescribed for the

completion of the program and is Eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

CGPA	Class Awarded	
≥8.00	First Class with Distinction	From the CGPA secured from 192 credits
≥6.50 - <8.00	First Class	
≥5.50 - <6.50	Second Class	
≥5.00 - <5.50	Pass Class	

16.2. The marks obtained in Internal Evaluation (IE) and Semester End Examination (SEE) will be shown in the memorandum of marks.

16.3. For the purpose of awarding first Class with Distinction (CGPA ≥ 8.0), the student must obtain the minimum required CGPA within 4 academic years or within 3 academic years in case of Lateral Entry candidates by clearing all the courses.

16.4. Candidates detained/ prevented from writing the semester end examinations due to any reason in any semester are not eligible for the award of First Class with Distinction. Such candidate's even if the CGPA ≥ 8.0 shall be placed in first class.

16.5. For the purpose of awarding First, Second and Pass Class, CGPA obtained in the examinations appeared within the maximum period allowed for the completion of course shall be considered as per the regulations.

16.6. A student with final CGPA (at the end of the UGP) < 5.00 will not be eligible for the award of the Degree.

16.7. The CGPA can be converted to equivalent percentage of marks by using the equation., % of Marks = (CGPA - 0.5) X 10.

17. Consolidated Grade Card

A consolidated grade card containing credits & grades obtained by the candidates will be issued after completion of the four years B. Tech Programme.

18. Withholding of Results

If a student is having any indiscipline related issues pending, the result of the student will be withheld and will not be allowed to move into the next semester. His/ her degree will be withheld in such cases and the matter will be referred to the academic council for final decision.

19. Transitory Regulations

19.1. Discontinued, detained for attendance, detained for want of credits, or failed students are eligible for readmission as and when the course is offered during the subsequent academic year as per the college admission procedures.

19.2. Students on transfer from a non- autonomous or from an autonomous college shall complete all the courses of the concerned programme not covered in the earlier organization. However, he/she should take the remaining courses in the programme along with the other students.

19.3. There shall be no branch transfers after the cutoff date of admissions made in the B.Tech. I year.

20. Transcripts

After successful completion of the total programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee.

21. Supplementary Examinations

In addition to the Regular end semester examinations, Supplementary Examinations for the previous semesters will be conducted along with end sem. Examinations. A student can appear for any number of supplementary examinations till he/she clears all courses which he/she could not clear in the first attempt. However the maximum stipulated period cannot be relaxed under any circumstances.

22. Graduation Ceremony

23.1. The College shall have its own annual Graduation Ceremony for the award of degree to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute.

23.2. The College shall institute Prizes and Awards to meritorious students, for being given away annually at the Graduation Ceremony.

24. Termination from the Program

The admission of a student to the program may be terminated and the student may be asked to leave the Institute in the following circumstances:

24.1. The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.

24.2. The student fails to satisfy the norms of discipline specified by the institute from time to time.

25. Non-Credit Courses (Mandatory Courses)

25.1. Requirement of 75% attendance as per the college regulations is compulsory of completing the mandatory courses.

25.2. Specified number of Mandatory Courses among the designated ones is compulsory requirement for all the students for the award of B.Tech. Degree.

25.3. Although these courses do not carry any credits, performance in these subjects is evaluated following the procedure adopted for other subjects with the same marks. However, their performance will be indicated in the student's memo of marks as Satisfactory/ Unsatisfactory.

25.4. Although mandatory courses are Non-Credit Course, all the students should secure a minimum of 40% marks in the end sem. exam conducted by the college along with the other examinations for the award of B.Tech., degree.

26. Amendments

The Academic regulations here under are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already undergoing the program) as may be decided by the Academic Council.

27. General

27.1. Wherever the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

27.2. The academic regulation should be read as a whole for the purpose of an interpretation.

27.3. In case of any doubt or ambiguity in the interpretation of the above rules,

the decision of the Academic Council is final.

27.4. The college may change the academic regulations, course structure & syllabi at any time.

ACADEMIC REGULATIONS FOR B. TECH. (LATERAL ENTRY STUDENTS)

Applicable for the students admitted into II year B. Tech. (Lateral Entry Scheme) from the Academic Year 2016-17 and onwards.

1. Eligibility for award of B. Tech. Degree (LES)

1.1 The LES candidates shall pursue a course of study for not less than three academic years and not more than six academic years.

1.2 The candidate shall register for 144 credits and secure 144 credits by securing a minimum CGPA of 5.0 from the exams. of B.Tech. II to IV year for the award of B.Tech. Degree.

1.3 The students, who fail to fulfill the requirement for the award of the degree in six Academic years from the year of admission, shall forfeit their seats. The attendance regulations of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

2. Promotion Rule

2.1. A student shall be promoted from B.Tech., II Year to III Year if he/she gets at least a minimum of 24 out of 48 credits, up to II year II semester, from all the examinations, whether or not the candidate takes the examinations.

2.2. A student shall be promoted from III year to IV year if he/she gets a minimum of 48 out of 96 credits, up to III year II semester, from all the examinations, whether or not the candidate takes the examinations.

2.3. A student shall register and put up minimum attendance in all 144 credits and

earn all 144 credits to be eligible for the award of B.Tech degree.

2.4. A student, who fails to earn 144 credits as indicated in the course structure within six academic years, shall forfeit his/her admission in B.Tech. Course.

3. Award of Class

A student, who satisfies all the requirements prescribed for the completion of the B.Tech. program, is eligible for the award of the said degree, in any one of the following four classes:

CGPA	**Class Awarded**	From the CGPA secured from 144 credits
≥8.00	First Class with Distinction	
≥6.50 - <8.00	First Class	
≥5.50 - <6.50	Second Class	
≥5.00 - <5.50	Pass Class	

4. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B.Tech. (Lateral Entry Scheme).

5. The malpractice rules and procedures for evaluating the SGPA and CGPA mentioned under points 9 - 27, are also applicable to the later entry students.

Part – B

Course Structure & Syllabi

of

B.Tech., III Year I Semester

B.TECH CSE III YEAR COURSE STRUCTURE

S. No.	Subject Code	Subject Name	L	T	P	Total Credits
B.Tech III YEAR I SEMESTER						
1	**A15512**	Linux Programming	3	1	0	3
2	**A15513**	Computer Networks	3	1	0	3
3	**A15514**	Operating Systems	3	1	0	3
4	**A15515**	Formal Languages & Automata Theory	3	1	0	3
5	**Professional Elective-1**	**A15517**-Principles of Programming Languages **A15518** – Human Computer Interaction **A15519** - Software Project Management	3	1	0	3
6	**Open Elective-1**	**A15520** – Java Programming **A15521** – Operating Systems	3	1	0	3
7	**A15588**	Operating Systems & Computer Networks lab through LINUX.	0	0	3	2
8	**A15089**	Advanced Communication Skills Lab	0	0	3	2
9	**MC-III**	Quantitative Methods & Logical Reasoning	2	1	0	2
		Total	20	7	6	**24**
B.Tech III YEAR II SEMESTER						
1	**A16522**	Web Technologies	3	1	0	3
2	**A16523**	Compiler Design	3	1	0	3
3	**A16525**	Data Warehousing & Data Mining	3	1	0	3
4	**A16018**	Managerial Economics & Financial Analysis	3	1	0	3
5	**A16526** **A16527** **A16528**	**Professional Elective-2** • Object Oriented Analysis & Design • Distributed Systems • Information Retrieval Systems	3	1	0	3
6	**Open Elective-2**	**A16529** - **A16530** -	3	1	0	3
7	**A16589**	Web Technologies & Case Tools Lab	0	0	3	2
8	**A16590**	Compiler Design & Data Mining Lab	0	0	3	2
9	**MC-IV**	Personality Development & Behavioural Skills	2	1	0	2
		Total	20	7	6	**24**

B.TECH CSE IV YEAR COURSE STRUCTURE

S. No.	Subject Code	Subject Name	L	T	P	Total Credits
B.Tech IV YEAR I SEMESTER						
1	**A17531**	Mobile Application Development	3	1	0	3
2	**A17532**	Information Security	3	1	0	3
3	**A17533**	Cloud Computing	3	1	0	3
4	**A17535** **A17537** **A17536**	**Professional Electives-3** 1.Big Data Analysis 2. Internet Of Things 3. Image Processing	3	1	0	3
5	**A17538** **A17540** **A17534**	**Professional Electives-4** 1.Advanced Databases 2.Computer Graphics 3.Software Testing Methodologies	3	1	0	3
6	**A17541** **A17542**	**Open Electives-3** 1. Information System For Engineers 2.Web Design	3	1	0	3
7	**A17593**	Mobile Application Development Lab	0	0	3	2
8	**Professional Elective Lab**	***A17594:*** Hadoop & Bigdata Lab ***A17595:*** Internet of Things Lab ***A17596:*** Image Processing With SCI Lab	0	0	3	2
9	**MP-1**	Mini Project	0	0	0	2
		Total Credits				**24**
B.Tech IV YEAR II SEMESTER						
1	**A18543**	Design Patterns	3	1	0	3
2	**A18545**	Machine Learning	3	1	0	3
3	**A18546**	Semantic and Social Networks	3	1	0	3
4	**TS**	Technical Seminar	0	0	6	2
5	**CVV**	Comprehensive Viva-Voce	0	0	0	2
6	**MP-II**	Project	**0**	**0**	**15**	11
		Total Credits				**24**

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LINUX PROGRAMMING

Course Objectives:

- To understand the Linux utilities, sed and awk concepts to solve problems.
- To implement in C some standard Linux utilities such as ls, mv, cp etc. using system calls.
- To understand process concepts and Interprocess communication in Linux.

Course Outcomes:

- To understand and make effective use of Linux utilities and Shell scripting language (bash) to solve problems.
- To develop the skills necessary for systems programming including file system programming, process and signal management.
- To apply basic skills of inter process communication
- To develop the basic skills required to write network programs using Sockets

UNIT - I:

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.
Sed-Scripts, Operation, Addresses, Commands, Applications, awk-Execution, Fields and Records, scripts, operations, patterns, actions, functions, using system commands in awk.

UNIT - II:

Shell programming with Bourne again shell(bash): Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing functions, debugging shell scripts.

UNIT - III:

Files : File Concept, File types, File System Structure, Inodes, File Attributes, Library Functions, kernel support for files, system calls for file I/O operations- open, create, read, write, close.
Directories: Creating, removing and changing Directories -mkdir, rmdir, chdir, obtaining current working directory. Scanning Directories-opendir, readdir, closedir, rewinddir functions.

UNIT - IV:
Process: Process Concept, process identification, process control - process creation, waiting for a process, process termination, Kernel support for process, zombie process, orphan process, Process APIs. Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT - V:
Inter Process Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, open and close library functions. Message Queues- APIs for message queues, Semaphores-APIs for semaphores Shared Memory: APIs for shared memory.
Sockets: Introduction to Sockets, Socket address structures, Socket system calls for connection oriented protocol and connectionless protocol.

TEXT BOOKS:

1. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
2. Unix and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
3. Unix Network Programming, W. R. Stevens, PHI.

REFERENCE BOOKS:

1. Unix System Programming using C++, T. Chan, PHI.
2. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
4. Unix shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.

5. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.
6. C Programming Language, Kernighan and Ritchie, PHI.

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COMPUTER NETWORKS

Course Objectives:

- To introduce the students with general overview of the concepts and fundamentals of computer networks.
- Familiarize the students with the standard models for the layered approach to communicate between machines in a network and the protocols of the various layers.

Course Outcomes:

- Understand the concept of network reference models.
- Able to analyze various connecting devices of a network and describe multichannel access protocols.
- Analysis of routing algorithm and congestion algorithms and classify IPV4 addressing scheme.
- Discuss application layer protocols.

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol

UNIT - II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT - IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:

The Internet Transport Protocols: UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition Pearson Education.
2. Understanding Communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J.David Irwin, CRC Press.
4. Computer Networking: Atop Down Approach Featuring The Internet, James F.Kurose, K.W.Ross, 3rd Edition, Pearson Education.

OPERATING SYSTEMS

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Course Objectives:

- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the different scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/ output, storage and file management
- To study different OS and compare their features.

Course Outcomes:

1. Understand the basic functions of Operating systems and concepts of process management.
2. Analyze the concepts of concurrency and Memory management.
3. Analyze the deadlock concepts and file system interface and management.
4. Understand the concepts of MASS storage structure and compare different protection methods of OS.

UNIT - I:

Operating System Introduction: Operating Systems Objectives and functions, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Virtual Machines.

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Scheduling Criteria, Scheduling algorithms, Thread scheduling, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation,

Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms, Thrashing.

UNIT - IV:

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management.

UNIT - V:

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

Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH

III Year B.Tech. CSE – I Sem

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FORMAL LANGUAGES AND AUTOMATA THEORY

Course Objective:

- Understand formal definitions of machine models.
- Classify machines by their power to recognize languages.
- Understanding of hierarchical organization of problems depending on their complexity
- Understanding of undecidable problems

Course Outcome:

At the end of the course, students will be able to

- Construct finite state diagrams while solving problems of computer science
- Construct Grammars for given Automata
- Find solutions to the problems using Turing machines
- Design of new grammar and language

UNIT- I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers. Finite Automata: NFA with e transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without e-transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Introduction to Finite Automata with output.

UNIT- II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets (proofs not required), closure properties of regular sets (proofs not required) Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, and sentential forms. Rightmost and leftmost derivation of strings.

UNIT-III

Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration properties of CFL (proofs omitted).Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT- IV

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required). Linear bounded automata and context sensitive language.

UNIT- V

Computability Theory: Chomsky hierarchy of languages, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility.

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J.D. Pearson Education.
2. Introduction to Theory of Computation —Sipser 2nd edition Thomson.

REFERENCE BOOKS:

1. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan Rama R.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. Theory Of Computation: A Problem-Solving Approach, Kavi Mahesh, Wiley India Pvt. Ltd.
4. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
5. Theory of Computer Science — Automata languages and computation-Mishra and Chandrashekaran, 2nd edition, PHI.

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PROFESSIONAL ELECTIVE – I
PRINCIPLES OF PROGRAMMING LANGUAGES

Course Objectives:

- To briefly describe various programming paradigms.
- To provide conceptual understanding of High level language design and implementation.
- To introduce the power of scripting languages.

Course Outcomes:

- Ability to apply suitable programming paradigm for the application.
- Ability to express syntax and semantics in formal notation.
- Apply Object Oriented, Concurrency programming constructs
- Gain knowledge on comparing the features of programming languages.

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT III:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co-routines.

UNIT IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Case Study: Python- Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A. B. Tucker, R. E. Noonan, TMH.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.
4. Programming in Prolog, W. F. Clocksin & C. S. Mellish, 5th Edition, Springer.

5. Programming Python, M. Lutz, 3rd Edition, O'reilly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michel Dawson, Thomson, 2008

PROFESSIONAL ELECTIVE – I
HUMAN COMPUTER INTERACTION

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Course Objectives:
The student should be made to:

- Learn the foundations of Human Computer Interaction.
- Be familiar with the design process.
- Learn about various models and theories.
- Be aware of mobile HCI.
- Learn the guidelines for web interface.

Course Outcomes:
Upon completion of the course, Students will be able to:

- Explain the capabilities of both humans and computers from the viewpoint of human information processing.
- Describe and use HCI design principles, standards and guidelines.
- Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
- Discuss about different mobile applications and related design issues.
- Analyze and discuss HCI issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I
FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning and problem solving; T**he computer-**Display Devices, Memory, processing and networks; **The Interaction-** Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface, Interactivity; **Paradigms**.

UNIT II
DESIGN PROCESS: Interaction Design basics – The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping.
HCI in software process – software life cycle, Usability engineering, Prototyping in practice, Design rationale.

Design rules – Principles to support usability, Standards, guidelines, Golden rules and heuristics. **Evaluation Techniques,** Universal **Design.**

UNIT III

MODELS AND THEORIES: Cognitive models, Socio-Organizational issues and stake holder requirements, Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks.

Types of Mobile Applications: Widgets, Applications, Games, Mobile Information Architecture.

Mobile Design: Elements of Mobile Design, Tools; **Mobile 2.0**.

UNIT V

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I, II & III).
2. Brian Fling, "Mobile Design and Development", First Edition, O'Reilly Media Inc., 2009 (UNIT–IV).
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009. (UNIT-V).

REFERENCE BOOKS

1. The essential guide to user interface design, Wilbert 0 Galitz, Wiley DreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
3. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

II Year B.Tech. CSE – I Sem

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PROFESSIONAL ELECTIVE – I
SOFTWARE PROJECT MANAGEMENT

Course Objectives

The objectives of the course can be characterized as follows.

- Understanding the specific roles within a software organization as related to project and process management
- Understanding the basic infrastructure competences (e.g., process modeling and measurement)
- Understand the principles, techniques, methods & tools for model-based management of software projects
- Understanding the basic steps of project planning, project management. Quality assurance, and process management and their relationships.

Course Outcomes

At the end of the course, the student shall be able to:

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
- Describe Artifacts of the process and process automation.
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II

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 III

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.

UNIT IV

Work Flows of the process: Software process workflows, Inter trans workflows.

Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction 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 V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Example: Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.

Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R).

TEXT BOOKS:

1. Software Project Management, Walker Royce, Pearson Education, 1998

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition,Tata Mc- Graw Hill, 2006.
2. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
3. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007 Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.

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OPERATING SYSTEMS & COMPUTER NETWORKS LAB THROUGH LINUX

Objectives:

- To understand the operating System functionalities.
- To understand the functionalities of various layers of OSI model

Part - A: Operating Systems

Week 1: Basic commands in Linux

(i) File handling utilities

a) cat b) mv c) rm d) cp

(ii) Directory commands

a) mkdir b) cd c) ls d) rmdir

Week2: Simulate the following CPU Scheduling Algorithms using C.

a) FCFS b) SJF

Week 3: Simulate the following CPU Scheduling Algorithms using C.

a) Priority b) Round Robin

Week 4: Simulate Paging Technique of Memory Management using C.

Week 5: Write a program to implement page replacement algorithms (FIFO, Optimal, and LRU).

Week 6: Write a C program to simulate the following file allocation strategies.

a) Sequential b) Indexed c) Linked

Week 7: Write a program to implement Banker's algorithm for deadlock avoidance.

Part - B: Computer Networks

Week 8: Design and Implement the data link layer farming methods such as character stuffing and bit stuffing.

Week 9: Implementation of Hamming code algorithm
Week 10: Implement CRC technique for any frame using generator polynomial.
Week 11: Implement Dijkstra's algorithm to compute the Shortest path through a graph.
Week 12: Take an example subnet graph with weights indicating delay between nodes. Construct Routing table art each node using Distance Vector Routing Algorithm.
Week 13: Analyze an example subnet of hosts. Construct and simulate broadcast tree for it.

Part – C

Syllabi of

B.Tech., III Year II Semester

III Year B.Tech. CSE – II Sem

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WEB TECHNOLOGIES

Course Objectives:

- To introduce students with programming languages and techniques associated with the World Wide Web for creating dynamic web pages
- To Introduce Web- based media rich Programming Tools for developing Server side applications

Course Outcomes:

- Create web pages using HTML and Cascading Style Sheets
- Have understanding of client side scripting language -java script to build dynamic web pages
- Have understanding of XML and how to parse XML data with java
- Have understating of server side programming with PHP , Servlets , JSP and JDBC

UNIT –I

Introduction to HTML: HTML tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets

Client Side Scripting: Java Script Language – Declaring variables, Scope of variables, Functions, Objects in java script , Dynamic HTML with java script, Form Validation.

UNIT –II

XML: Introduction to XML, Defining XML tags their attributes and values, Document Type Definition, XML Schema, Document Object Model, and XHTML.
Parsing XML Data: DOM and SAX Parsers in java.
AJAX A New approach: Introduction to Ajax, Simple Ajax Application

UNIT –III
Introduction to PHP:
Declaring variables, data types arrays, strings, operators, expressions, control structures, functions Reading data from web form controls like text boxes, radio buttons, lists etc. Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.
File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files listing directories.

UNIT –IV
Introduction to Servlets: Common Gateway Interface (CGI), The Servlet API, Life cycle of a Servlet, Deploying a Servlet, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions.
Introduction to JDBC: JDBC Drivers, JDBC Process, Connecting to a Database using JDBC.

UNIT –V
Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, Implicit Objects, Using Beans in JSP Pages, Using Cookies and Session for Session Tracking, Connecting to Database using JSP.
Introduction to MVC Architecture.

TEXT BOOKS
1. Programming the World Wide Web (7th Edition) 7th Edition by Robert W. Sebesta
2. Web Technologies Uttam K Roy, Oxford University Press
3. The Complete Reference PHP – **Steven Holzner** , Tata McGraw-Hill

REFERENCE BOOKS
1. Web Programming, Building Internet Applications , Chris Bates 2nd edition , Wiley Dreamtech
2. Java Script , D Flanagan, O'Reilly,SPD
3. Java Server Pages- Hans Bergsten , SPD O'Reilly

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III Year B.Tech. CSE – II Sem	**3**	**1**	**0**	**3**

COMPILER DESIGN

Course Objectives:

- To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.
- To learn how a compiler works and know about the powerful compiler generation tools and techniques, which are useful to the other non-compiler applications.
- To introduce the major concept areas of language translation and compiler design.
- To realize the computer science as the basis for real time applications

Course Outcomes:

- Able to differentiate the phases in compilation & parsing.
- Able to gain the knowledge in parsing and semantic analysis.
- Able to understand about symbol tables and code optimization methods.
- Able to analyze data flow and generate object code.

UNIT – I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass

and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – II

Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT – III

Semantic analysis: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Type checker.

Symbol Tables: Symbol table format, organization for block structures languages, hashing, and tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT – IV

Code optimization: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT – V

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

1. Principles of compiler design -A.V. Aho. J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C – Andrew N. Appel, Cambridge University Press.

REFERENCES:

1. Compiler Construction- An Advanced Course – Manish kumar Jha, Dhanpat Rai, Third completely Revised Version
2. Lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly

3. Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.

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III Year B.Tech. CSE – II Sem	**3**	**1**	**0**	**3**

DATA WAREHOUSING AND DATA MINING

Course Objectives:

- To understand the evolution of data warehousing and data mining systems
- Able to know how to preprocess the data.
- Understand Association and Classification Algorithms.
- To understand how data is grouped using clustering techniques.

Course Outcomes:

- Ability to understand the fundamentals of Data warehousing and OLAP technology.
- Ability to understand Data Mining and Data pre-processing.
- Analyze and apply association and classification algorithms on large data sets.
- Analyze and apply clustering techniques on large data.

UNIT - I

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data ware housing to data mining.

UNIT - II

Introduction to Data Mining: What motivated data mining? Why it is important? So-What is Data mining, Data Mining-On What Kind of Data, Data Mining Functionalities-What kind of patterns can be Mined, Are All of the patterns Interesting, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data warehouse system, Major issues in Data mining.

Data pre-processing:- Why Preprocess the Data, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT – III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods, Mining Various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV

Classification & Prediction: What is Classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back Propagation, Support Vector Machines, Associative Classification: Classification by Association Rule Analysis, Lazy Learners, Other Classification Methods, Prediction.

UNIT - V

Cluster Analysis: What is Cluster Analysis, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

Text Book:

1. Data Mining- Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei –Morgan Kaufmann publishers – 2nd edition

2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education

References:

1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley student Edition

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III Year B.Tech. CSE – II Sem

PROFESSIONAL ELECTIVE - II
OBJECT ORIENTED ANALYSIS AND DESIGN

Course Objectives:

- To learn the concept of Object Oriented Software Development Process
- To get acquainted with UML Diagrams
- To understand Object Oriented Analysis Processes

Course Outcomes:

- Understand Object Oriented Software Development Process
- Gain exposure to Object Oriented Methodologies & UML Diagrams
- To apply Object Oriented Analysis Processes for projects
- Apply Unified Modeling Language Construct for Developing Structural Design of a given Project.

UNIT– I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture and Software Development Life Cycle.

UNIT– II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Packages.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT– III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT– IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT– V

Case Study: The Unified library application, ATM System.

TEXT BOOKS

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS

1. Analysis and Design and Unified Process, Craig Larman, Pearson Education.
2. Object Oriented Analysis, Design and Implementation, B.Dathan. S.Ramnath, Universities Press.
3. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

III Year B.Tech. CSE – II Sem

PROFESSIONAL ELECTIVE - II **DISTRIBUTED SYSTEMS**	**L**	**T**	**P**	**C**
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Course Outcomes:

- Able to understand the characteristics of Distributed Systems and Global States.
- Able to differentiate the types of Interprocess communication.
- Able to Understand DNS and Able to implement file service Architecture.
- Able to Analyze the Distributed Transaction Management

Course Objective:

- To understand what and why distributed system is
- To understand theoretical concepts, namely, virtual time and agreement

- To understand IPC, Group communication and RPC concepts
- To understand the concepts of transaction in distributed environment

UNIT-I

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models, Fundamental Models.

UNIT-II

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging, Distributed Mutual Exclusion.

UNIT-III

Interprocess Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV

Distributed File Systems: Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

UNIT- V

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control.

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols.

TEXT BOOK

- Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 4th Edition 2009.

REFERENCE BOOKS

- Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
- Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC, Taylor & Fransis Group, 2007.

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III Year B.Tech. CSE – II Sem	**3**	**1**	**0**	**3**

PROFESSIONAL ELECTIVE - II

INFORMATION RETRIEVAL SYSTEMS

Course Objectives:

- Study fundamentals of DBMS, Data warehouse and Digital libraries
- Learn various preprocessing techniques and searching and indexing approaches in text mining
- Know various clustering approaches and study different similarity measures and different cognitive approaches used in text retrieval systems
- Know about query languages and online IR system

Course Outcomes

By the end of this course the student should be able to:

- Recognize the Boolean Model, Vector Space Model, and Probabilistic Model.
- Understand retrieval utilities and different formatting tags
- Understand cross-language information retrieval
- Understand the clustering techniques and determine the efficiency.

UNIT-I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT-II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-III

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

TEXTBOOK:

1.Kowalski, Gerald, Mark T Maybury: Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.

REFERENCES:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Modern Information Retrival by Yates Pearson Education.
3. Information Storage & Retieval by Robert Korfhage – John Wiley & Sons.

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III Year B.Tech. CSE – II Sem

WEB TECHNOLOGIES & CASE TOOLS LAB

Part – A: Web Technologies

Objectives:

To enable the students to program web applications using the following technologies: HTML, JavaScript, AJAX, PHP, Tomcat server, Servlets and JSP.

Week1:

a) Write an HTML page including any required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in another text field words. If number is out of range ,it should show "out of range"

and if it is not a number, it should show "not a number "message in the result box.

b) Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters ,words and lines in the text entered using an alert message. words are separated with white spaces and lines are separated with new line character.

Week 2:

Write an HTML page that contains a selection box with a list of 5 countries .when the user selects a country; its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital color, bold and font size

Week 3:

Create an XML document that contains 10 users information, write a java program which takes user id as input and returns the user details by taking the user information from the XML document using (a) DOM parser (b) SAX parser

Week 4:

Implement the following web application using PHP

i. A user validation web application, where the user submits the login name and password to the server. The name and password are checked against the data already available in database and if the data matches a successful login page is returned otherwise a failure message is shown to the user.

ii. Modify above program to use an xml file instead of database.

iii. Modify the above program to use AJAX to show the result on the same page below submit button.

iv. A sample calculator web application that takes two numbers and an operator(+,-,*,/,%) from an HTML page and returns the result page with the operation performed on the operands.

v. Modify the above program such that it stores each query in the database and checks the database first for the result. If the query is already available in the Debit returns the value that was previously computed (from DB) or it computes the result and returns it after storing the new query and result in DB.

vi. A web application takes a name as input and on submit it shows a hello <name>page where <name> is taken from the request ,it shows the start time at right top corner of the page and provide logout button. On clicking button, it should show a logout page with thank you <name> message with the duration of usage (HINT: use session to store name and time)

vii. A web application that takes name and age from the HTML page. if the age is less than 18,it should send a page with "Hello<name>,you are not authorized to visit this site" message ,where <name>,should be replaced with the entered name. otherwise it should send "welcome <name> to this site" message.

viii. A web application for implementation:
The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from the data base and takes the following decisions;

If name and password matches ,serves a welcome page with user's full name If name matches and password doesn't match ,then serves 'password mismatch' page If name is not found in the database, serves a registration page ,where user's full name is asked and on submitting the full name ,it stores ,the login name, password and full name in the database(HINT: use session for storing the submitted login name and password).

ix. A web application that lists all cookies stored in the browser on clicking "list cookies "button. Add cookies if necessary.

Week 5:

Implement the week 4 web applications using servlets

Week 6:

Implement the Week 4 web application using JSP

Part – B: Case Tools lab

Objectives:

- Understand how UML supports the entire OOAD process
- Become familiar with all phases of OOAD.
- Understand different software testing tools and their features.

1. Student are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM systems whose description is given below:
   UML diagrams to be developed are
   1. Use case diagram
   2. Class diagram
   3. Sequence diagram
   4. Collaboration diagram
   5. State diagram
   6. Activity diagram
   7. Component diagram
   8. Deployment diagram

Description of an ATM system

The software to be designed will control a simulated Automated Teller Machine (ATM) having magnetic stripe reader for reading an ATM card, a customer console (Keyboard and Display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash(in multiples of Rs 100, Rs 500 and Rs 1000) a printer for printing customer receipts and Key operated switch to allow an operator to start or stop the machine. The ATM will communicate with the banks over an

appropriate a communication link (the software on the latter is not part of the requirements for this problem).

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned – except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs 100, Rs 500 and Rs 1000. Approval must be obtained from the bank before the cash is dispensed.
2. A customer must be able to make the deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance enquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit a second message will be sent to the bank indicating that the customer has deposited the envelope(if the customer fails to deposit the envelop within the timeout period, or pressed cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer).

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. The customer is unable to successfully enter the PIN after three trails, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction.

The ATM will have a key operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the ON position the operator will be required to verify and enter the total cash on hand. The machine can only be turned OFF when it is not servicing a customer. When the switch is moved to OFF position, the machine will shut down so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts etc.

COMPILER DESIGN & DATA MINING LAB

Part - A: Compiler Design

Course Objectives:

- To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar.

Course Outcomes:

- Able to understand the practical approach of how a compiler works.
- Enables the knowledge to work in the development phase of new computer languages in industry.

<program> ::= <block>
<block> ::= { <variabledefinition> <slist> } | { <slist> }
<variabledefinition> ::= int<vardeflist>;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [<constant>]
<slist> ::= <statement> | <statement>; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block> | <printstatement> | <empty>
<assignment> ::= <identifier> = <expression> | <identifier> [<expression>] = <expression>
<ifstatement> ::= <bexpression> then <slist> else <slist> endif | if <bexpression> then <slist> endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> ::= print (<expression>)
<expression> ::= <expression> <additionop> <term> | <term> | addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | == | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <mulitop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [<expression>] | (<expression>)
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= <letter> | <digit>
<letter> ::= a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z
<digit> ::= 0|1|2|3|4|5|6|7|8|9
<empty> has the obvious meaning

Comments (zero or more characters enclosed between the standard C / Java style comment brackets /*...*/) can be inserted.

A simple program written in this language is:

```
{
  int a[3], t1, t2;
  t1 = 2;
  a[0] = 1; a[1] = 2; a[t1] = 3;
  t2 = -(a[2] + t1 * 6)/ a[2] - t1);
  if t2 > 5 then
  print(t2);
  else
  {
    int t3;
    t3 = 99;
    t2 = -25;
    print(-t1 + t2 * t3); /* this is a comment on 2 lines */
  }
  end if
}
```

Week 1: Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.

Week 2: Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.

Week 3: Design Recursive decent parser for the given language.

Week 4: Design LALR bottom up parser for the given language.

Week 5: Convert the BNF rules into YACC from and write code to generate abstract syntax tree.

Week 6: Design a Machine code for the Given Intermediate code.

The instruction set is defined as follows:

MOV A, R

moves the integer value specified by A into register R.

ADD A, R

adds the value specified by A to register R, leaving the result in register R.

SUB A, R

subtracts the value specified by A from register R, leaving the result in register R. MUL A, R

multiplies the value specified by A by register R, leaving the result in register R.

DIV A, R

divides register R by the value specified by A, leaving the result in register R.

NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a STOP instruction.

Part - B: Data Mining

Course Objectives:

- To attain knowledge in fundamentals of data miming, warehousing and data reprocessing techniques.
- To describe the basic principles and algorithms used in practical data mining and understand their strengths and weaknesses.
- To apply data mining techniques to solve problems in other disciplines in a mathematical way.
- To apply data mining methodologies and identify different trends in data mining.

Course Outcomes:

- Ability to add mining algorithms as a component to the existing tools.
- Able to apply mining techniques for realistic data.

Week-1: Analyze a sample dataset using classification technique in WEKA Tool.
Week-2: Demonstrate Apriori based Association Rule Mining.
Week-3: Demonstrate FP –growth based Association Rule Mining.
Week-4: Demonstrate K-means Clustering Algorithm.
Week-5: Demonstrate PAM based Clustering.
Week-6: Analyze German Credit Data Assessment using various Data mining Techniques.

Part – D

OPEN ELECTIVES

&

GENERAL SUBJECTS

OPEN ELECTIVES

Introduction

The B.Tech course structure under CBCS consists of 4 Professional Electives and 3 open electives. Each professional elective offered by the students own department gives a choice of three to four courses out of which the student is to select one course. Similarly under open elective system, the student is offered one course each in 3 semesters viz., 3/1, 3/2 & 4/1 with 3 credits.

The six engg. and along with MBA depts. of the college have been divided into four groups
Group- I - ECE & EEE
Group –II - CSE & IT
Group –III - Mechanical & Civil
Group –IV- MBA
Under CBCS, a student from a particular group cannot opt the courses offered by that particular group.

Details of the Courses offered by different Groups -1
Courses offered by Group -1 Departments

ECE
III Year – I Semester
1. Introduction to Microcontrollers & Applications
2. Basic Electronics & Instrumentation
III Year – II Semester
1. Fundamentals of Embedded Systems
2. Principles of Communications

EEE
III Year – I Semester
1. Non Conventional Energy Sources
2. Energy Management
III Year – II Semester
1. Principles of Electrical Power Utilization

2. Energy Auditing &Conservation

Courses offered by Group-2 Departments

CSE/IT

III Year – I Semester

1. Java Programming
2. Operating Systems

III Year – II Semester

1. Database Management Systems
2. Software Engineering

Courses offered by Group-3 Departments

MECH

I Semester

1. Elements of Mechanical Engineering
2. Industrial Engineering

II Semester

1. Basic Automobile Engineering
2. Material Science and Engineering

CIVIL

I Semester

1. Remote Sensing and GIS
2. Smart City

II Semester

1. Green Building
2. Environmental Pollution and Control Methods

Courses offered by Group-4 Department

MBA

I Semester

Total engineering Quality Management

II Semester

Basics of Banking and Capital Market

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MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

PRE REQUISITES:

- Probability and statistics
- Operation research
- Mathematics-I
- Environmental studies

Course Objectives: To enable the student to understand, with a practical insight,

- The importance of certain basic issues governing the business operations namely demand and supply, production function, cost analysis,
- analysis of markets, forms of business organizations,
- Significance of capital budgeting and financial accounting and financial analysis.

UNIT –I:
Introduction to Managerial Economics& Demand Analysis:

Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT –II:
Production & Cost Analysis:

Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts (Opportunity cost vs outlay costs, Fixed, variable and semi variable costs, marginal cost vs average cost, out of pocket vs book cost, imputed cost, implicit & explicit cost, incremental and decremental cost, sunk vs future cost, separable and joint costs) Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT –III:
Markets & New Economic Environment:

Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing.

Business: Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario.

UNIT-IV: Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and Conventions Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).Financial Analysis: Analysis and Interpretation of Liquidity Ratios (current ratio, quick ratio), Activity Ratios(inventory turnover ratio, debtors turnover ratio), and Capital structure Ratios(debt equity ratio, interest coverage ratio) and Profitability ratios(gross profit ratio, net profit ratio, operating profit ratio, P/E ratio, EPS). Du Pont Chart.

UNIT –V: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital, Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method (simple problems), IRR and PI method.

Outcomes: At the end of the course the students is expected

- To understand and enhance the knowledge regarding managerial economics concepts and obtaining optimal solutions.
- To get an idea of analysis of firm's financial position with the techniques of financial analysis and ratio analysis.

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
2. Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage 2011.
3. J.V.Prabhakar Rao & P.V.Rao, Managerial Economics & Financial Analysis, Maruthi Publishers, 2011.

REFERENCE BOOKS:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
3. Lipsey & Chrystel, Economics, Oxford University Press, 2012
4. Domnick Salvatore: Managerial Economics in a Global Economy, Thomson, 2012.
5. Narayanaswamy: Financial Accounting—A Managerial Perspective, Pearson, 2012.
6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2012.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.

8. Dwivedi: Managerial Economics, Vikas, 2012.
9. Kasi Reddy, Saraswathi, MEFA, PHI Learning, 2012.
10. Shailaja & Usha : MEFA, University Press, 2012.

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ADVANCED COMMUNICATION SKILLS (ACS) LAB
(Common to all branches)

The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.
The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.

Objectives:
This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educational English speakers and respond appropriately in different socio-cultural and professional contexts.

Syllabus:

The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) lab:

1. **Activities on Fundamentals of inter-personal Communication and Building Vocabulary –** Starting a conversation – responding appropriately and relevantly – using the right body language - Role Play in different situations & Discourse Skills – using visuals – Synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. **Activities on Reading Comprehension** – General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.

3. **Activities on Writing Skills –** Structure and presentation of different types of writing – letter writing/ Resume writing/ e-correspondence/ Technical report writing / Portfolio writing – planning for writing – improving one's writing.
4. **Activities on Presentation Skills –** Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/e-mails/assignments etc.
5. **Activities on Group Discussion and interview Skills –** Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation. Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video – conference and Mock Interviews.

Books Recommended:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D. Pearson Education 2011.
3. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
4. Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.
5. The Basics of Communication: A Relational Perspective. Steve Duck & David T. Mc Mahan. Sage South Asia Edition. Sage Publications. 2012.
6. English Vocabulary in Use series, Cambridge University Press. 2009
7. Management Shapers Series by Universities Press (India) Pvt. Ltd. Himayatnagar, Hyderabad. 2008.
8. Handbook for Technical Communication by David A. McMurrey & Joanna Buckley. 2012. Cengage Learning.
9. Communication Skills by Leena Sen.PHI Learning Pvt. Ltd. New Delhi. 2009.
10. Handbook for Technical Writing by David A McMurrey & Joanna Buckley Cengage Learning. 2008.
11. Job Hunting by Colm Downess, Cambridge University Press 2008.
12. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
13. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hill. 2009.
14. Books on TOEFL/GRE/GMAT/ICAT/IELTS by Barron's/DELTA/Cambridge University Press.
15. International English for Call Centres by Barry Tomalin and Suhashini Thomas Macmillan Publishers. 2009.

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PERSONALITY DEVELOPMENT AND BEHAVIOURAL SKILLS

Course Objectives

- To enable students to communicate with outside and peer group members in an effective manner.
- To enable the students to give better presentation and explanation on their projects, posters and assignments - this makes them industry ready.
- To perform better during Campus Recruitment and various interviews they face in their career.

Course Outcomes

At the end of the course a student is expected:

- To communicate with more confidence using better spoken and written English
- To give better presentation and explanation with the use of digital inventions
- To perform well during Campus Drives and different Interviews

Course Outcomes

Unit – I

Personality Development: Definition - Various Aspects of Personality Development - Behavioural Traits. Importance of Soft skills-Soft skills for a future Entrepreneur - Qualities of a good leader - Stress Management - Success stories.

Unit – II

Non Verbal Communication: Kinesics Haptics Proxemics Vocalics Oculesics Body Language in Interviews.

Unit - III

Team Dynamics: Different Types of Teams-role of an individual - Communicating as a group or team leader - Individual Presentations/Team Presentation. Case Studies: Project Presentations.

UNIT-IV

Technical Report Writing: Formats - Effective Resume Preparation - Covering Letter - Statement of Purpose (SoP).

UNIT-V

Role of Multimedia in Communication: Communication in a Digital Edge (Video Conference Etc.)

E-Correspondence: Recent Trends in Professional Communication - Social Networking: Importance, Effects.

Blogging: Creating of Blogs - Technical and Non – technical blogs – Success Stories and Case Studies.

Reference Books

1. Barun, K Mitra, Personality Development and Soft Skills, Oxford University Press, 2nd Edition, 2016.
2. Gopalaswamy Ramesh, the Ace of Soft Skills: Attitude, Communication and Etiquette for Success, Pearson Education, 2013.
3. Krishna Mohan & Meera Banerji, Developing Communication Skills, Macmillan India Ltd, 2008.
4. Krishna Mohan & Meenakshi Raman, Effective English Communication, Tata McGraw-Hill Publishing Company Ltd, 2008.
5. Arati Gurav, 50 Mantra's of Personality Development, Buzzingstock Publishing House, 2013.
6. P. Kiranmai Dutt & Geetha Rajeevan, Basic Communication Skills, Cambridge University Pvt. Ltd2007.
7. S.C. Sood, Mita Bose, Naresh Jain, Developing Language Skills, Manohar Publications, 2007, T.M. Farhathullah, Communication Skills for Technical Students, Orient Longman Pvt Ltd, 2002.

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QUANTITATIVE METHODS & LOGICAL REASONING

Course Objectives:

1. The objective of this course is to enhance the problem solving skills in the areas of **'Quantitative Aptitude'** and **'Reasoning'** which will enable the students to better preparation for **Campus Placements** and competitive examinations.
2. To improve the logical thinking and mathematical ability of the students.

Course Outcomes:

At the end of the completion of the course a student is expected

1. To solve basic and complex mathematical problems in short time.
2. To perform well in various competitive exams and placement drives.

Quantitative Aptitude and Reasoning:

Unit – I

1. Number System:

Speed math's, Numbers, Factors, prime & Co primes, LCM & HCF, Divisibility rules, finding unit place digit and last two digits of an expression

2. Simple Equations:

Definition of Linear equation, word problems

3. Ratio, Proportion and Variations:

Definition of ratio, ratio of Proportion, Comparison of ratios, Compound ratio, Direct and indirect proportion

4. Percentages:

Converting fractions and decimal into percentages, successive percentage, populations, expenditure and savings

5. Profit and loss:

Relation between Cost price and selling price, Discount and Marked price, Gain or Loss percentages on selling price

6. Simple and Compound Interest:

Problems on interest (**I**), amount (**A**), Principal (**P**) and rate of interest(**R**)
Difference between the simple interest and compound interest for 2 and 3 years.

Unit-II

1. Partnership:

Relation between partners, period of investment and shares

2. Averages and Ages:

Average of different groups, change in averages by Adding, deleting and Replacement of objects, problems on ages.

3. Allegation and mixtures:

Allegation rule, Mean value of the mixture, Replacement of equal amount of quantity.

Time and Work:

Men and Days, Work and Wages, pipes and cisterns, hours and work, Alternate day's concept,

Time and Distance:

Difference between the average and Relative speeds, reaching the destination late and early, Stoppage time per hour, time and distance between two moving bodies

Trains, Boats and Streams:

Train crossing man, same and opposite directions, Speed of boat and stream,

Unit-III

1. Progressions:

Arithmetic, Geometric and Harmonic Progressions, Arithmetic Mean, Geometric Mean and Harmonic Mean and their relations.

2. Quadratic Equations:

General form of Quadratic equation, finding the roots of Quadratic equation, Nature of the Roots.

3. Mensurations:

2D geometry- perimeter, areas, 3D geometry - surface areas, volumes

4. Permutation and Combination:

Fundamental rules, problems on permutations & combinations.

5. Probability

Definition of probability, notations and formulae, problems on probability.

6. Data Interpretation and Data Sufficiency:

Tabular and Pie-charts, Bar and Line graphs, Introduction to data sufficiency, problems on data sufficiency.

Unit-IV

1. Deductions:

Statements and conclusions using Venn diagram and Syllogism method

2. Connectives:
Definition of simple and compound statements, Implications and negations for compound statements.

3. Series completion:
Number series, Alphabet series, letter series.

4. Coding and Decoding:
Letter coding, Number coding, Number to letter coding, Matrix coding, Substitution, Mixed letter coding, Mixed number coding, Deciphering individual letter codes by analysis.

5. Analytical Reasoning Puzzles:
Problems on Linear, Double line-up and Circular arrangements, Selections and Comparisons.

6. Blood Relations:
Defining the various relations among the members of a family, Solving Blood Relation Puzzles by using symbols and notations. Problems on Coded relations.

Unit-V

1. Direction sense test:
Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.

2. Clocks:
Relation between minute-hour hands, angle vs time, exceptional cases in clocks

3. Calendars:
Definition of a Leap Year, Finding the Odd days, Finding the day of any random calendar date, repetition of calendar years.

4. Cubes and Dices:
Finding the minimum and maximum number of identical pieces and cuts, painting of cubes and cuts, problems on dice.

5. Venn diagrams:
Circular representation of given words, Geometrical representation of certain class, set theory based problems.

6. Number, Ranking and Time sequence test:
Number test, Ranking test, Time sequence test.

Text Books:

1. GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Material
2. R S Agarwal, S.chand, 'A modern approach to logical reasoning'
3. R S Agarwal, S.Chand, 'Quantitative Aptitude'

Reference Books:

1. Quantitative Aptitude-G.L BARRONS
2. Quantitative Aptitude-Abhijit Guha Mc Graw Hills.
3. Quantitative Aptitude-U.Mohan Rao SCITECH.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

An Autonomous Institution

Aziznagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

ACADEMIC REGULATIONS & SYLLABI (R15)

for

B.Tech (CSE) Fourth Year

(Applicable for the batches admitted from the Academic Year 2018-2019 onwards)

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Course Structure & Syllabi

of

B.Tech. IV Year I Semester

A

B.TECH CSE IV YEAR COURSE STRUCTURE

S. No.	Subject Code	Subject Name	L	T	P	Total Credits
B.Tech IV YEAR I SEMESTER						
1	**A17531**	Mobile Application Development	3	1	0	3
2	**A17532**	Information Security	3	1	0	3
3	**A17533**	Cloud Computing	3	1	0	3
4	**A17535** **A17537** **A17536**	**Professional Electives-3** 1.Big Data Analysis 2. Internet Of Things 3. Image Processing	3	1	0	3
5	**A17538** **A17540** **A17534**	**Professional Electives-4** 1.Advanced Databases 2.Computer Graphics 3.Software Testing Methodologies	3	1	0	3
6	**A17541** **A17542**	**Open Electives-3** 1. Information System For Engineers 2.Web Design	3	1	0	3
7	**A17593**	Mobile Application Development Lab	0	0	3	2
8	**Professional Elective Lab**	***A17594:*** Hadoop & Bigdata Lab ***A17595:*** Internet of Things Lab ***A17596:*** Image Processing With SCI Lab	0	0	3	2
9	**MP-1**	Mini Project	0	0	0	2
		Total Credits				**24**
B.Tech IV YEAR II SEMESTER						
1	**A18543**	Design Patterns	3	1	0	3
2	**A18545**	Machine Learning	3	1	0	3
3	**A18546**	Semantic and Social Networks	3	1	0	3
4	**TS**	Technical Seminar	0	0	6	2
5	**CVV**	Comprehensive Viva-Voce	0	0	0	2
6	**MP-II**	Project	**0**	**0**	**15**	11
		Total Credits				**24**

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

MOBILE APPLICATION DEVELOPMENT

Course Outcomes: At the end of this course, the student would be able to:

1. Understand the concepts of J2ME.
2. Design a User Interface for a mobile application using J2ME.
3. Create a mobile application for small computing devices.
4. Apply the concepts of JDBC & Embedded SQL for database connection
5. Understand the generic connection framework.

UNIT-I

Small Computing Technology:

Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistance, Mobile Power, Set-Top Boxes, Smart Cards

UNIT-II

J2ME Overview

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices.

J2ME Architecture and Development Environment

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

J2ME Best Practices and Patterns

The Reality of Working in a J2ME World, Best Practices.

UNIT-III

Commands, Items, and Event Processing

J2ME User Interfaces, Display Class, the Palm OS Emulator, Command Class, Item Class, Exception Handling.

High-Level Display Screens

Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

Low-Level Display Canvas

The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT-IV

Record Management System

Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

JDBC Objects

The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, Statement Objects, Result set, Exceptions, Model Programs.

JDBC and Embedded SQL

Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs.

UNIT-V

Generic Connection Framework

The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process.

TEXT BOOKS

1. J2ME: The Complete Reference, James Keogh, Tata McGraw-Hill.
2. Programming for Mobile and Remote Computers, G.T.Thampi, drearntec press.

REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications — Michael Juntao Yuan, Pearson Education, 2004.
2. Beginning Java ME Platform, Ray Rischpater, 2009.
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, 2005.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

INFORMATION SECURITY

Course Outcomes: At the end of this course, the student would be able to:

1. Identify various Security Attacks.
2. Understand various Encryption Principles and algorithms.
3. Analyze different Cryptography algorithms.
4. Understand various Security Associations and Key Management.
5. Design a Firewall for Security.

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT-II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT-III

Public key cryptography principles; public key cryptography algorithms; digital signatures, digital Certificates; Certificate Authority and key management Kerberos, X.509; Directory Authentication Service; Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT-IV

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.
Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS),
Secure Electronic Transaction (SET).

UNIT-V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, Wiley Dreamtech.

REFERENCES

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH.
6. Introduction to Cryptography, Buchmann, Springer.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

CLOUD COMPUTING

Course Outcomes: At the end of this course, the student would be able to:

1. Understand different Cloud Service
2. Analyze different approaches for migration in to Cloud
3. Prioritize the challenges in Cloud Technology
4. Understand the virtualization concepts
5. Assess future research directions in Cloud Computing

UNIT -I

Introduction to Cloud Computing

Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenge and Risks.

UNIT-II

Migration into a Cloud

Introduction, Broad Approaches to Migrating into the Cloud, the Seven-Step Model of Migration into a Cloud.

Enriching the 'Integration as a Service' Paradigm for the Cloud Era

An Introduction, The Onset of Knowledge Era, The Evolution of SaaS, The challenges of SaaS Paradigm, Approaching the SaaS integration enigma, New integration scenarios, The integration Methodologies, Saas integration products and platforms, SaaS Integration Services, Business to Business Integration (B2Bi) Services.

UNIT-III

The Enterprise Cloud Computing Paradigm

Introduction, Background, Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers toward a Marketplace for Enterprise Cloud Computing, The Cloud Supply Chain.

UNIT-IV

Virtual Machines Provisioning and Migration Services

Introduction and Inspiration, Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Future Research Directions.

Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing Open Questions and Challenges.

UNIT-V

Data Security in the Cloud

An Introduction to the idea of Data Security, The Current State of Data Security in the Cloud, Homo Sapiens and Digital Information, Cloud Computing and Data Security Risk, Cloud Computing and Identity, Digital Identity and Data Security, Content Level Security— Pros and Cons.

TEXT BOOKS

1. Rajkumar Buyya, James Broberg, AndrZej Goscinski, Cloud Computing Principles and Paradigms, Wiley Publications.

REFERENCE BOOKS

1 Michael Miller, Cloud Computing – Web-Based Application That Change the Way You Work and Collaborate Online, Pearson Publications.

2 Thomas Erl, Zaigham Mahmood, & Ricardo Puttini, Cloud Computing- Concepts, Technology & Architecture Pearson Publications.

3 Kai Hwang, Geoffrey C.Fox. Jack J. Dongarra, Distributed and Cloud Computing – From Parallel Processing to the Internet of Things, ELSEVIER Publications.

IV YEAR B.Tech. CSE -I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–3: BIG DATA ANALYTICS

Course Outcomes: At the end of the course, the student should be able to:

1. Explain the foundations, definitions, and challenges of Big Data.
2. Use Hadoop file system interfaces.
3. Program using HADOOP and Map reduce, NOSQL.
4. Understand various Hadoop Eco Systems.
5. Prepare the data for Visualization.

UNIT-I

Introduction To Big Data and Hadoop

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analyzing Data with Unix tools, Analyzing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Info sphere Big Insights and Big Sheets

UNIT-II

HDFS (Hadoop Distributed File System)

The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT-III

Map Reduce

Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

UNIT-IV

Hadoop Eco System

Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

Hbase: HBasics, Concepts, Clients, Example, Hbase versus RDBMS.

Big SQL: Introduction.

UNIT-V

Data Visualization

Prepare the data for Visualization, Use tools like Tableau, Qlick View and data insights out of visualization tool; Product implementation.

TEXT BOOKS

1 Tom White Hadoop: The Definitive Guide" Third Edit on, O'reily Media, 2012.

REFERENCE BOOKS

1 Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015. References
2 Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
3 Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)
4 Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.
5 Anand Rajaraman and Jef rey David Ulman, "Mining of Massive Datasets", Cambridge University Press, 2012.
6 Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
7 Glen J. Myat, "Making Sense of Data", John Wiley & Sons, 2007
8 Pete Warden, "Big Data Glossary", O'Reily, 2011.
9 Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–3: IMAGE PROCESSING

Course Outcomes (COs): After completion of the course, student would be able to:

1. Understand Digital image fundamentals,
2. Program Image Transformations,
3. Design Colour Image Processing and Restoration,
4. Implement Image segmentation techniques and
5. Program Image Compression techniques.

UNIT-I

Digital image fundamentals - Digital Image through scanner, digital camera. Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry.

UNIT-II

Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform. Image enhancement Point processing. Histogram processing. Spatial filtering.

UNIT-III

Enhancement in frequency domain, Image smoothing, Image sharpening. Colour image processing: Pseudo colour image processing, full colour image processing.
Image Restoration Degradation model, Algebraic approach to restoration, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT-IV

Image segmentation Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

UNIT-V

Image compression Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

TEXT BOOKS

1 Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education.

REFERENCES

1 Image Processing with Scilab and Image Processing Design Toolbox; Dr. Eng. (J) Harald Galda, 2011.
2 Fundamentals of Digital Image processing – A.K.Jain , PHI.
3 Digital Image processing using MAT LAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
4 Digital Image Processing – William K. Pratt, John Wilely, 3rd Edition, 2004.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–3: INTERNET OF THINGS (IoT)

Course Outcomes: After completion of the course, student would be able to:

1. Describe various IoT enabled technologies.
2. Understand the concepts of M2M with necessary protocols.
3. Illustrate Python programming for IoT
4. Examine the Python programming with Raspberry PI
5. Design web applications for IoT

UNIT-I

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT– IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT-II

Iot and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER.

UNIT-III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT-IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, and reading input from pins.

UNIT-V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API.

TEXT BOOK(S)

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–4: ADVANCED DATABASES

Course Outcomes: At the end of this course, the student would be able to:

1. Understand the concepts of Distributed Database Systems.
2. Identify different Architectural Models for Distributed DBMS.
3. Characterize the query processors.
4. Design Algorithms for Concurrency control Mechanisms.
5. Decide different Parallel DBMS Techniques based on given constraints.

UNIT-I

Introduction

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Overview of Relational DBMS: Relational Database Concepts, Normalization, Integrity rules, Relational data languages.

UNIT-II

Distributed DBMS Architecture

Architectural Models for Distributed DBMS, DDMBS Architecture.

Distributed Database Design

Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT-III

Query Processing and Decomposition

Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

Distributed Query Optimization

Query optimization, centralized query optimization, Distributed query optimization algorithms.

UNIT–IV

Transaction Management

Definition, properties of transaction; types of transactions.

Distributed Concurrency Control

Serializability, Concurrency control Mechanisms & Algorithms; Time stamped & Optimistic concurrency control algorithms, Deadlock Management.

UNIT-V

Distributed DBMS Reliability

Reliability concepts and Measures; fault-tolerance in Distributed systems, failures in Distributed DBMS, local & Distributed Reliability Protocols, site failures and Network partitioning.

Parallel Database Systems

Database Series, Parallel Architecture, Parallel DBMS Techniques, Parallel exception problems, Parallel Execution for Hierarchical architecture.

TEXT BOOK

1 Distributed Databases Stefano Ceri and Willipse Pelagatti:, McGraw Hill.

REFERENCE BOOKS

1 M.Tamer OZSU and Pauck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.

2 Henry F Korth, A Silberchatz and Sudershan : Database System Concepts. Tata MGH.

3 Raghurama krishnan and Johhanes Gehrke: Database Management Systems, MGH.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–4: COMPUTER GRAPHICS

Course Outcomes: At the end of this course, the student would be able to

1. Understand the areas of Computer Graphics.
2. Analyze 2 – D Geometrical transforms.
3. Analyze 3 – D Geometrical transforms.
4. Apply different visible surface detection methods.
5. Design of animation sequence.

UNIT-I

Introduction

Application areas of Computer Graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

Output Primitives

Points and lines, tine drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II

2 – D Geometrical Transformations

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems.

2-D Viewing

The viewing piplino, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen- Sutherland and Cyrus-beck line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT-III

3- D Object Representation

Polygon surfaces, quadric surfaces. spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.

3- D Geometric transformations

Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and Clipping.

UNIT-IV

Visible Surface Detection Methods

Classification, back face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, and area sub division and octree methods.

Illumination Models and Surface Rendering Methods
Basic illumination models, polygon rendering method.

UNIT-V
Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame system, Motion specification.

TEXT BOOK
1 "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.

REFERENCE BOOKS
1 Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
2 "Computer Graphics Second edition", Zhigand xiang. Roy Plastock, Schaum's outlines. rats Mc Graw 19 edition.
3 Procedural elements lot Computer Graphics, David F Rogers. Tata Mc Graw hill, 2nd edition.
4 Principles of interactive Computer Graphics. Neuman and Sprout TMH.
5 Principles of Computer Graphics. Shalni, Govil-Pal, Springer.
6 Computer Graphics F.S.H. S.M.Kelley. PHI.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
3	1	0	3

PROFESSIONAL ELECTIVE–4: SOFTWARE TESTING METHODOLOGIES

Course Outcomes: At the end of this course, the student would be able to

1. Understand the purpose of Software testing.
2. Outline various transaction flow testing techniques.
3. Understand domain testing.
4. Construct decision tables for Logic Based Testing.
5. Implement node reduction algorithm.

UNIT-I

Introduction

Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Flow graphs and Path testing basic concepts, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II

Transaction Flow Testing

Transaction flows, transaction flow testing techniques.

Dataflow testing

Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-III

Domain Testing

Domains and paths, Nice & ugly domains, domain testing. Domains and interfaces testing, domain and interface testing, domains and test ability.

UNIT-IV

Paths, Path products and Regular Expressions

Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing overview, decision tables, path expressions, KV charts, specifications.

UNIT-V

State, State Graphs and Transition Testing

State graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

TEXT BOOK

1 Software Testing techniques — Boris Beizer, Dreamtech, second edition.

REFERENCE BOOKS

1 Software Testing Tools — Dr.K.V.K.K.Prasad, Dreamtech.
2 The craft of software testing – Brian Marick, Pearson Education.
3 Software Testing, 3rd edition,P.C. Jorgen sen, Aurbach publications (Dist.by SPD).
4 Software Testing, N.Chauhan, Oxford University press.
5 Introduction to Software Testing, P.Amman n & J offutt, cambridge Univ.Press.
6 Effective methods of Software Testing, perry, John Wiley, 2nd Edition, 1999.
7 Software Testing Concepts and Tools, P.Nageswara rao dreamtech Press.
8 Software Testing, M.G.Limaye, TMH.
9 Software Testing, S.Desikan, G.Ramesh, Pearson.
10 Foundations of Software Testing, D.Graham & other, cengage Learning
11 Foundations of Software Testing, A.P.Mathur, Pearson.

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
0	0	3	2

HADOOP & BIGDATA LAB

Week 1, 2:

1. Implement the following Data structures in Java
   a) Linked Lists b) Stacks c) Queues d) Set e) Map

Week 3, 4:

2. (i) Perform setting up and Installing Hadoop in its three operating modes:
   - Standalone
   - Pseudo distributed
   - Fully distributed

   (ii) Use web based tools to monitor your Hadoop setup.

Week 5:

3. Implement the following file management tasks in Hadoop:
   - Adding files and directories
   - Retrieving files
   - Deleting files

Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

Week 6:

4. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

Week 7:

5. Write a Map Reduce program that mines weather data.

Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.

Week 8:

6. Implement Matrix Multiplication with Hadoop Map Reduce

Week 9, 10:

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, Project, and filter your data.

Week 11, 12:

8. Install and Run Hive then use Hive to create, alter, and drop Databases, tables, views, functions, and indexes

IV YEAR B.Tech. CSE - I Sem

L	T	P	C
0	0	3	2

INTERNET OF THINGS LAB

List of Experiments

Week 1 & 2:

1. Setting up your Raspberry Pi. Installation of software.
2. Introduction to Raspberry Pi & Sensors
   a. **Temperature Sensors**
   b. **Proximity Sensors**
   c. **Pressure Sensors**
3. Introduction to Sensors &Actuators
   a. **Humidity Sensors**
   b. **Accelerometer & Gyroscope**
   c. **Actuators**

   Ex: Motors

Week 3:

1. Introduction to IoT with The Thing Box & IFTTT

Week 4& 5:

1. Build your own Raspberry Pi Web Server

Week 6:

1. Build a Web-App: Blinking an LED over Internet

Week 7&8:

1. Live Temperature and Humidity Monitoring over Internet

Week 9&10:

1. Introduction to Open Source Cloud Platforms for IoT: OpenIoT, ThingSpeak, thinger.io, Google Cloud Platform.

Week 11& 12:

1. IoT based Home Security System with Email

IV YEAR B.Tech. CSE - I Sem	L	T	P	C
	0	0	3	2

IMAGE PROCESSING with SCI LAB

List of Experiments

1. Display of Grayscale Images.
2. Histogram Equalization.
3. Non-linear Filtering.
4. Edge detection using Operators.
5. 2-D DFT and DCT.
6. Filtering in frequency domain.
7. Display of color images.
8. Conversion between color spaces.
9. DWT of images.
10. Segmentation using watershed transform.

IV YEAR B.Tech. CSE - I Sem	L	T	P	C
	0	0	3	2

MOBILE APPLICATION DEVELOPMENT LAB

LIST OF EXPERIMENTS

1 **Installation of Java Wireless Toolkit (J2ME)**

2 **Working with J2ME Features**
- Menu Creation
- Menu Events
- On Line Help MIDlet
- Input checking – Phone number

3 **Threads and Highlevel User Interfaces**
- Text Slide Show
- Image Slide Show
- Implementing Non Interactive Gauge
- Quiz MIDLet

4 **Working on Drawing and Images**
- Immutable Image
- Image Clip Region
- Implementing Bar Graph
- Implementing Pie Graph
- KeyPad Events

5 **Developing Networked Applications using the Wireless Toolkit**

6 **Authentication with Web Server**

7 &8 **Web Application using J2ME**

Part – C

Syllabi of

B.Tech. IV Year II Semester

IV YEAR B.Tech. CSE - II Sem	L	T	P	C
	3	1	0	3

DESIGN PATTERNS

Course Outcomes:

At the end of this course, the student would be able to

1. Understand the Design patterns in software applications.
2. Discuss the Creational Patterns
3. Categorize the Structural Pattern.
4. Investigate Behavior Patterns
5. Construct the good design pattern structures

UNIT-I

Introduction

What is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design patterns, Organizing the Catalog, How Design patterns solve Design problems, How to select a Design Pattern, How to use a Design Pattern.

A Case Study

Designing a Document Editor, Design Problems, Document Structure, Formatting Embellishing the User Interface, Supporting Multiple Look and Feel Standards, Supporting Multiple Window systems, User Operations Spelling Checking and Hyphenation, Summary.

UNIT-II

Creational Patterns

Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-III

Structural Patterns

Adaptor, Bridge and Composite, Decorator, Facade, Flyweight, proxy

UNIT-IV

Behavior Patterns

Chain of Responsibility, Command, Interpreter, and Iterator, Mediator, Memento, Observer, State, strategy, Template Method, Visitor, Discussion on Behavioral Patterns.

UNIT-V

What to Expect from Design Patterns

A brief History, The Pattern Community, An Invitation, A Parting Thought.

TEXT BOOK

1. Design Patterns: Elements of Reusable Object-Oriented Software; By Erich Gamma, Pearson Education.

REFERENCE BOOKS

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley Dream Tech.
2. Pattern's in JAVA Vol – II BY Mark Grand, Wiley Dream Tech.
3. JAVA Enterprise Design Patterns Vol – III By Mark Grand, Wiley Dream TECH.
4. Head First Design Patterns By Eric Freeman – Oreilly – spd.
5. Peeling Design Patterns, Prof Meda Srinivasa Rao, Narsimha Karumanchi, Career Monk Publication.
6. Design Patterns Explained By Alan Shallowy, Pearson Education.
7. Pattern Oriented Software Architecture, af.Buschman & others, John Wiley & Sons.

IV YEAR B.Tech. CSE - II Sem	L	T	P	C
	3	1	0	3

MACHINE LEARNING

Course Outcomes:

At the end of this course, the student would be able to:

1. Relate Learning System along with Concept learning Task.
2. Understand decision trees and artificial neural networks.
3. Evaluate Hypothesis accuracy and Bayesian Learning.
4. Evaluate Computation Learning and Instance Based Learning.
5. Apply machine learning algorithms in Genetic Learning and Reinforcement Learning.

UNIT-I

Introduction

Well proposed Learning Problems, Designing a Learning System, perspectives and Issues in Machine Learning.

Concept Learning and General – to- Specific ordering: introduction, A concept learning Task, Concept learning as Search, Find-S, Version Spaces And Candidate _-Elimination Algorithms, Remarks, Inductive Bias.

UNIT-II

Decision Tree Learning

Introduction, Decision Tree Representation, Problems for Decision Tree Learning, Basic Decision Tree Learning Algorithms, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning.

Artificial Neural Network: Neural Network Representation, Problems for Neural Networks, Perceptrons, Multilayer and Back Propagation Algorithm , Remarks on Back Propagation Algorithm, Face Recognition example.

UNIT-III

Evaluating Hypothesis

Estimating Hypothesis Accuracy, basics of Sampling Theory, General Approach for Deriving Confidence Intervals, Difference in Error of Two Hypothesis, Comparing Learning Algorithms.

Bayesian Learning

Introduction, Bayes theorem, Bayes theorem and Concept Learning, Maximum Likelihood and Least-Squared Error Hypothesis, Maximum Likelihood for Predicting Probabilities ,Minimum Description Length Principle, Bayes Classifier, Gibbs algorithm, Naïve Bayes Classifier, Bayesian Belief Networks, EM Algorithm

UNIT-IV

Computation Learning Theory

Probably Learning an Approximately Correct Hypothesis, Sample Complexity for Finite Hypothesis Space, Sample Complexity for Infinite Hypothesis Space, Mistake Bound model for Learning.

Instance Based Learning

K-Nearest Neighborhood Learning, Locally Weighted Regression, Radial basis function, Case Based reasoning.

UNIT-V

Genetic Learning

Introduction, Genetic Algorithms, Hypothesis Space Search, Genetic Programming, Models of Evolution & Learning, Parallelizing Genetic Algorithms.

Reinforcement Learning

Introduction, learning task, Q Learning, Non-Deterministic Actions & rewards, temporal different learning, Generalizing from Examples, Relation to Dynamic Programming

TEXT BOOK

1. Machine Learning, Tom Mitchell, McGraw Hill, 1997.

REFERENCE BOOKS

1. Trevor Has tie, Robert Tibshirani& Jerome Friedman. The Elements of Statically Learning, Springer Verlag, 2001.
2. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
3. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc., 2001.
4. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.

IV YEAR B.Tech. CSE - II Sem	L	T	P	C
	3	1	0	3

SEMANTIC WED AND SOCIAL NETWORKS

Course Objectives:

At the end of this course, the student would be able to

1. Understand knowledge representation for the Semantic Web Intelligence
2. Identify the role of Ontologies in the semantic web.
3. Learn Ontology Engineering.
4. Develop Semantic Web Applications and Services.
5. Create OWL-S Ontology for Web Services.

UNIT-I

Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web

UNIT-II

Ontologies and their role in the semantic web; Ontologies Languages for the Semantic Web —Resource Description Framework (RDF) / RDF Schema; Ontology Web Language (OWL), UML, XML/XML Schema.

UNIT-III

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT-IV

Logic, Rule and Inference Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.

UNIT-V

XML-based Web Services, Next Generation Web Services, Creating an OWL-S Ontology for Web Services. Semantic Search Technology, Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods.

TEXT BOOKS

1. Thinking on the Web – Berners Lee, Gödel and Turing, Wiley interscience, 2008.

REFERENCE BOOKS

1. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.
2. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Audi Studer, Paul Warren, John Wiley & Sons.
3. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
4. Information sharing on the semantic Web – Heiner Stucken schmidt; Frank Van Harmelen, Springer Publications.

Part – D

OPEN ELECTIVES

OPEN ELECTIVES

Introduction

The B.Tech course structure under CBCS consists of 4 Professional Electives and 3 open electives. Each professional elective offered by the students own department gives a choice of three to four courses out of which the student is to select one course. Similarly under open elective system, the student is offered one course each in 3 semesters viz., 3/1, 3/2 & 4/1 with 3 credits.

The six engg. and along with MBA depts. of the college have been divided into four groups
Group- I - ECE & EEE
Group –II - CSE & IT
Group –III - Mechanical & Civil
Group –IV- MBA
Under CBCS, a student from a particular group cannot opt the courses offered by that particular group.

Details of the Courses offered by different Groups
Courses offered by Group -1 Departments

ECE
IV Year – I Semester
1. Introduction to MATLAB
2. Circuit Simulation using PSpice

EEE
IV Year – I Semester
1. Electrical and Hybrid Vehicle
2. Energy Storage Systems
Courses offered by Group-2 Departments
CSE/IT
IV Year – I Semester
1. Information Systems for Engineers
2. Web Design

Courses offered by Group-3 Departments

MECH

IV Year – I Semester

1. Optimization Techniques
2. Maintenance and Safety Engineering

CIVIL

IV Year – I Semester

1. Elements of Civil Engineering
2. Introduction to Earthquake Engineering

Courses offered by Group-4 Department

MBA

I Semester

Fundamentals of Entrepreneurship

L	T	P	C
3	1	0	3

INFORMATION SYSTEMS FOR ENGINEERS
(OPEN ELECTIVE-3)

Course Outcomes: At the end of this course, the student would be able to

1. Understand the basic concepts of Information Systems applicable to Engineers.
2. Study the design, development and security of Information Systems.
3. Learn the various modules in ethical and social issues while using Information Systems.
4. Understand issues in data security.
5. Implement the ethics in information systems.

UNIT-I
Introduction
Introduction to Information Technology - Need for information technology; information technology firms - what they are and how they do things; Opportunities in the IT industries.

UNIT-II
Systems Design
Information Systems: Concepts and overview of information systems; Systematic framework for information systems; Components of information systems; information systems design, analysis and management, types Information Systems.

UNIT-III
Database Management Systems
Database Management Systems for information Systems: Data resources, structure and functional aspects: graphic database, data storage and hypermedia; Data design issues and output designs.

UNIT-IV
Data Security
Information Systems Security –System Vulnerability and abuse – improve Business value of security & control using various technologies – framework security and control – recent technologies and tools for protecting information resources.

UNIT-V
Ethics in Information Systems
Ethical and Social Issues in Information Systems – ethics in an information society – moral dimensions of Information Systems – role of Government in information technology.

TEXT BOOKS

1. Kenneth C. Laudon & Jane P.Laudon, "Management Information Systems" Managing the Digital Firm-Twelfth Edition, Pearson.
2. Gerald V.Post David L. Anderson, "Management Information System-Solving Business Problems with Information Technology" Tata McGraw Hill Publishing Co. ltd, New Delhi

REFERENCES

1. Alexis Leon, "Enterprise Resource Planning" Tata McGraw Hill Publishing Co. Ltd., New Delhi – 2005
2. Raymond Meleod, JR "Information Systems" Mac Millan Publishing Co. ltd4th Edition.

L	T	P	C
3	1	0	3

WEB DESIGN
(OPEN ELECTIVE-3)

Course Outcomes: At the end of this course, the student would be able to

1. List the HTML tags
2. Understand different style sheets.
3. Explain the client side scripting through JavaScript
4. Examine the server side scripting language through PHP
5. Examine the server side programming using JSP

UNIT-I
Introduction
HTML basics tags - LIST – unordered list – nested and ordered list – Basic HTML Tables – Intermediate HTML table and Formatting – basic HTML Forms and Formatting –More Complex HTML Forms – Frames -Frameset Element – Nested Frameset, page layout and navigation.

UNIT-II
CSS
Style Sheets: Introduction to Style sheets – Formatting Text by Using Style Sheets – Formatting Paragraphs by Using Style Sheets

UNIT-III
Client Side Scripting
JavaScript language- Declaring variables, scope of the variables, functions, Objects in Java Script, Dynamic HTML with Java Script, Form validation.

UNIT-IV
Introduction to PHP
Variable Declaration, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc.
File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files, listing directories.
Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

UNIT-V
Introduction to JSP:
The Anatomy of a JSP Page; JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

TEXT BOOKS

1. Faithe Wempen,*"Microsoft Step by Step – HTML and XH"*, Prentice Hall of India Private Limited, New Delhi,2011.
2. The complete reference –PHP by Steven Holzner

REFERENCES

1. Achyut S Godbole&AtulKahate, "*WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures*", TMH 2007
2. Thomas A. Powell, McGraw-Hill *"HTML & CSS: The Complete Reference"*, Fifth Edition (Complete Reference Series) Osborne Media; 5 edition, 2010.
3. Java Server Pages -Hans Bergsten, SPD O'Reilly.

ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

COMPUTER SCIENCE AND ENGINEERING

For

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2013-14)

(I - IV Years Syllabus)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
KUKATPALLY, HYDERABAD - 500 085.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD.

B. TECH. COMPUTER SCIENCE AND ENGINEERING

I YEAR

Code	Subject	L	T/P/D	C
A10001	English	2	-	4
A10002	Mathematics – I	3	1	6
A10003	Mathematical Methods	3	-	6
A10004	Engineering Physics	3	-	6
A10005	Engineering Chemistry	3	-	6
A10501	Computer Programming	3	-	6
A10301	Engineering Drawing	2	3	6
A10581	Computer Programming Lab.	-	3	4
A10081	Engineering Physics / Engineering Chemistry Lab.	-	3	4
A10083	English Language Communication Skills Lab.	-	3	4
A10082	IT Workshop / Engineering Workshop	-	3	4
	Total	**19**	**16**	**56**

II YEAR I SEMESTER

Code	Subject	L	T/P/D	C
A30008	Probability and Statistics	4	-	4
A30504	Mathematical Foundations of Computer Science	4	-	4
A30502	Data Structures	4	-	4
A30401	Digital Logic Design	4	-	4
A30404	Electronic Devices and Circuits	4	-	4
A30202	Basic Electrical Engineering	4	-	4
A30282	Electrical and Electronics Lab	-	3	2
A30582	Data Structures Lab	-	3	2
	Total	**24**	**6**	**28**

II YEAR II SEMESTER

Code	Subject	L	T/P/D	C
A40506	Computer Organization	4	-	4
A40507	Database Management Systems	4	-	4
A40503	Java Programming	4	-	4
A40009	Environmental studies	4	-	4
A40509	Formal Languages and Automata Theory	4	-	4
A40508	Design and Analysis of Algorithms	4	-	4
A40585	Java Programming Lab	-	3	2
A40584	Database Management Systems Lab	-	3	2
	Total	**24**	**6**	**28**

III YEAR I SEMESTER

Code	Subject	L	T/P/D	C
A50511	Principles of Programming Languages	4	-	4
	OPEN ELECTIVE	4	-	4
A50018	Human Values and Professional Ethics			
A50017	Intellectual Property Rights			
A50117	Disaster Management			
A50518	Software Engineering	4	-	4
A50514	Compiler Design	4	-	4
A50510	Operating Systems	4	-	4
A50515	Computer Networks	4	-	4
A50589	Operating Systems Lab	-	3	2
A50587	Compiler Design Lab	-	3	2
	Total	**24**	**6**	**28**

III YEAR II SEMESTER

Code	Subject	L	T/P/D	C
A60521	Distributed Systems	4	-	4
A60522	Information Security	4	-	4
A60524	Object Oriented Analysis and Design	4	-	4
A60525	Software Testing Methodologies	4	-	4
A60010	Managerial Economics and Financial Analysis	4	-	4
A60512	Web Technologies	4	-	4
A60591	Case Tools and Web Technologies Lab	-	3	2
A60086	Advanced Communication Skills Lab	-	3	2
	Total	**24**	**6**	**28**

IV YEAR I SEMESTER

Code	Subject	L	T/P/D	C
A70511	Linux Programming	4	-	4
A70530	Design Patterns	4	-	4
A70520	Data Warehousing and Data Mining	4	-	4
A70519	Cloud Computing	4	-	4
	ELECTIVE – I	4	-	4
A70540	Software Project Management			
A70532	Image processing and Pattern Recognition			
A70536	Mobile Computing			
A70529	Computer Graphics			
A70352	Operations Research			
	ELECTIVE – II	4	-	4
A70534	Machine Learning			
A70539	Soft Computing			
A70533	Information Retrieval Systems			
A70526	Artificial Intelligence			
A70628	Computer Forensics			
A70596	Linux Programming Lab	-	3	2
A70595	Data Warehousing and Mining Lab	-	3	2
	Total	**24**	**6**	**28**

IV YEAR II SEMESTER

Code	Subject	L	T/P/D	C
A80014	Management Science	4	-	4
	ELECTIVE III	4	-	4
A80551	Web Services			
A80538	Semantic Web and Social Networks			
A80537	Scripting Languages			
A80547	Multimedia & Rich Internet Applications			
	ELECTIVE – IV	4	-	4
A80542	Ad hoc and Sensor Networks			
A80550	Storage Area Networks			
A80543	Database Security			
A80439	Embedded Systems			
A80087	Industry Oriented Mini Project	-	-	2
A80089	Seminar	-	6	2
A80088	Project Work	-	15	10
A80090	Comprehensive Viva	-	-	2
	Total	**12**	**21**	**28**

Note: All End Examinations (Theory and Practical) are of three hours duration.
T-Tutorial L – Theory P – Practical D-Drawing C – Credits

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	2	**-/-/-**	**4**

(A10001) ENGLISH

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation.
2. To equip students with necessary training in listening so that they

can comprehend the speech of people of different backgrounds and regions.

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: **Skills Annexe -Functional English for Success)**
- Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Scanning
- Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/ newspaper articles.

Writing Skills :

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill.
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

- Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units, are prescribed:

For Detailed study: First Textbook: "Skills Annexe -Functional English for Success", Published by Orient Black Swan, Hyderabad

For Non-detailed study

1. **Second text book "Epitome of Wisdom",** Published by Maruthi Publications, Guntur
   - The course content and study material is divided into Five Units.

Unit –I:

1. Chapter entitled **'Wit and Humour**' from **"Skills Annexe -Functional English for Success"**, Published by Orient Black Swan, Hyderabad
2. Chapter entitled **'Mokshagundam Visvesvaraya'** from **"Epitome of Wisdom**", Published by Maruthi Publications, Hyderabad.

L- Listening For Sounds, Stress and Intonation

S- Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)

R- Reading for Subject/ Theme

W- Writing Paragraphs

G- Types of Nouns and Pronouns

V- Homonyms, homophones synonyms, antonyms

Unit –II

1. Chapter entitled **"Cyber Age"** from **"Skills Annexe -Functional English for Success"** Published by Orient Black Swan, Hyderabad.
2. Chapter entitled **'Three Days To See'** from **"Epitome of Wisdom"**, Published by Maruthi Publications, Hyderabad.

L – Listening for themes and facts

S – Apologizing, interrupting, requesting and making polite conversation

R- for theme and gist

W- Describing people, places, objects, events

G- Verb forms

V- noun, verb, adjective and adverb

Unit –III

1. Chapter entitled **'Risk Management'** from **"Skills Annexe - Functional English for Success"** Published by Orient Black Swan, Hyderabad
2. Chapter entitled **'Leela's Friend'** by R.K. Narayan from **"Epitome of Wisdom"**, Published by Maruthi Publications, Hyderabad

L – for main points and sub-points for note taking

S – giving instructions and directions; Speaking of hypothetical situations

R – reading for details

W – note-making, information transfer, punctuation

G – present tense

V – synonyms and antonyms

Unit –IV

1. Chapter entitled **'Human Values and Professional Ethics'** from **"Skills Annexe -Functional English for Success"** Published by Orient Black Swan, Hyderabad
2. Chapter entitled **'The Last Leaf'** from **"Epitome of Wisdom"**, Published by Maruthi Publications, Hyderabad

L - Listening for specific details and information

S- narrating, expressing opinions and telephone interactions

R - Reading for specific details and information

W- Writing formal letters and CVs

G- Past and future tenses

V- Vocabulary - idioms and Phrasal verbs

Unit –V

1. Chapter entitled **'Sports and Health'** from **"Skills Annexe - Functional English for Success"** Published by Orient Black Swan, Hyderabad
2. Chapter entitled **'The Convocation Speech'** by N.R. Narayanmurthy' from **"Epitome of Wisdom"**, Published by Maruthi Publications, Hyderabad

L- Critical Listening and Listening for speaker's tone/ attitude

S- Group discussion and Making presentations

R- Critical reading, reading for reference

W- Project proposals; Technical reports, Project Reports and Research Papers

G- Adjectives, prepositions and concord

V- Collocations and Technical vocabulary

Using words appropriately

* Exercises from the texts not prescribed shall also be used for classroom tasks.

REFERENCES :

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.

11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw – Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publishers

Outcomes:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency
- Gaining confidence in using language in verbal situations.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech. CSE	**L**	**T/P/D**	**C**
	3	**1/-/-**	**6**

(A10002) MATHEMATICS -I

Objectives: To learn

- The types of Matrices and their properties
- Concept of rank of a matrix and applying the concept of rank to know the consistency of linear equations and to find all possible solutions, if exist.
- The concept of eigenvalues and eigenvectors of a matrix is to reduce a quadratic form into a canonical form through a linear transformation.
- The mean value theorems and to understand the concepts geometrically.
- The functions of several variables and optimization of these functions.
- The evaluation of improper integrals, Beta and Gamma functions.
- Multiple integration and its applications.
- Methods of solving the differential equations of 1st and higher order
- The applications of the differential equations to Newton's law of cooling, Natural growth and decay, Bending of beams etc.
- The definition of integral transforms and Laplace Transform.
- Properties of Laplace transform.
- Inverse Laplace Transform.
- Convolution theorem.
- Solution of Differential equations using Laplace transform.

UNIT-I

Theory of Matrices: Real matrices – Symmetric, skew – symmetric, orthogonal. Complex matrices: Hermitian, Skew-Hermitian and Unitary Matrices. Idempotent matrix, Elementary row and column transformations-Elementary matrix, Finding rank of a matrix by reducing to Echelon and normal forms. Finding the inverse of a non-singular square matrix using row/ column transformations (Gauss- Jordan method). Consistency of system of linear equations (homogeneous and non- homogeneous) using the rank of a matrix. Solving m x n and n x n linear system of equations by Gauss elimination.

Cayley-Hamilton Theorem (without proof) – Verification. Finding inverse of a matrix and powers of a matrix by Cayley-Hamilton theorem, Linear dependence and Independence of Vectors. Linear Transformation – Orthogonal Transformation. Eigen values and eigen vectors of a matrix.

Properties of eigen values and eigen vectors of real and complex matrices. Finding linearly independent eigen vectors of a matrix when the eigen values of the matrix are repeated.

Diagonalization of matrix – Quadratic forms up to three variables. Rank – Positive definite, negative definite, semi definite, index, signature of quadratic forms. Reduction of a quadratic form to canonical form.

UNIT – II

Differential calculus methods: Rolle's Mean value Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – (all theorems without proof but with geometrical interpretations), verification of the Theorems and testing the applicability of these theorem to the given function.

Functions of several variables: Functional dependence- Jacobian- Maxima and Minima of functions of two variables without constraints and with constraints-Method of Lagrange multipliers.

UNIT – III

Improper integration, Multiple integration & applications: Gamma and Beta Functions –Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions

Multiple integrals – double and triple integrals – change of order of integration-change of variables (polar, cylindrical and spherical) Finding the area of a region using double integration and volume of a region using triple integration.

UNIT – IV

Differential equations and applications: Overview of differential equations-exact, linear and Bernoulli (NOT TO BE EXAMINED). Applications of first order differential equations – Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

Linear differential equations of second and higher order with constant coefficients, Non-homogeneous term of the type f(X) = e^{ax} , Sin ax, Cos ax, and x^n , e^{ax} V(x), x^n V(x), method of variation of parameters. Applications to bending of beams, Electrical circuits and simple harmonic motion.

UNIT – V

Laplace transform and its applications to Ordinary differential equations Definition of Integral transform, Domain of the function and Kernel for the Laplace transforms. Existence of Laplace transform. Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied or divided by "t". Laplace transforms of derivatives and integrals of functions. – Unit step function – second shifting theorem – Dirac's delta function, Periodic function – Inverse Laplace transform by Partial fractions(Heaviside method) Inverse Laplace transforms of functions

when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem –- Solving ordinary differential equations by Laplace transforms.

TEXT BOOKS:

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
2. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
3. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
4. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
5. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
6. Mathematics for Engineers and Scientists, Alan Jeffrey, 6th Edi, 2013, Chapman & Hall/ CRC
7. Advanced Engineering Mathematics, Michael Greenberg, Second Edition, Pearson Education.

Outcome:

- After learning the contents of this Unit the student is able to write the matrix representation of a set of linear equations and to analyze solutions of system of equations.
- The student will be able to understand the methods of differential calculus to optimize single and multivariable functions.
- The student is able to evaluate the multiple integrals and can apply the concepts to find the Areas, Volumes, Moment of Inertia etc., of regions on a plane or in space.
- The student is able to identify the type of differential equation and uses the right method to solve the differential equation. Also able to apply the theory of differential equations to the real world problems.
- The student is able to solve certain differential equations using Laplace Transform. Also able to transform functions on time domain to frequency domain using Laplace transforms.

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(A10003) MATHEMATICAL METHODS

Objectives:

- The objective is to find the relation between the variables x and y out of the given data (x,y).
- This unit also aims to find such relationships which exactly pass through data or approximately satisfy the data under the condition of least sum of squares of errors.
- The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data.
- This topic deals with methods to find roots of an equation and solving a differential equation.
- The numerical methods are important because finding an analytical procedure to solve an equation may not be always available.
- In the diverse fields like electrical circuits, electronic communication, mechanical vibration and structural engineering, periodic functions naturally occur and hence their properties are very much required.
- Indeed, any periodic and non-periodic function can be best analyzed in one way by Fourier series and transforms methods.
- The unit aims at forming a partial differential equation (PDE) for a function with many variables and their solution methods. Two important methods for first order PDE's are learnt. While separation of variables technique is learnt for typical second order PDE's such as Wave, Heat and Laplace equations.
- In many Engineering fields the physical quantities involved are vector-valued functions.
- Hence the unit aims at the basic properties of vector-valued functions and their applications to line integrals, surface integrals and volume integrals.

UNIT – I:

Interpolation and Curve fitting:

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols- Difference Equations – Differences of a polynomial-Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae –

Interpolation with unevenly spaced points-Lagrange's Interpolation formula. B. Spline interpolation – Cubic spline.

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

UNIT – II :

Numerical techniques:

Solution of Algebraic and Transcendental Equations and Linear system of equations: Introduction – Graphical interpretation of solution of equations .The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method .

Solving system of non-homogeneous equations by L-U Decomposition method(Crout's Method)Jacobi's and Gauss-Seidel Iteration method

Numerical Differentiation, Integration, and Numerical solutions of First order differential equations: Numerical differentiation, Numerical integration - Trapezoidal rule, Simpson's $1/3^{rd}$ and 3/8 Rule , Generalized Quadrature.

Numerical solution of Ordinary Differential equations: Solution by Taylor's series method –Picard's Method of successive Approximation- single step methods-Euler's Method-Euler's modified method, Runge-Kutta Methods ,Predictor –corrector methods(Milne's Method and Adams-Bashforth methods only).

UNIT – III:

Fourier series and Fourier Transforms: Definition of periodic function.

Fourier expansion of periodic functions in a given interval of length 2π

Determination of Fourier coefficients – Fourier series of even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT-IV:

Partial differential equations : Introduction and Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and non-linear equations (Charpit's method), Method of separation of variables for second order equations –Applications of Partial differential equations-Two dimensional wave equation., Heat equation.

UNIT – V

Vector Calculus: Vector Calculus: Scalar point function and vector point

function, Gradient- Divergence- Curl and their related properties, - Laplacian operator, Line integral – work done – Surface integrals -Volume integral. Green's Theorem, Stoke's theorem and Gauss's Divergence Theorems (Statement & their Verification). Solenoidal and irrotational vectors, Finding Potential function.

TEXT BOOKS:

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi & Others, S. Chand.
2. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
3. Mathematical Methods by G.Shankar Rao, I.K. International Publications, N.Delhi
4. Mathematical Methods by V. Ravindranath, Etl, Himalaya Publications.
5. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, 2013, CRC Press Taylor & Francis Group.
6. Mathematics for Engineers and Scientists, Alan Jeffrey, 6th Edi, 2013, Chapman & Hall/ CRC
7. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

Outcomes:

From a given discrete data, one will be able to predict the value of the data at an intermediate point and by curve fitting, can find the most appropriate formula for a guessed relation of the data variables. This method of analysis data helps engineers to understand the system for better interpretation and decision making

- After studying this unit one will be able to find a root of a given equation and will be able to find a numerical solution for a given differential equation.
- Helps in describing the system by an ODE, if possible. Also, suggests to find the solution as a first approximation.
- One will be able to find the expansion of a given function by Fourier series and Fourier Transform of the function.
- Helps in phase transformation, Phase change and attenuation of coefficients in acoustics.

- After studying this unit, one will be able to find a corresponding Partial Differential Equation for an unknown function with many independent variables and to find their solution.
- Most of the problems in physical and engineering applications, problems are highly non-linear and hence expressing them as PDEs'. Hence understanding the nature of the equation and finding a suitable solution is very much essential.
- After studying this unit, one will be able to evaluate multiple integrals (line, surface, volume integrals) and convert line integrals to area integrals and surface integrals to volume integrals.
- It is an essential requirement for an engineer to understand the behavior of the physical system.

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(A10004) ENGINEERING PHYSICS

Objectives:

It gives

- to the students basic understanding of bonding in solids, crystal structures and techniques to characterize crystals.
- to understand the behavior of electron in a solid and thereby one can determine the conductivity and specific heat values of the solids.
- to study applications in Engineering like memory devices, transformer core and Electromagnetic machinery.
- to help the student to design powerful light sources for various Engineering Applications and also enable them to develop communication systems using Fiber Technology.
- to understand the working of Electronic devices, how to design acoustic proof halls and understand the behavior of the materials at Nano scale.

UNIT-I

Crystallography: Ionic Bond, Covalent Bond, Metallic Bond, Hydrogen Bond, Vander-Waal's Bond, Calculation of Cohesive Energy of diatomic molecule-Space Lattice**,** Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal Systems, Structure of Diamond and NaCl.

X-ray Diffraction & Defects in Crystals: Bragg's Law, X-Ray diffraction methods: Laue Method, Powder Method**:** Point Defects: Vacancies, Substitutional, Interstitial, Frenkel and Schottky Defects, line defects (Qualitative) & Burger's Vector.

UNIT-II

Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis , Matter Waves, Davisson and Germer' Experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation - Physical Significance of the Wave Function – Infinite square well potential, extension to three dimensions

Elements of Statistical Mechanics & Electron theory of Solids: Phase space, Ensembles, Micro Canonical , Canonical and Grand Canonical Ensembles **-** Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics (Qualitative Treatment), Concept of Electron Gas, , Density of States, Fermi

Energy- Electron in a periodic Potential, Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), E-K curve, Origin of Energy Band Formation in Solids, Concept of Effective Mass of an Electron, Classification of Materials into Conductors, Semi Conductors & Insulators.

UNIT-III

Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities: Ionic and Electronic - Internal Fields in Solids, Clausius - Mossotti Equation, Piezo - electricity and Ferro- electricity.

Magnetic Properties & Superconducting Properties: Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magneton, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials and their Applications, Superconductivity, Meissner Effect, Effect of Magnetic field, Type-I & Type-II Superconductors, Applications of Superconductors.

UNIT-IV

Optics: Interference-Interference in thin films (Reflected light), Newton rings experiment- Fraunhofer diffraction due to single slit, N-slits, Diffraction grating experiment , Double refraction-construction and working of Nicol's Prism

Lasers & Fiber Optics: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and Relation between them, Population Inversion, Lasing Action, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers- Principle of Optical Fiber, Construction of fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers: Step Index and Graded Index Fibers, Attenuation in Optical Fibers, Application of Optical Fiber in communication systems.

UNIT-V:

Semiconductor Physics: Fermi Level in Intrinsic and Extrinsic Semiconductors, Calculation of carrier concentration in Intrinsic &, Extrinsic Semiconductors, Direct and Indirect Band gap semiconductors, Hall Effect-Formation of PN Junction, Open Circuit PN Junction, Energy Diagram of PN Diode, Diode Equation, I-V Characteristics of PN Junction diode, Solar cell, LED & Photo Diodes. **Acoustics of Buildings & Acoustic Quieting:** Reverberation and Time of Reverberation, Sabine's Formula for Reverberation Time, Measurement of Absorption Coefficient of a Material, factors affecting the Architectural Acoustics and their Remedies

Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume

Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Top-down Fabrication: Chemical Vapour Deposition, Characterization by TEM.

TEXT BOOKS:

1. Engineering Physics,K. Malik, A. K. Singh, Tata Mc Graw Hill Book Publishers.
2. Engineering Physics, V. Rajendran, Tata Mc Graw Hill Book Publishers.

REFERENCES:

1. Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker by John Wiley & Sons.
2. Sears and Zemansky's University Physics (10th Edition) by Hugh D. Young Roger A. Freedman, T. R. Sandin, A. Lewis FordAddison-Wesley Publishers.
3. Applied Physics for Engineers – P. Madhusudana Rao (Academic Publishing company, 2013).
4. Solid State Physics – M. Armugam (Anuradha Publications).
5. Modern Physics – R. Murugeshan & K. Siva Prasath – S. Chand & Co. (for Statistical Mechanics).
6. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co. (for acoustics).
7. Modern Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand & Co.Ltd.
8. Nanotechnology – M.Ratner & D. Ratner (Pearson Ed.).
9. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
10. Solid State Physics – A.J. Dekker (Macmillan).
11. Applied Physics – Mani Naidu Pearson Education.

Outcomes:

- The student would be able to learn the fundamental concepts on behavior of crystalline solids.
- The knowledge on Fundamentals of Quantum Mechanics, Statistical Mechanics enables the student to apply to various systems like Communications Solar Cells, Photo Cells and so on.
- Design, Characterization and study of properties of materials help the student to prepare new materials for various Engineering applications.
- This course also helps the student exposed to non-destructive testing methods.
- Finally, Engineering Physics Course helps the student to develop problem solving skills and analytical skills.

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(A10005) ENGINEERING CHEMISTRY

Objective:

An engineer is as someone who uses scientific, natural and physical principles to design something of use for people or other living creatures. Much of what any engineer does involves chemistry because everything in our environment has a molecular make up. Engineering requires the concepts of applied chemistry and the more chemistry an engineer understands, the more beneficial it is. In the future, global problems and issues will require an in-depth understanding of chemistry to have a global solution. This syllabus aims at bridging the concepts and theory of chemistry with examples from fields of practical application, thus reinforcing the connection between science and engineering. It deals with the basic principles of various branches of chemistry which are fundamental tools necessary for an accomplished engineer.

UNIT I:

Electrochemistry & Corrosion: Electro Chemistry – Conductance - Specific, Equivalent and Molar conductance and their Units; Applications of Conductance (Conductometric titrations). **EMF:** Galvanic Cells, types of Electrodes – (Calomel, Quinhydrone and glass electrodes); Nernst equation and its applications ; concept of concentration cells, electro chemical series, Potentiometric titrations, determination of P^H using glass electrode-Numerical problems.

Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell, Lithium cells). Applications of batteries. **Fuel cells** – Hydrogen – Oxygen fuel cell; methanol – oxygen fuel cell ; Advantages and Applications.

Corrosion and its control: Causes and effects of corrosion; Theories of corrosion – Chemical & Electrochemical corrosion; Types of corrosion (Galvanic, Water line, Pitting and Intergranular); Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (sacrificial anodic and impressed current). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), Cementation, cladding, electroplating (copper plating) Electroless plating (Ni plating) - Organic coatings – Paints - constituents and their functions.

UNIT II:

Engineering Materials: Polymers: Types of Polymerization (Chain & Step growth).**Plastics:** Thermoplastic & Thermo setting resins; Compounding &

fabrication of plastics (Compression and injection moulding).Preparation, properties, engineering applications of PVC, Teflon and Bakelite. **Fibers-** Charcterstics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications. **Rubbers** – Natural rubber and its vulcanization. Elastomers – Buna-s, Butyl rubber and Thiokol rubber.

Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. **Bio-degradable Polymers**- preparation and Applications of Poly vinyl acetate and Poly lactic acid - **Cement:** composition of Portland cement, setting & hardening of cement (reactions), **Lubricants:** Classification with examples- Characterstics of a good lubricant & mechanism of lubrication (thick film, thin film and extreme pressure) – properties of lubricants: viscosity, Cloud point, flash and fire points. **Refractories:** Classification, characteristics of a good refractory and applications.

Nanomaterials: Introduction, preparation by sol-gel & chemical vapour deposition methods. Applications of nanomaterials.

UNIT III:

Water and its Treatment: Hardness of Water: Causes of hardness, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludges, Priming and foaming, caustic enbrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal and calgon conditioning) – External treatment – Lime Soda process, Zeolite process and ion exchange process. Numerical Problems. **Potable Water**- Its Specifications – Steps involved in treatment of potable water – Disinfection of water by chlorination and ozonisation. Reverse osmosis & its significance.

Unit – IV :

Fuels & Combustion: Fuels – Classification – soild fuels : coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining – cracking – types – fixed bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol, Bergius and Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG. Analysis of flue gas by Orsat's apparatus – Numerical Problems.

Combustion – Definition, Calorific value of fuel – HCV , LCV; Determination of calorific value by Junker's gas calorimeter – theoretical calculation of Calorific value by Dulong's formula – Numerical problems on combustion.

UNIT V:

Phase Rule & Surface Chemistry : **Phase Rule:** Definition of terms: Phase,

component, degree of freedom, phase rule equation. Phase diagrams – one component system- water system. Two component system Lead- Silver, cooling curves, heat treatment based on iron-carbon phase diagram - hardening, annealing and normalization.

Surface Chemistry: **Adsorption –** Types of Adsorption, Isotherms – Freundlich and Langmuir adsorption isotherm, applications of adsorption; **Colloids**: Classification of Colloids; Electrical & optical properties, micelles, applications of colloids in industry.

TEXT BOOKS:

1. Engineering Chemistry by R.P. Mani,K.N. Mishra, B. Rama Devi / CENGAGE learning.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).

REFERENCE BOOKS

1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited, New Delhi (2006)
2. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills Publishing Company Limited, New Delhi (2004).
3. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi (2006).
4. Chemistry of Engineering Materials by CV Agarwal,C.P Murthy, A.Naidu, BS Publications.

Outcome:

- Students will demonstrate a depth of knowledge and apply the methods of inquiry in a discipline of their choosing, and they will demonstrate a breadth of knowledge across their choice of varied disciplines.
- Students will demonstrate the ability to access and interpret information, respond and adapt to changing situations, make complex decisions, solve problems, and evaluate actions.
- Students will demonstrate awareness and understanding of the skills necessary to live and work in a diverse engineering world.

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(A10501) COMPUTER PROGRAMMING

Objectives:

- To understand the various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs.
- To learn to write programs (using structured programming approach) in C to solve problems.
- To introduce the students to basic data structures such as lists, stacks and queues.
- To make the student understand simple sorting and searching methods.

UNIT - I

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Program Development.

Introduction to the C Language – Background, C Programs, Identifiers, Types, Variables, Constants, Input / Output, Operators (Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Statements- Selection Statements (making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, goto, Simple C Program examples.

UNIT - II

Functions-Designing Structured Programs, Functions, user defined functions, inter function communication, Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Limitations of recursion, example C programs, Preprocessor commands.

Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C program examples.

UNIT - III

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, Pointer Applications-Arrays and Pointers, Pointer Arithmetic and arrays, Passing an array to a function,

memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions.

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

UNIT - IV

Enumerated, Structure, and Union Types– The Type Definition (typedef), Enumerated types, Structures –Declaration, initialization, accessing structures, operations on structures, Complex structures, structures and functions, Passing structures through pointers, self referential structures, unions, bit fields, C programming examples, command –line arguments.

Input and Output – Concept of a file, streams, text files and binary files, Differences between text and binary files, State of a file, Opening and Closing files, file input / output functions (standard library input / output functions for files), file status functions (error handling),Positioning functions, C program examples.

UNIT – V

Searching and Sorting – Sorting- selection sort, bubble sort, Searching-linear and binary search methods.

Lists- Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Push and Pop Operations, Queues- Enqueue and Dequeue operations.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh , Oxford University Press.

REFERENCE BOOKS:

1. C& Data structures – P. Padmanabham, Third Edition, B.S. Publications.
2. C for All, S. Thamarai Selvi, R.Murugesan, Anuradha Publications.
3. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, 7th Edition, Pearson education.
4. Programming in C, Ajay Mittal, Pearson.
5. Programming with C, B.Gottfried, 3rd edition, Schaum's outlines, TMH.
6. Problem solving with C, M.T.Somasekhara, PHI
7. Programming with C, R.S.Bickar, Universities Press.
8. Computer Programming & Data Structures, E.Balagurusamy, 4th edition, TMH.
9. Programming in C – Stephen G. Kochan, III Edition, Pearson

Education.

10. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
11. C Programming with problem solving, J.A. Jones & K. Harrow,Dreamtech Press.

Outcomes:

- Demonstrate the basic knowledge of computer hardware and software.
- Ability to apply solving and logical skills to programming in C language and also in other languages.

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(A10301) ENGINEERING DRAWING

UNIT – I

Introduction to Engineering Drawing: Principles of Engineering Drawing/ Graphics – Various Drawing Instruments – Conventions in Drawing – **Lettering practice** – BIS Conventions.

Curves: Constructions of Curves used in Engineering Practice:

a) Conic Sections including the Rectangular Hyperbola – General method only.

b) Cycloid, Epicycloid and Hypocycloid

c) Involute.

Scales: Construction of different types of Scales, Plain, Diagonal, Vernier scale.

UNIT – II

Orthographic Projections in First Angle

Projection: Principles of Orthographic Projections – Conventions – First and Third Angle projections.

Projections of Points : including Points in all four quadrants.

Projections of Lines : Parallel, perpendicular, inclined to one plan and inclined to both planes. True length and true angle of a line. Traces of a line.

Projections of Planes: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both the reference planes.

UNIT – III

Projections of Solids: Projections of regular solids, cube, prisms, pyramids, tetrahedran, cylinder and cone, axis inclined to both planes.

Sections and Sectional Views: Right Regular Solids – Prism, Cylinder, Pyramid, Cone – use of Auxiliary views.

UNIT – IV

Development of Surfaces: Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramids, Cone and their parts. frustum of solids.

Intersection of Solids:- Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – V

Isometric Projections : Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Plane Figures, Simple and Compound

Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of parts with Spherical surface.

Transformation of Projections : Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects.

Perspective Projections : Perspective View : Points, Lines and Plane Figures, Vanishing Point Methods (General Method only).

TEXT BOOKS

1. Engineering Drawing – Basant, Agrawal, TMH
2. Engineering Drawing, N.D. Bhatt

REFERENCES :

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J. Shah .S.Chand Publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson.
5 . Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age Publications.
6. Engineering Drawing by John. PHI Learning Publisher.

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(A10581) COMPUTER PROGRAMMING LAB

Objectives:

- To write programs in C to solve the problems.
- To implement linear data structures such as lists, stacks, queues.
- To implement simple searching and sorting methods.

Recommended Systems/Software Requirements:

- Intel based desktop PC
- ANSI C Compiler with Supporting Editors

Week I

a) Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 2

a) Write a C program to calculate the following Sum:

Sum=$1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b) Write a C program to find the roots of a quadratic equation.

Week 3

a) The total distance travelled by vehicle in 't' seconds is given by distance s = $ut+1/2at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

b) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Week 4

a) Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer.

ii) To find the GCD (greatest common divisor) of two given integers.

Week 5

a) Write a C program to find the largest integer in a list of integers.

b) Write a C program that uses functions to perform the following:

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

Week 6

a) Write a C program that uses functions to perform the following operations:

i) To insert a sub-string in to a given main string from a given position.

ii) To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not

Week 7

a) Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.

b) Write a C program to count the lines, words and characters in a given text.

Week 8

a) Write a C program to generate Pascal's triangle.

b) Write a C program to construct a pyramid of numbers.

Week 9

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:

$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Print x, n, the sum

Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

Week 10

a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

b) Write a C program to convert a Roman numeral to its decimal equivalent.

Week 11

Write a C program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(Note: represent complex number using a structure.)

Week 12

a) Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file.

(Note: The file name and n are specified on the command line.)

Week 13

a) Write a C program to display the contents of a file.

b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

Week 14

a) Write a C program that uses non recursive function to search for a Key value in a given list of integers using Linear search.

b) Write a C program that uses non recursive function to search for a Key value in a given sorted list of integers using Binary search.

Week 15

a) Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.

b) Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

Week 16

Write a C program that uses functions to perform the following operations:

i) Create a singly linked list of integer elements.

ii) Traverse the above list and display the elements.

Week 17

Write a C program that implements stack (its operations) using a singly linked list to display a given list of integers in reverse order. Ex. input: 10 23 4 6 output: 6 4 23 10

Week 18

Write a C program that implements Queue (its operations) using a singly linked list to display a given list of integers in the same order. Ex. input: 10

23 4 6 output: 10 23 4 6

Week 19

Write a C program to implement the linear regression algorithm.

Week 20

Write a C program to implement the polynomial regression algorithm.

Week 21

Write a C program to implement the Lagrange interpolation.

Week 22

Write C program to implement the Newton- Gregory forward interpolation.

Week 23

Write a C program to implement Trapezoidal method.

Week 24

Write a C program to implement Simpson method.

TEXT BOOKS:

1. C programming and Data Structures, P. Padmanabham, Third Edition, BS Publications
2. Computer Programming in C, V. Rajaraman, PHI Publishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMH Publishers.
4. C Programming, M.V.S.S.N.Prasad, ACME Learning Pvt. Ltd.
5. C and Data Structures, N.B.Venkateswarlu and E.V.Prasad,S.Chand Publishers
6. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publishers.

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(A10081) ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB

ENGINEERING PHYSICS LAB

(Any TEN experiments compulsory)

Objectives

This course on Physics lab is designed with 13 experiments in an academic year. It is common to all branches of Engineering in B.Tech Ist year.

The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student.

The experiments are selected from various areas of Physics like Physical Optics, Lasers, Fiber Optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.

Also the student is exposed to various tools like Screw gauge, Vernier Callipers, Physics Balance , Spectrometer and Microscope.

1. Dispersive power of the material of a prism – Spectrometer
2. Determination of wavelength of a source – Diffraction Grating.
3. Newton's Rings - Radius of curvature of plano convex lens.
4. Melde's experiment – Transverse and longitudinal modes.
5. Time constant of an R-C circuit.
6. L-C-R circuit.
7. Magnetic field along the axis of current carrying coil – Stewart and Gees method.
8. Study the characteristics of LED and LASER sources.
9. Bending losses of fibres & Evaluation of numerical aperture of a given fibre.
10. Energy gap of a material of p-n junction.
11. Torsional pendulum.
12. Wavelength of light –diffraction grating - using laser.
13. Characteristics of a solar cell

LABORATORY MANUAL:

1. Laboratory Manual of Engineering Physics by Dr.Y.Aparna & Dr.K.Venkateswara Rao (V.G.S Publishers)

Outcomes

The student is expected to learn from this laboratory course the concept of error and its analysis. It also allows the student to develop experimental skills to design new experiments in Engineering.

With the exposure to these experiments the student can compare the theory and correlate with experiment.

ENGINEERING CHEMISTRY LAB

List of Experiments (Any 12 of the following)

Titrimetry:

1. Estimation of ferrous iron by dichrometry.
2. Estimation of hardness of water by EDTA method.

Mineral analysis:

3. Determination of percentage of copper in brass.
4. Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:

Colorimetry:

5. Determination of ferrous iron in cement by colorimetric method
6. Estimation of copper by colorimetric method.

Conductometry:

7. Conductometric titration of strong acid vs strong base.
8. Conductometric titration of mixture of acids vs strong base.

Potentiometry:

9. Titration of strong acid vs strong base by potentiometry.
10. Titration of weak acid vs strong base by potentiometry.

Physical properties:

11. Determination of viscosity of sample oil by redwood / oswald's viscometer.
12. Determination of Surface tension of lubricants.

Preparations:

13. Preparation of Aspirin
14. Preparation of Thiokol rubber

Adsorption:

15. Adsorption of acetic acid on charcoal.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.,
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

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(A10083) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Objectives

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the **English Language Communication Skills Lab**

Exercise – I

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking activity and JAM session

Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise – II

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations

– Self-introduction and Introducing Others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Concord (Subject in agreement with verb) and Words often misspelt-confused/misused

Exercise - III

CALL Lab: Minimal Pairs- Word accent and Stress Shifts- Listening Comprehension.

ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.

Sequence of Tenses, Question Tags and One word substitutes.

Exercise – IV

CALL Lab: Intonation and Common errors in Pronunciation.

ICS Lab: Extempore- Public Speaking

Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise – V

CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice

ICS Lab: Information Transfer- Oral Presentation Skills

Reading Comprehension and Job Application with Resume preparation.

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System,

a T. V., a digital stereo –audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

1. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
2. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
3. Sasi Kumar, V & Dhamija, P.V. *How to Prepare for Group Discussion and Interviews.* Tata McGraw Hill
4. Hancock, M. 2009. *English Pronunciation in Use. Intermediate.* Cambridge: CUP
5. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
6. Hewings, M. 2009. *English Pronunciation in Use. Advanced.* Cambridge: CUP
7. Marks, J. 2009. *English Pronunciation in Use. Elementary.* Cambridge: CUP
8. Nambiar, K.C. 2011. *Speaking Accurately. A Course in International Communication.* New Delhi : Foundation
9. Soundararaj, Francis. 2012. *Basics of Communication in English. New Delhi: Macmillan*
10. **Spoken English** (CIEFL) in 3 volumes with 6 cassettes, OUP.
11. **English Pronouncing Dictionary** Daniel Jones Current Edition with CD.
12. **A textbook of English Phonetics for Indian Students** by T. Balasubramanian (Macmillan)
13. **Prescribed Lab Manual:** A Manual entitled "***English Language Communication Skills (ELCS) Lab Manual- cum- Work Book***", published by Cengage Learning India Pvt. Ltd, New Delhi. 2013

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation

during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year- end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

Outcomes:

- Better Understanding of nuances of language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

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(A10082) IT WORKSHOP / ENGINEERING WORKSHOP

Objectives:

The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. **The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.**

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools and LaTeX. (**Recommended to use Microsoft office 2007 in place of MS Office 2003)**

PC Hardware

Week 1 – Task 1 : Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Week 2 – Task 2 : Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 3 – Task 3 : Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 4 – Task 4 : Every student should install Linux on the computer. This

computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Week 5 – Task 5: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Week 6 – Task 6 : Software Troubleshooting : Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Week 7 - Task 1 : **Orientation & Connectivity Boot Camp :** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Week 8 - Task 2 : Web Browsers, Surfing the Web : Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Week 9 - Task 3 : **Search Engines & Netiquette :** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Week 10 - Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Week 11- Task 5: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Productivity tools

LaTeX and Word

Week 12 – Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word:

Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the three tasks and features that would be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Task 1 : Using LaTeX and Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Week 13 - Task 2: Creating project abstract Features to be covered:- Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Week 14 - Task 3 : Creating a Newsletter : Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Week 15 - Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Week 16 - Task 2 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting

LaTeX and MS/equivalent (FOSS) tool Power Point

Week 17 - Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Week 18- Task 2: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting – Images, Clip Art, Audio, Video, Objects, Tables and Charts

Week 19 - Task 3: Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing

and preparing power point presentation. Topic covered during this week includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

REFERENCE BOOKS:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Introduction to Computers, Peter Norton, 6/e Mc Graw Hill Publishers.
4. Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education
5. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
7. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)

Outcomes:

- Apply knowledge for computer assembling and software installation.
- Ability how to solve the trouble shooting problems.
- Apply the tools for preparation of PPT, Documentation and budget sheet etc.

ENGINEERING WORKSHOP

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring
6. Foundry
7. Welding
8. Power tools in construction, wood working, electrical engineering and mechanical Engineering.

2. TRADES FOR DEMONSTRATION & EXPOSURE:

1. Plumbing
2. Machine Shop
3. Metal Cutting (Water Plasma)

TEXT BOOK:

1. Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.
2. Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition

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(A30008) PROBABILITY AND STATISTICS

Objectives: To learn

- Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.
- In the discrete case, study of the binomial and the Poisson random variables and the Normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- Most of the random situations are described as functions of many single random variables. In this unit, the objective is to learn functions of many random variables through joint distributions.
- The types of sampling, Sampling distribution of means,Sampling distribution of variance,Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.
- The mechanism of queuing system ,The characteristics of queue,The mean arrival and service rates
- The expected queue length, The waiting line
- The random processes, The classification of random processes, Markov chain, Classification of states
- Stochastic matrix (transition probability matrix),Limiting probabilities, Applications of Markov chains

UNIT-I

Single Random variables and probability distributions: Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution . Mathematical Expectation, Moment about origin, Central moments Moment generating function of probability distribution.

Binomial, Poisson & normal distributions and their properties. Moment generating functions of the above three distributions, and hence finding the mean and variance.

UNIT-II

Multiple Random variables, Correlation & Regression: Joint probability distributions- Joint probability mass / density function, Marginal probability

mass / density functions, Covariance of two random variables, Correlation - Coefficient of correlation, The rank correlation.

Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

UNIT-III

Sampling Distributions and Testing of Hypothesis

Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and varience, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of varience.

Parameter estimations – likelihood estimate, interval estimations.

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, two sided test,

Large sample tests:

(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known varience & unknown varience, equal and unequal variances)

(ii) Tests of significance of difference between sample S.D and population S.D.

(iii) Tests of significance difference between sample proportion and population proportion&difference between two sample proportions.

Small sample tests:

Student t-distribution,its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples

Snedecor's F- distribution and it's properties. Test of equality of two population variences

Chi-square distribution , it's properties, Chi-square test of goodness of fit

UNIT-IV

Queuing Theory: Structure of a queuing system, Operating Characteristics of queuing system, Transient and steady states, Terminology of Queuing systems, Arrival and service processes- Pure Birth-Death process Deterministic queuing models- M/M/1 Model of infinite queue, M/M/1 model of finite queue .

UNIT-V

Stochastic processes: Introduction to Stochastic Processes –Classification of Random processes, Methods of description of random processes,

Stationary and non-stationary random process, Average values of single random process and two or more random processes. Markov process, Markov chain, classification of states – Examples of Markov Chains, Stochastic Matrix.

TEXT BOOKS:

1) Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers

2) Probability and Statistics for Engineers and Scientists by Sheldon M.Ross, Academic Press

3) Operations Research by S.D. Sarma,

REFERENCE BOOKS:

1. Mathematics for Engineers by K.B.Datta and M.A S.Srinivas,Cengage Publications

2. Probability and Statistics by T.K.V.Iyengar & B.Krishna Gandhi Et

3. Fundamentals of Mathematical Statistics by S C Gupta and V.K.Kapoor

4. Probability and Statistics for Engineers and Scientists by Jay l.Devore.

Outcomes:

- Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuit as well as non-circuit branches of engineering. Also able to differentiate among many random variable involved in the probability models. It is quite useful for all branches of engineering.
- The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations .It is Mainly useful for non-circuit branches of engineering.
- The students would be able to find the expected queue length, the ideal time, the traffic intensity and the waiting time. These are very useful tools in many engineering and data management problems in the industry. It is useful for all branches of engineering.
- The student would able to understand about the random process, Markov process and Markov chains which are essentially models of many time dependent processes such as signals in communications, time series analysis, queuing systems. The student would be able to find the limiting probabilities and the probabilities in nth state. It is quite useful for all branches of engineering

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(A30504) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Objectives:

- To explain with examples the basic terminology of functions, relations, and sets.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To describe the importance and limitations of predicate logic.
- To relate the ideas of mathematical induction to recursion and recursively defined structures.
- To use Graph Theory for solving problems.

UNIT-I

Mathematical Logic : Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Predicates : Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-II

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties, Algebraic structures : Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT-III

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

UNIT-IV

Recurrence Relation : Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics

roots solution of In homogeneous Recurrence Relation.

UNIT-V

Graph Theory : Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs. Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS :

1. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.

REFERENCE BOOKS :

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
2. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.
3. Discrete Mathematics with Applications, Thomas Koshy, Elsevier.
4. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.

Outcomes:

- Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
- Ability to represent and Apply Graph theory in solving computer science problems.

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II Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A30502) DATA STRUCTURES

Objectives:

- To understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data structures.
- To understand the notations used to analyze the Performance of algorithms.
- To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose the appropriate data structure for a specified application.
- To understand and analyze various searching and sorting algorithms.
- To write programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables, search trees.

UNIT- I

Basic concepts- Algorithm Specification-Introduction, Recursive algorithms, Data Abstraction Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations, Introduction to Linear and Non Linear data structures.

Singly Linked Lists-Operations-Insertion, Deletion, Concatenating singly linked lists, Circularly linked lists-Operations for Circularly linked lists, Doubly Linked Lists- Operations- Insertion, Deletion.

Representation of single, two dimensional arrays, sparse matrices-array and linked representations.

UNIT- II

Stack ADT, definition, operations, array and linked implementations in C, applications-infix to postfix conversion, Postfix expression evaluation, recursion implementation, Queue ADT, definition and operations ,array and linked Implementations in C, Circular queues-Insertion and deletion operations, Deque (Double ended queue)ADT, array and linked implementations in C.

UNIT- III

Trees – Terminology, Representation of Trees, Binary tree ADT, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals, Threaded binary trees, Max Priority Queue ADT-implementation-Max Heap-Definition, Insertion into a Max Heap,

Deletion from a Max Heap.

Graphs – Introduction, Definition, Terminology, Graph ADT, Graph Representations- Adjacency matrix, Adjacency lists, Graph traversals- DFS and BFS.

UNIT- IV

Searching- Linear Search, Binary Search, Static Hashing-Introduction, hash tables, hash functions, Overflow Handling.

Sorting-Insertion Sort, Selection Sort, Radix Sort, Quick sort, Heap Sort, Comparison of Sorting methods.

UNIT- V

Search Trees-Binary Search Trees, Definition, Operations- Searching, Insertion and Deletion, AVL Trees-Definition and Examples, Insertion into an AVL Tree ,B-Trees, Definition, B-Tree of order m, operations-Insertion and Searching, Introduction to Red-Black and Splay Trees(Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

Pattern matching algorithm- The Knuth-Morris-Pratt algorithm, Tries (examples only).

TEXT BOOKS:

1. Fundamentals of Data structures in C, 2nd Edition, E.Horowitz, S.Sahni and Susan Anderson-Freed, Universities Press.
2. Data structures A Programming Approach with C, D.S.Kushwaha and A.K.Misra, PHI.

REFERENCE BOOKS:

1. Data structures: A Pseudocode Approach with C, 2nd edition, R.F.Gilberg And B.A.Forouzan, Cengage Learning.
2. Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.
3. Data Structures using C, A.M.Tanenbaum,Y. Langsam, M.J.Augenstein, Pearson.
4. Data structures and Program Design in C, 2nd edition, R.Kruse, C.L.Tondo and B.Leung,Pearson.
5. Data Structures and Algorithms made easy in JAVA, 2nd Edition, Narsimha Karumanchi, CareerMonk Publications.
6. Data Structures using C, R.Thareja, Oxford University Press.
7. Data Structures, S.Lipscutz,Schaum's Outlines, TMH.
8. Data structures using C, A.K.Sharma, 2nd edition, Pearson..
9. Data Structures using C &C++, R.Shukla, Wiley India.
10. Classic Data Structures, D.Samanta, 2nd edition, PHI.

11. Advanced Data structures, Peter Brass, Cambridge.

Outcomes:

- Learn how to use data structure concepts for realistic problems.
- Ability to identify appropriate data structure for solving computing problems in respective language.
- Ability to solve problems independently and think critically.

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II Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A30401) DIGITAL LOGIC DESIGN

Objectives:

- To understand basic number systems codes and logical gates.
- To understand the Boolean algebra and minimization logic.
- To understand the design of combinational sequential circuits.
- To understand the basic s of various memory.

UNIT-I

Digital Systems: Binary Numbers, Octal, Hexa Decimal and other base numbers, Number base conversions, complements, signed binary numbers, Floating point number representation, binary codes, error detecting and correcting codes, digital logic gates(AND, NAND,OR,NOR, Ex-OR, Ex-NOR), Boolean algebra , basic theorems and properties, Boolean functions, canonical and standard forms.

UNIT-II

Gate –Level Minimization and combination circuits, The K-Maps Methods, Three Variable, Four Variable, Five Variable , sum of products, product of sums Simplification, Don't care conditions , NAND and NOR implementation and other two level implantation.

UNIT-III

Combinational Circuits (CC): Design Procedure, Combinational circuit for different code converters and other problems, Binary Adder, subtractor, Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, De-multiplexers.

UNIT-IV

Synchronous Sequential Circuits: Latches, Flip-flops, analysis of clocked sequential circuits, design of counters, Up-down counters, Ripple counters , Registers, Shift registers, Synchronous Counters.

Asynchronous Sequential Circuits: Reduction of state and follow tables, Role free Conditions.

UNIT-V:

Memory: Random Access memory, types of ROM, Memory decoding, address and data bus, Sequential Memory, Cache Memory, Programmable Logic Arrays, memory Hierarchy in terms of capacity and access time.

TEXT BOOK:

1) Digital Design- M. Morris Mano.

REFERENCE BOOKS:

1) Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.

2) Switching and Logic Design, C.V.S. Rao, Pearson Education.

3) Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition.

4) Fundamentals of Digital Logic & Micro Computer Design , 5TH Edition, M. Rafiquzzaman John Wiley.

Outcomes:

After this course student could able to design, understand the number systems, combinational sequential circuits. And they should be in a position to continue with computer organization.

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	4	**-/-/-**	**4**

(A30404) ELECTRONIC DEVICES AND CIRCUITS

Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

- To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET amplifier circuits, transistors and field effect transistors.
- To understand diode as rectifier.
- To study basic principle of filter circuits and various types.

UNIT -I

P-N Junction Diode: Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

Special Purpose Electronic Devices: Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode, SCR and Semiconductor Photo Diode.

UNIT -II

Rectifiers and Filters : The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, p- Section Filters, Comparision of Filters, Voltage Regulation using Zener Diode.

UNIT -III

Bipolar Junction Transistor and UJT: The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation , BJT Specifications, BJT Hybrid Model, Determination of h-parameters from Transistor Characteristics, Comparison of CB, CE, and CC Amplifier Configurations, UJT and Characteristics.

UNIT -IV

Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias,

Bias Stability, Stabilization Factors, Stabilization against variations in VBE and ß, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability, Analysis of a Transistor Amplifier Circuit using h-Parameters.

UNIT -V

Field Effect Transistor and FET Amplifiers

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

FET Amplifiers: FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT and FET.

TEXT BOOKS:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit, 2 Ed.,1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learing, 2013
3. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford.

REFERENCE BOOKS:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits – B. P. Singh, Rekha Singh, Pearson, 2 Ed, 2013.
4. Electronic Devices and Circuits --K. Lal Kishore, 2 Ed., 2005, BSP.
5. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt. Ltd.
6. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

Outcomes:

- Understand and Analyse the different types of diodes, operation and its characteristics.
- Design and analyse the DC bias circuitry of BJT and FET.
- Design biasing circuits using diodes and transistors.
- To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

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II Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A30202) BASIC ELECTRICAL ENGINEERING

Objectives:

This course introduces the concepts of basic electrical engineering parameters, quantities, analysis of AC and DC circuits, the construction operation and analysis of transformers, DC and AC machines. It also gives knowledge about measuring instruments operation in detail.

UNIT – I

Introduction to Electrical Engineering: Ohm's law, basic circuit components, Kirchhoff's laws. Simple problems.

Network Analysis: Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, and series parallel circuits, star delta and delta star transformation. , Network theorems-Superposition, Thevenins's, Maximum power transfer theorems and simple problems.

UNIT-II

Alternating Quantities: Principle of ac voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits.

UNIT-III

Transformers : Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems).

UNIT-IV

D.C. and A.C. Machines:

D.C generators: Principle of operation of dc machines, types of D.C generators, EMF equation in D.C generator. **D.C motors:** Principle of operation of dc motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C generator. **A.C Machines:** Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple problems).

UNIT V

Basic Instruments: Introduction, classification of instruments, operating

principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters and Voltmeters (elementary Treatment only).

TEXT BOOKS:

1. Basic concepts of Electrical Engineering, PS Subramanyam, BS Publications.
2. Basic Electrical Engineering, S.N. Singh, PHI.

REFERENCE BOOKS:

1. Basic Electrical Engineering, Abhijit Chakrabarthi, Sudipta nath, Chandrakumar Chanda, Tata-McGraw-Hill.
2. Principles of Electrical Engineering, V.K Mehta, Rohit Mehta, S.Chand Publications.
3. Basic Electrical Engineering, T.K.Nagasarkar and M.S. Sukhija, Oxford University Press.
4. Fundamentals of Electrical Engineering, RajendraPrasad, PHI.
5. Basic Electrical Engineering by D.P.Kothari , I.J. Nagrath, McGraw-Hill.

Outcomes:

After going through this course the student gets a thorough knowledge on basic electrical circuits, parameters, and operation of the transformers in the energy conversion process, electromechanical energy conversion, construction operation characteristics of DC and AC machines and the constructional features and operation of operation measuring instruments like voltmeter, ammeter, wattmeter etc...With which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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	-	**-/3/-**	**2**

(A30282) ELECTRICAL AND ELECTRONICS LAB

PART - A

1. Verification of Superposition and Reciprocity theorems.
2. Verification of Maximum power transfer theorem.
3. Verification of Thevenin's and Norton's theorems.
4. Magnetization characteristics of D.C. Shunt generator.
5. Swinburne's Test on DC shunt machine.
6. Brake test on DC shunt motor.
7. OC and SC tests on Single-phase transformer.
8. Brake test on 3-phase Induction motor.

PART - B

1. PN Junction Diode Characteristics (Forward bias, Reverse bias).
2. Zener Diode Characteristics.
3. Transistor CE Characteristics (Input and Output).
4. Rectifier without Filters (Full wave & Half wave).
5. Rectifier with Filters (Full wave & Half wave).

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II Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(A30582) DATA STRUCTURES LAB

Objectives:

- To write and execute programs in C to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.
- To write and execute write programs in C to implement various sorting and searching methods.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
- C compiler.

Week1:

Write a C program that uses functions to perform the following:

a) Create a singly linked list of integers.

b) Delete a given integer from the above linked list.

c) Display the contents of the above list after deletion.

Week2:

Write a C program that uses functions to perform the following:

a) Create a doubly linked list of integers.

b) Delete a given integer from the above doubly linked list.

c) Display the contents of the above list after deletion.

Week3:

Write a C program that uses stack operations to convert a given infix expression into its postfix Equivalent, Implement the stack using an array.

Week 4:

Write C programs to implement a double ended queue ADT using i)array and ii)doubly linked list respectively.

Week 5 :

Write a C program that uses functions to perform the following:

a) Create a binary search tree of characters.

b) Traverse the above Binary search tree recursively in Postorder.

Week 6 :

Write a C program that uses functions to perform the following:

a) Create a binary search tree of integers.

b) Traverse the above Binary search tree non recursively in inorder.

Week 7:

Write C programs for implementing the following sorting methods to arrange a list of integers in Ascending order :

a) Insertion sort b) Merge sort

Week 8 :

Write C programs for implementing the following sorting methods to arrange a list of integers in ascending order:

a) Quick sort b) Selection sort

Week 9:

i) Write a C program to perform the following operation:

a)Insertion into a B-tree.

ii) Write a C program for implementing Heap sort algorithm for sorting a given list of integers in ascending order.

Week 10:

Write a C program to implement all the functions of a dictionary (ADT) using hashing.

Week 11:

Write a C program for implementing Knuth-Morris- Pratt pattern matching algorithm.

Week 12:

Write C programs for implementing the following graph traversal algorithms:

a)Depth first traversal b)Breadth first traversal

TEXT BOOKS:

1. C and Data Structures, Third Edition, P.Padmanabham, BS Publications.
2. C and Data Structures, Prof. P.S.Deshpande and Prof. O.G. Kakde, Dreamtech Press.
3. Data structures using C, A.K.Sharma, 2nd edition, Pearson.
4. Data Structures using C, R.Thareja, Oxford University Press.
5. C and Data Structures, N.B.Venkateswarlu and E.V.Prasad,S.Chand.

6. C Programming and Data Structures, P.Radha Krishna, Hi-Tech Publishers.

Outcomes:

- Ability to identify the appropriate data structure for given problem.
- Graduate able to design and analyze the time and space complexity of algorithm or program.
- Ability to effectively use compilers includes library functions, debuggers and trouble shooting.

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A40506) COMPUTER ORGANIZATION

Objectives:

- To understand basic components of computers.
- To explore the I/O organizations in depth.
- To explore the memory organization.
- To understand the basic chip design and organization of 8086 with assembly language programming.

UNIT-I

Basic Computer Organization – Functions of CPU, I/O Units, Memory: Instruction: Instruction Formats- One address, two addresses, zero addresses and three addresses and comparison; addressing modes with numeric examples: Program Control- Status bit conditions, conditional branch instructions, Program Interrupts: Types of Interrupts.

UNIT-II

Input-Output Organizations- I/O Interface, I/O Bus and Interface modules: I/O Vs memory Bus, Isolated Vs Memory-Mapped I/O, Asynchronous data Transfer- Strobe Control, Hand Shaking: Asynchronous Serial transfer- Asynchronous Communication interface, Modes of transfer-Programmed I/O, Interrupt Initiated I/O,DMA; DMA Controller, DMA Transfer, IOP-CPU-IOP Communication, Intel 8089 IOP.

UNIT-III

Memory Organizations

Memory hierarchy, Main Memory, RAM, ROM Chips, Memory Address Map, Memory Connection to CPU, associate memory , Cache Memory, Data Cache, Instruction cache, Miss and Hit ratio, Access time, associative, set associative, mapping , waiting into cache, Introduction to virtual memory.

UNIT-IV

8086 CPU Pin Diagram- Special functions of general purpose registers, Segment register, concept of pipelining, 8086 Flag register, Addressing modes of 8086.

UNIT-V

8086-Instruction formats: assembly Language Programs involving branch & Call instructions, sorting, evaluation of arithmetic expressions.

TEXT BOOKS:

1) Computer system Architecture: Morris Mano (UNIT-1,2,3).
2) Advanced Micro Processor and Peripherals- Hall/ A K Ray(UNIT-4,5).

REFERENCE BOOKS:

1) Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
2) Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson.
3) Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4) Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier.
5) Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

Outcomes:

After this course students understand in a better way the I/O and memory organization in depth. They should be in a position to write assembly language programs for various applications.

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A40507) DATABASE MANAGEMENT SYSTEMS

Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- To understand the relational database design principles.
- To become familiar with the basic issues of transaction processing and concurrency control.
- To become familiar with database storage structures and access techniques.

UNIT- I

Introduction-Database System Applications, Purpose of Database Systems, View of Data – Data Abstraction, Instances and Schemas, Data Models, Database Languages – DDL, DML, Database Access from Application Programs, Transaction Management, Data Storage and Querying, Database Architecture, Database Users and Administrators, History of Data base Systems.

Introduction to Data base design, ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. Relational Model: Introduction to the Relational Model – Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views – Destroying /altering Tables and Views.

UNIT- II

Relational Algebra and Calculus: Relational Algebra – Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

Form of Basic SQL Query – Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set – Comparison Operators, Aggregate Operators, NULL values – Comparison using Null values – Logical connectives – AND, OR and NOT – Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT- III

Introduction to Schema Refinement – Problems Caused by redundancy, Decompositions – Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms – FIRST, SECOND, THIRD Normal forms – BCNF –Properties of Decompositions- Loss less-join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form, Join Dependencies, FIFTH Normal form, Inclusion Dependencies.

UNIT- IV

Transaction Management-Transaction Concept- Transaction State-Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability.

Concurrency Control- Lock –Based Protocols – Timestamp Based Protocols-Validation- Based Protocols – Multiple Granularity.

Recovery System-Failure Classification-Storage Structure-Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT- V

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing – Clustered Indexes, Primary and Secondary Indexes, Index data Structures – Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.

Tree Structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TMH, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw hill, VI edition, 2006.

REFERENCE BOOKS:

1. Database Systems, 6th edition, Ramez Elmasri, Shamkant B.Navathe, Pearson Education, 2013.
2. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil, 2nd ed., ELSEVIER.

3. Database Systems, A Practical approach to Design Implementation and Management Fourth edition, Thomas Connolly, Carolyn Begg, Pearson education.
4. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
5. Fundamentals of Relational Database Management Systems, S.Sumathi, S.Esakkirajan, Springer.
6. Database Management System Oracle SQL and PL/SQL, P.K.Das Gupta, PHI.
7. Introduction to Database Management, M.L.Gillenson and others, Wiley Student Edition.
8. Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group.
9. Introduction to Database Systems, C.J.Date, Pearson Education.
10. Database Management Systems, G.K.Gupta, TMH.

Outcomes:

- Demonstrate the basic elements of a relational database management system.
- Ability to identify the data models for relevant problems.
- Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data.
- Apply normalization for the development of application software's.

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(A40503) JAVA PROGRAMMING

Objectives:

- To understand object oriented programming concepts, and apply them in problem solving.
- To learn the basics of java Console and GUI based programming.

UNIT- I

OOP concepts – Data abstraction, encapsulation, inheritance, benefits of inheritance, polymorphism, classes and objects, Procedural and object oriented programming paradigms

Java programming - History of Java, comments, data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, enumerated types, control flow - block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class.

UNIT- II

Inheritance - Inheritance hierarchies, super and sub classes, Member access rules, super keyword, preventing inheritance: final classes and methods, the Object class and its methods

Polymorphism- dynamic binding, method overriding, abstract classes and methods.

Interfaces – Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Inner classes – Uses of inner classes, local inner classes, anonymous inner classes, static inner classes, examples.

Packages-Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

UNIT- III

Exception handling – Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating

own exception sub classes.

Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern.

UNIT- IV

Collection Framework in Java – Introduction to Java Collections, Overview of Java Collection frame work, Generics, Commonly used Collection classes– Array List, Vector, Hash table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, calendar and Properties

Files – streams- byte streams, character streams, text Input/output, binary input/output, random access file operations, File management using File class.

Connecting to Database - JDBC Type 1 to 4 drivers, connecting to a database, querying a database and processing the results, updating data with JDBC.

UNIT- V

GUI Programming with Java - The AWT class hierarchy, Introduction to Swing, Swing vs. AWT, Hierarchy for Swing components, Containers – JFrame, JApplet, JDialog, JPanel, Overview of some swing components- Jbutton, JLabel, JTextField, JTextArea, simple swing applications, Layout management - Layout manager types – border, grid and flow

Event handling - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: handling a button click, handling mouse events, Adapter classes.

Applets – Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet, passing parameters to applets, applet security issues.

TEXT BOOK:

1. Java Fundamentals – A comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

REFERENCE BOOKS:

1. Java for Programmers, P.J.Deitel and H.M.Deitel, Pearson education (OR) Java: How to Program P.J.Deitel and H.M.Deitel, PHI.
2. Object Oriented Programming through Java, P.Radha Krishna, Universities Press.
3. Thinking in Java, Bruce Eckel, Pearson Education
4. Programming in Java, S.Malhotra and S.Choudhary, Oxford Univ. Press.

Outcomes:

- Understanding of OOP concepts and basics of java programming (Console and GUI based).
- The skills to apply OOP and Java programming in problem solving.
- Should have the ability to extend his/her knowledge of Java programming further on his/her own.

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A40009) ENVIRONMENTAL STUDIES

Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding of environmental policies and regulations

UNIT-I :

Ecosystems: Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II:

Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III:

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and

characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary, Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Problems And Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

UNIT-V:

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:** Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

SUGGESTED TEXT BOOKS:

1 Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

2 Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.

2. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.

3. Environmental Science by Daniel B.Botkin & Edward A.Keller, Wiley INDIA edition.

4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.

5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

Outcomes:

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which inturn helps in sustainable development.

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
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(A40509) FORMAL LANGUAGES AND AUTOMATA THEORY

Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

UNIT- I

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers. **Finite Automata :** NFA with e transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without e-transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT-II

Regular Languages : Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required) **Grammar Formalism :** Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

UNIT- III

Context Free Grammars : Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).**Push Down Automata :** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT- IV

Turing Machine : Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required). linear bounded automata and context sensitive language.

UNIT- V

Computability Theory : Chomsky hierarchy of languages, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

TEXT BOOKS :

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education.
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson.

REFERENCE BOOKS :

1. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan Rama R.
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
3. Theory Of Computation: A Problem-Solving Approach, Kavi Mahesh, Wiley India Pvt. Ltd.
4. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
5. Theory of Computer Science – Automata languages and computation -Mishra and Chandrashekaran, 2nd edition, PHI.

Outcomes:

- Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
- Attains the knowledge of language classes & grammars relationship among them with the help of Chomsky hierarchy.
- Graduate will be able to understanding the pre-requisites to the course compiler or advanced compiler design.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A40508) DESIGN AND ANALYSIS OF ALGORITHMS

Objectives:

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.
- Prerequisites (Subjects) Data structures, Mathematical foundations of computer science.

UNIT- I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized complexity.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's Matrix Multiplication.

UNIT- II

Searching and Traversal Techniques: Efficient non-recursive binary tree traversal algorithms, Disjoint set operations, union and find algorithms, Spanning trees, Graph traversals- Breadth first search and Depth first search, AND/OR graphs, game trees, Connected Components, Bi-connected components.

UNIT- III

Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

Dynamic Programming: General method, applications-Multistage graphs, Optimal binary search trees,0/1 knapsack problem, All pairs shortest path problem, Traveling sales person problem, Reliability design.

UNIT- IV

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Traveling sales person problem,0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT- V

NP-Hard and NP-Complete problems: Basic concepts, Non-deterministic algorithms, NP - Hard and NP- Complete classes, NP-Hard problems, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Satraj Sahni and S.Rajasekharan, Universities Press, 2008.
2. Foundations of Algorithms, 4th edition, R.Neapolitan and K.Naimipour, Jones and Bartlett Learning.
3. Design and Analysis of Algorithms, P.H.Dave, H.B.Dave, Pearson Education, 2008.

REFERENCE BOOKS:

1. Computer Algorithms, Introduction to Design and Analysis, 3rd Edition, Sara Baase, Allen, Van, Gelder, Pearson Education.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia, John Wiley and sons.
3. Fundamentals of Sequential and Parallel Algorithms, K.A.Berman and J.L.Paul, Cengage Learning.
4. Introduction to the Design and Analysis of Algorithms, A.Levitin, Pearson Education.
5. Introduction to Algorithms,3rd Edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt.Ltd.
6. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education,2004.

Outcomes:

- Be able to analyze algorithms and improve the efficiency of algorithms.
- Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc.
- Ability to understand and estimate the performance of algorithm.

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(A40585) JAVA PROGRAMMING LAB

Objectives:

To introduce java compiler and eclipse platform.

To impart hand on experience with java programming.

Note:

1. Use Linux and MySQL for the Lab Experiments. Though not mandatory, encourage the use of Eclipse platform.
2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed.

1) Use Eclipse or Netbean platform and acquaint with the various menus. Create a test project, add a test class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

2) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.

3a) Develop an applet in Java that displays a simple message.

b) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

4) Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box.

5) Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

6) Write a Java program that connects to a database using JDBC and

does add, delete, modify and retrieve operations.

7) Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “Stop” or “Ready” or “Go” should appear above the buttons in selected color. Initially, there is no message shown.

8) Write a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea () that prints the area of the given shape.

9) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.

10) Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).

11) Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).

12) Implement the above program with database instead of a text file.

13) Write a Java program that takes tab separated data (one record per line) from a text file and inserts them into a database.

14) Write a java program that prints the meta-data of a given table

TEXT BOOK:

1. Java Fundamentals – A comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

REFERENCE BOOKS:

1. Java for Programmers, P.J.Deitel and H.M.Deitel, Pearson education (OR) Java: How to Program P.J.Deitel and H.M.Deitel, PHI.
2. Object Oriented Programming through Java, P.Radha Krishna, Universities Press.
3. Thinking in Java, Bruce Eckel, Pearson Education.
4. Programming in Java, S.Malhotra and S.Choudhary, Oxford Univ. Press.

Outcomes:

- Basics of java programming, multi-threaded programs and Exception handling.
- The skills to apply OOP in Java programming in problem solving.
- Ability to access data from a DB with Java programs.
- Use of GUI components (Console and GUI based).

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II Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(A40584) DATABASE MANAGEMENT SYSTEMS LAB

Objectives:

This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named “Roadway Travels” whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database “Roadway travels”. Students are expected to use “Mysql” database.

Roadway Travels

"Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations

Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above process involves many steps like 1. Analyzing the problem and identifying the Entities and Relationships, 2. E-R Model 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete “Database System” to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example: Entities:

1. BUS

2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO(Bus Entity)

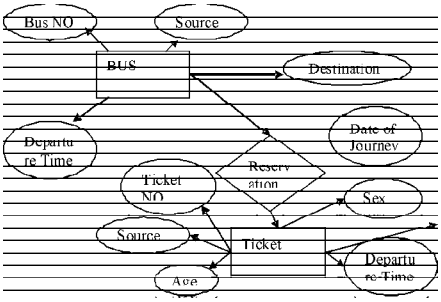
Apart from the above mentioned entities you can identify more. The above mentioned are few.

Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher.

Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Example: E-R diagram for bus



Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example: The passenger tables look as below. This is an example. You can

add more attributes based on your E-R model. This is not a normalized table.

Passenger

Name	Age	Sex	Address	Ticket_id	Passport ID

Note: The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger

Name	Age	Sex	Address	Passport ID

Passport ID	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment 5: Installation of Mysql and practicing DDL commands

Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized “Passenger” table.

```
CREATE TABLE Passenger (
   Passport_id     INTEGER   PRIMARY KEY,
   Name   VARCHAR (50) Not NULL,
   Age     Integer Not NULL,
   Sex   Char,
   Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.

Experiment 6: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

Inserting values into “Bus” table:

```
Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabd','Banglore');
Insert into Bus values (23,'hyderabd','Kolkata');
Insert into Bus values (45,'Tirupathi,'Banglore');
Insert into Bus values (34,'hyderabd','Chennai');
```

Inserting values into “Passenger” table:

```
Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');
Insert into Passenger values (45, 90,'ram', 30,'M','abc12');
Insert into Passenger values (67, 89,'ravi', 50,'M','abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');
```

Few more Examples of DML commands:

Select * from Bus; (selects all the attributes and display)

UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 7: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

Experiment 8 and Experiment 9: Querying (continued…)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.
2. Display the number of days in a week on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.
5. Find the number of tickets booked by a passenger where the number of seats is greater than 1. Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.

Experiment 10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger

```
FOR EACH ROW
BEGIN
 IF NEW.TickentNO > 60 THEN
   SET New.Tickent no = Ticket no;
```

```
    ELSE
        SET New.Ticketno = 0;
    END IF;
   END;
```

Experiment 11: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg:CREATE PROCEDURE myProc()

```
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;
```

Experiment 12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.

Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done

```
CREATE PROCEDURE myProc(in_customer_id INT)
 BEGIN
 DECLARE v_id  INT;
 DECLARE v_name VARCHAR (30);
 DECLARE c1 CURSOR FOR SELECT stdId,stdFirstname FROM students WHERE stdId=in_customer_id;
OPEN c1;
FETCH c1 into v_id, v_name;
Close c1;
END;
```

Tables

BUS

Bus No: Varchar: PK (public key)

Source : Varchar

Destination : Varchar

Passenger

PPNO: Varchar(15)) : PK

Name: Varchar(15)

Age : int (4)

Sex:Char(10) : Male / Female

Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15)) : PK

Ticket_No: Numeric (9)

Reservation

PNR_No: Numeric(9) : FK

Journey_date : datetime(8)

No_of_seats : int (8)

Address : Varchar (50)

Contact_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer

Status: Char (2) : Yes / No

Cancellation

PNR_No: Numeric(9) : FK

Journey_date : datetime(8)

No_of_seats : int (8)

Address : Varchar (50)

Contact_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer

Status: Char (2) : Yes / No

Ticket

Ticket_No: Numeric (9): PK

Journey_date : datetime(8)

Age : int (4)

Sex:Char(10) : Male / Female

Source : Varchar

Destination : Varchar

Dep_time : Varchar

REFERENCE BOOKS:

1. Introduction to SQL, Rick F.Vander Lans, Pearson education.
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearson education.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S.Deshpande, Dream

Tech.

5. Oracle Database 11g PL/SQL Programming, M.Mc Laughlin,TMH.
6. SQL Fundamentals, J.J.Patrick, Pearson Education.

Outcomes:

- Ability to design and implement a database schema for given problem.
- Be capable to Design and build a GUI application.
- Apply the normalization techniques for development of application software to realistic problems.
- Ability to formulate queries using SQL DML/DDL/DCL commands.

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50511) PRINCIPLES OF PROGRAMMING LANGUAGES

Objectives:

- To briefly describe various programming paradigms.
- To provide conceptual understanding of High level language design and implementation.
- To introduce the power of scripting languages.

UNIT- I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT- II

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT-III

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT- IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT,

object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling : Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT- V

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Pragmatics, Key Concepts, Case Study : Python – Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education,2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A.B. Tucker, R.E. Noonan, TMH.
2. Programming Languages, K. C.Louden, 2nd Edition, Thomson, 2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in Prolog, W.F. Clocksin,& C.S.Mellish, 5th Edition, Springer.
5. Programming Python, M.Lutz, 3rd Edition, O'reilly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michael Dawson, Thomson, 2008

Outcomes:

- Ability to express syntax and semantics in formal notation.
- Ability to apply suitable programming paradigm for the application.
- Gain Knowledge and comparison of the features programming languages.

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50018) HUMAN VALUES AND PROFESSIONAL ETHICS

(Open Elective)

Objectives : This introductory course input is intended

a. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

b. To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Value based living in a natural way.

c. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

Unit I:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education. Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration. Continuous Happiness and Prosperity- A look at basic Human Aspirations. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Unit II:

Understanding Harmony in the Human Being - Harmony in Myself! : Understanding human being as a co-existence of the sentient 'I' and the material 'Body'. Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer). Understanding the characteristics and activities of 'I' and harmony in 'I'. Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Swasthya.

Unit III:

Understanding Harmony in the Family and Society- Harmony in Human

- Human Relationship : Understanding harmony in the Family- the basic unit of human interaction. Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; **Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.** Understanding the meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals. Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family!

Unit IV:

Understanding Harmony in the Nature and Existence - Whole existence as Co-existence : Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature. Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

Unit V:

Implications of the above Holistic Understanding of Harmony on Professional Ethics : Natural acceptance of human values. Definitiveness of Ethical Human Conduct. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order,

b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

Case studies of typical holistic technologies, management models and production systems. Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

TEXT BOOKS

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in

Human Values and Professional Ethics.

2. Prof. KV Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications,3rd Edition.

REFERENCE BOOKS

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
6. A.N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethichs (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyofstuff.com
3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charlie Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology – the Untold Story

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50017) INTELLECTUAL PROPERTY RIGHTS

(Open Elective)

UNIT – I

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

Trade Marks : Purpose and function of trade marks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT – III

Law of copy rights : Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

Law of patents : Foundation of patent law, patent searching process, ownership rights and transfer

UNIT – IV

Trade Secrets : Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair competition : Misappropriation right of publicity, False advertising.

UNIT – V

New development of intellectual property: new developments in trade mark law ; copy right law, patent law, intellectual property audits.

International overview on intellectual property, international – trade mark law, copy right law, international patent law, international development in trade secrets law.

TEXT BOOKS & REFERENCES:

1. Intellectual property right, Deborah. E. Bouchoux, cengage learing.
2. Intellectual property right – Unleashing the knowledge economy, prabuddha ganguli, Tate Mc Graw Hill Publishing company ltd.,

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50117) DISASTER MANAGEMENT

(Open Elective)

Unit-I

Environmental Hazards & Disasters: Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach - Ecosystem Approach - Perception approach - Human ecology & its application in geographical researches.

Unit –II

Types of Environmental hazards & Disasters: Natural hazards and Disasters - Man induced hazards & Disasters - Natural Hazards- Planetary Hazards/ Disasters - Extra Planetary Hazards/ disasters - Planetary Hazards-Endogenous Hazards - Exogenous Hazards –

Unit –III

Endogenous Hazards - Volcanic Eruption – Earthquakes – Landslides - Volcanic Hazards/ Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions - Earthquake Hazards/ disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - - Earthquake Hazards in India - - Human adjustment, perception & mitigation of earthquake.

Unit –IV

Exogenous hazards/ disasters - Infrequent events- Cumulative atmospheric hazards/ disasters

Infrequent events: Cyclones – Lightning – Hailstorms

Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes , distribution human adjustment, perception & mitigation) Cumulative atmospheric hazards/ disasters : - Floods- Droughts-Cold waves- Heat waves Floods:- Causes of floods- Flood hazards India-Flood control measures (Human adjustment, perception & mitigation) Droughts:- Impacts of droughts- Drought hazards in India- Drought control measures- Extra Palnetary Hazards/ Disasters- Man induced Hazards / Disasters- Physical hazards/ Disasters-Soil Erosion

Soil Erosion:-- Mechanics & forms of Soil Erosion- Factors & causes of Soil Erosion- Conservation measures of Soil Erosion

Chemical hazards/ disasters:-- Release of toxic chemicals, nuclear explosion- Sedimentation processes Sedimentation processes:- Global Sedimentation problems- Regional Sedimentation problems- Sedimentation & Environmental problems- Corrective measures of Erosion & Sedimentation

Biological hazards/ disasters:- Population Explosion.

Unit –V

Emerging approaches in Disaster Management- Three Stages

1. Pre- disaster stage (preparedness)
2. Emergency Stage
3. Post Disaster stage-Rehabilitation

TEXT BOOKS:

1. Disaster Mitigation: Experiences And Reflections by Pardeep Sahni
2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman – Cengage Learning

REFERENCES

1. R.B.Singh (Ed) Environmental Geography, Heritage Publishers New Delhi,1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawan, 1997
3. Kates,B.I & White, G.F The Environment as Hazards, oxford, New York, 1978
4. R.B. Singh (Ed) Disaster Management, Rawat Publication, New Delhi, 2000
5. H.K. Gupta (Ed) Disaster Management, Universiters Press, India, 2003
6. R.B. Singh, Space Technology for Disaster Mitigation in India (INCED), University of Tokyo, 1994
7. Dr. Satender , Disaster Management t in Hills, Concept Publishing Co., New Delhi, 2003
8. A.S. Arya Action Plan For Earthquake,Disaster, Mitigation in V.K. Sharma (Ed) Disaster Management IIPA Publication New Delhi, 1994
9. R.K. Bhandani An overview on Natural & Man made Disaster & their Reduction,CSIR, New Delhi
10. M.C. Gupta Manuals on Natural Disaster management in India, National Centre for Disaster Management, IIPA, New Delhi, 2001

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50518) SOFTWARE ENGINEERING

Objectives:

- To understanding of software process models such as waterfall and evolutionary models.
- To understanding of software requirements and SRS document.
- To understanding of different software architectural styles.
- To understanding of software testing approaches such as unit testing and integration testing.
- To understanding on quality control and how to ensure good quality software.

UNIT- I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, Specialized process models, The Unified process.

UNIT- II

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT- III

Design 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, mapping data flow into a software architecture.

Modeling component-level design : Designing class-based components, conducting component-level design, Object constraint language, designing conventional components.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT- IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT- V

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering A practitioner's Approach, Roger S Pressman, sixth edition McGrawHill International Edition.
2. Software Engineering, Ian Sommerville, seventh edition, Pearson education.

REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India,2010.
2. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall,PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
7. Software Engineering Foundations, Yingxu Wang, Auerbach

Publications,2008.

8. Software Engineering Principles and Practice, Hans Van Vliet,3rd edition, John Wiley &Sons Ltd.
9. Software Engineering 3:Domains,Requirements,and Software Design, D.Bjorner, Springer International Edition.
10. Introduction to Software Engineering, R.J.Leach, CRC Press.

Outcomes:

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions
- Ability to critically thinking and evaluate assumptions and arguments.

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50514) COMPILER DESIGN

Objectives:

- To describe the steps and algorithms used by language translators.
- To discuss the effectiveness of optimization.
- To explain the machine dependent aspects of Compilation

UNIT – I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – II

Bottom up parsing : Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

UNIT – III

Semantic analysis : Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

Symbol Tables : Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT – IV

Code optimization : Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis : Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT – V

Object code generation : Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS :

1. Principles of compiler design -A.V. Aho . J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

REFERENCE BOOKS :

1. lex &yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler-Cooper & Linda, Elsevier.
4. Compiler Construction, Louden, Thomson.

Outcomes:

- Ability to understand the design of a compiler given features of the languages.
- Ability to implement practical aspects of automata theory.
- Gain Knowledge of powerful compiler generation tools.

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A50510) OPERATING SYSTEMS

Objectives:

- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/output, storage and file management
- To study different OS and compare their features.

UNIT- I

Operating System Introduction: Operating Systems objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special -Purpose Systems, Operating System services, User OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, OS Structure, Virtual Machines.

UNIT- II

Process and CPU Scheduling - Process concepts-The Process, Process State, Process Control Block, Threads, Process Scheduling-Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Thread scheduling, Case studies: Linux, Windows.

Process Coordination – Process Synchronization, The Critical Section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT- III

Memory Management and Virtual Memory - Logical & Physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement Page Replacement Algorithms, Allocation of Frames, Thrashing.

UNIT- IV

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

Mass Storage Structure – Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap space Management

UNIT- V

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

Protection – System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

1. Operating System Principles , Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th Edition, Wiley Student Edition
2. Operating Systems – Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCE BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum, 3rd Edition, PHI
2. Operating Systems A concept-based Approach, 2nd Edition, D.M.Dhamdhere, TMH.
3. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
4. Operating Systems, A.S.Godbole, 2nd Edition, TMH
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, S.Haldar and A.A.Aravind,Pearson Education.
7. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
8. Operating Systems in depth, T.W. Doeppner, Wiley.

Outcomes:

- Apply optimization techniques for the improvement of system performance.
- Ability to understand the synchronous and asynchronous

communication mechanisms in their respective OS.

- Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.
- Ability to compare the different OS

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	4	**-/-/-**	**4**

(A50515) COMPUTER NETWORKS

Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.

UNIT-I

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer – design issues, CRC Codes, Elementary Data link Layer protocols, sliding window protocol

UNIT-II

Multiple Access Protocols –ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters , hubs, bridges , switches, routers and gateways.

UNIT-III

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT-IV

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, Ipv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT-V

The Internet Transport Protocols UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP

Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer-Introduction ,providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH

TEXT BOOKS:

1. Data Communications and Networking – Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks -- Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
4. Computer Networks, L.L.Peterson and B.S.Davie, 4th edition, ELSEVIER.
5. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose,K.W.Ross,3rd Edition, Pearson Education.

Outcomes:

- Students should be understand and explore the basics of Computer Networks and Various Protocols. He/She will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and ad hoc networks.

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(A50589) OPERATING SYSTEMS LAB

Objectives:

- To use inux perating system for study of operating system concepts.
- To write the code to mplement nd odify ariousconcepts in operating systems using Linux.

List of Programs:

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulat all File Organization Techniques
   a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
   a) FIF b) LRU c) LFU Etc.
8. Simulate Paging Technique of memory management.

Outcomes:

- The course objectives ensure the development of students applied skills in operating systems related areas.
- Students willgin knowledge in writing oftware routines odules or mplementing various concepts of perating systems

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III Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(A50587) COMPILER DESIGN LAB

Objectives:

- To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and JDK kit

Consider the following mini Language, a simple procedural high-level language, only operating on integer

data, with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is

defined by the following BNF grammar:

<program> ::= <block>

<block> ::= { <variabledefinition> <slist> }

| { <slist> }

<variabledefinition> ::= int <vardeflist> ;

<vardeflist> ::= <vardec> | <vardec> , <vardeflist>

<vardec> ::= <identifier> | <identifier> [<constant>]

<slist> ::= <statement> | <statement> ; <slist>

<statement> ::= <assignment> | <ifstatement> | <whilestatement>

| <block> | <printstatement> | <empty>

<assignment> ::= <identifier> = <expression>

| <identifier> [<expression>] = <expression>

<ifstatement> ::= if <bexpression> then <slist> else <slist> endif

| if <bexpression> then <slist> endif

<whilestatement> ::= while <bexpression> do <slist> enddo

<printstatement> ::= print (<expression>)

<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>

<bexpression> ::= <expression> <relop> <expression>

<relop> ::= < | <= | == | >= | > | !=

<addingop> ::= + | -

<term> ::= <term> <multop> <factor> | <factor>

<multop> ::= * | /

<factor> ::= <constant> | <identifier> | <identifier> [<expression>]

| (<expression>)

<constant> ::= <digit> | <digit> <constant>

<identifier> ::= <identifier> <letterordigit> | <letter>

<letterordigit> ::= <letter> | <digit>

<letter> ::= a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z

<digit> ::= 0|1|2|3|4|5|6|7|8|9

<empty> has the obvious meaning

Comments (zero or more characters enclosed between the standard C/Java-style comment brackets /

.../) can be inserted. The language has rudimentary support for 1-dimensional arrays. The declaration

int a[3] declares an array of three elements, referenced as a[0], a[1] and a[2]. Note also that you should

worry about the scoping of names.

A simple program written in this language is:

```
{ int a[3],t1,t2;
t1=2;
a[0]=1; a[1]=2; a[t1]=3;
t2=-(a[2]+t1*6)/(a[2]-t1);
if t2>5 then
print(t2);
else {
int t3;
t3=99;
t2=-25;
print(-t1+t2*t3); /* this is a comment
on 2 lines */
} endif }
```

1. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that

identifiers can be arbitrarily long, you may restrict the length to some reasonable value.

2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
3. Design Predictive parser for the given language
4. Design LALR bottom up parser for the above language.
5. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.
6. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code.

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below.

In the description of the individual instructions below, instruction argument types are specified as follows :

R

specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc.).

L

specifies a numerical label (in the range 1 to 9999).

V

specifies a “variable location” (a variable number, or a variable location pointed to by a register - see

below).

A

specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example, an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

LOAD A,R

loads the integer value specified by A into register R.

STORE R,V

stores the value in register R to variable V.

OUT R

outputs the value in register R.

NEG R

negates the value in register R.

ADD A,R

adds the value specified by A to register R, leaving the result in register R.

SUB A,R

subtracts the value specified by A from register R, leaving the result in register R.

MUL A,R

multiplies the value specified by A by register R, leaving the result in register R.

DIV A,R

divides register R by the value specified by A, leaving the result in register R.

JMP L

causes an unconditional jump to the instruction with the label L.

JEQ R,L

jumps to the instruction with the label L if the value in register R is zero.

JNE R,L

jumps to the instruction with the label L if the value in register R is not zero.

JGE R,L

jumps to the instruction with the label L if the value in register R is greater than or equal to zero.

JGT R,L

jumps to the instruction with the label L if the value in register R is greater than zero.

JLE R,L

jumps to the instruction with the label L if the value in register R is less than or equal to zero.

JLT R,L

jumps to the instruction with the label L if the value in register R is less than zero.

NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a STOP instruction.

Outcomes:

- By this laboratory, students will understand the practical approach of how a compiler works.
- This will enable him to work in the development phase of new computer languages in industry.

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	4	**-/-/-**	**4**

(A60521) DISTRIBUTED SYSTEMS

Objectives:

- To understand what and why a distributed system is.
- To understand theoretical concepts, namely, virtual time, agreement and consensus protocols.
- To understand IPC, Group Communication & RPC Concepts.
- To understand the DFS and DSM Concepts.
- To understand the concepts of transaction in distributed environment and associated concepts, namely, concurrency control, deadlocks and error recovery.

UNIT-I

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models, Fundamental Models.

UNIT-II

Time and Global States: Introduction, Clocks Events and Process States, Synchronizing Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging.

Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication, Consensus and Related Problems.

UNIT-III

InterProcess Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in **UNIX.**

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

UNIT-IV

Distributed File Systems: Introduction, File Service Architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

Distributed Shared Memory: Introduction, Design and Implementation Issues, Sequential Consistency and IVY case study, Release Consistency,

Munin Case Study, Other Consistency Models.

UNIT- V

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Control.

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks, Transaction Recovery.

TEXT BOOK:

1) Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tim Kindberg, Pearson Education, 4th Edition, 2009.

REFERENCE BOOKS:

1) Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen, 2nd Edition, PHI.
2) Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC, Taylor & Fransis Group, 2007.

Outcomes:

- Able to comprehend and design a new distributed system with the desired features.
- Able to start literature survey leading to further research in any subarea.
- Able to develop new distributed applications.

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(A60522) INFORMATION SECURITY

Objectives:

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPSec
- Understand Intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls

UNIT – I

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT – II

Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES, Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman, ECC), Key Distribution.

UNIT – III

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm **Authentication Applications:** Kerberos, X.509

Authentication Service, Public – Key Infrastructure, Biometric Authentication

UNIT – IV

E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, key management

UNIT – V

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections

TEXT BOOKS:

1. Cryptography and Network Security : William Stallings, Pearson Education,4th Edition
2. Cryptography and Network Security : Atul Kahate, Mc Graw Hill, 2nd Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Sceurity: WM.Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

Outcomes:

- Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

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(A60524) OBJECT ORIENTED ANALYSIS AND DESIGN

Objectives:

- Concisely define the following key terms: class, object, state, behavior, object class, class diagram, object diagram, operation, encapsulation, constructor operation, query operation, update operation, scope operation, association, association role, multiplicity, association class, abstract class, concrete class, class-scope attribute, abstract operation, method, polymorphism, overriding, multiple classification, aggregation, and composition.
- Describe the activities in the different phases of the object-oriented development life cycle.
- State the advantages of object-oriented modeling vis-à-vis structured approaches.
- Compare and contrast the object-oriented model with the E-R and EER models.
- Model a real-world application by using a UML class diagram.
- Provide a snapshot of the detailed state of a system at a point in time using a UML (Unified Modeling Language) object diagram.
- Recognize when to use generalization, aggregation, and composition relationships.
- Specify different types of business rules in a class diagram.

UNIT- I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT- II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT- III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity

Diagrams.

UNIT- IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT- V

Patterns and Frameworks, Artifact Diagrams. Case Study: The Unified Library application

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML, TMH.
5. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.
6. Object-Oriented Analysis and Design with the Unified Process By John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning.
7. UML and C++, R.C.Lee, and W.M.Tepfenhart, PHI.
8. Object Oriented Analysis, Design and Implementation,B.Dathan, S.Ramnath, Universities Press.
9. OODesign with UML and Java, K.Barclay, J.Savage, Elsevier.
10. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

Outcomes: Graduate can able to take up the case studies and model it in different views with respect user requirement such as use case, logical, component and deployment and etc, and preparation of document of the project for the unified Library application.

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(A60525) SOFTWARE TESTING METHODOLOGIES

Objectives:

To understand the software testing methodologies such as flow graphs and path testing, transaction flows testing, data flow testing, domain testing and logic base testing.

UNIT - I

Introduction:- Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Flow graphs and Path testing:- Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT - II

Transaction Flow Testing:-transaction flows, transaction flow testing techniques.

Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT - III

Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT-IV

Paths, Path products and Regular expressions:- path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing:- overview, decision tables, path expressions, kv charts, specifications.

UNIT - V

State, State Graphs and Transition testing:- state graphs, good & bad state graphs, state testing, Testability tips.

Graph Matrices and Application:-Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

TEXT BOOKS:

1. Software Testing techniques – Boris Beizer, Dreamtech, second

edition.

2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCE BOOKS:

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing,3rd edition,P.C. Jorgensen, Aurbach Publications (Dist.by SPD).
3. Software Testing, N.Chauhan, Oxford University Press.
4. Introduction to Software Testing, P.Ammann&J.Offutt, Cambridge Univ.Press.
5. Effective methods of Software Testing, Perry, John Wiley, 2nd Edition, 1999.
6. Software Testing Concepts and Tools, P.Nageswara Rao, dreamtech Press.
7. Software Testing, M.G.Limaye, TMH.
8. Software Testing, S.Desikan, G.Ramesh, Pearson.
9. Foundations of Software Testing, D.Graham & Others, Cengage Learning.
10. Foundations of Software Testing, A.P.Mathur, Pearson.

Outcomes:

- Ability to apply the process of testing and various methodologies in testing for developed software.
- Ability to write test cases for given software to test it before delivery to the customer.

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(A60010) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Objectives:

To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations namely: demand and supply, production function, cost analysis, markets, forms of business organisations, capital budgeting and financial accounting and financial analysis.

Unit I

Introduction & Demand Analysis*:* Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. *Elasticity of Demand*: Definition, Types, Measurement and Significance of Elasticity of Demand. *Demand Forecasting,* Factors governing demand forecasting, methods of demand forecasting.

Unit II

Production & Cost Analysis: *Production Function* – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. *Cost Analysis***:** Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

Unit III

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. *Pricing*: Objectives and Policies of Pricing. Methods of Pricing. *Business:* Features and evaluation of different forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, *New Economic Environment*: Changing Business Environment in Post-liberalization scenario.

Unit IV

Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Trading Forecast, Capital Budget, Cash Budget. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

Unit V

Introduction to Financial Accounting & Financial Analysis: Accounting concepts and Conventions - Introduction IFRS - Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). *Financial Analysis***:** Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios. Du Pont Chart.

TEXT BOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad 2013.
3. M. Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi, 2012.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
3. Lipsey & Chrystel, Economics, Oxford University Press, 2012
5. Domnick Salvatore: Managerial Economics in a Global Economy, Thomson, 2012.
6. Narayanaswamy: Financial Accounting—A Managerial Perspective, Pearson, 2012.
7. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2012.
8. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.
9. Dwivedi: Managerial Economics, Vikas, 2012.
10. Shailaja & Usha : MEFA, University Press, 2012.
11. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
12. Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage 2011.
13. J. V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers, 2011.

Outcomes:

At the end of the course, the student will

- Understand the market dynamics namely, demand and supply, demand forecasting , elasticity of demand and supply, pricing methods and pricing in different market structures.

- Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis
- Develop an understanding of
- Analyse how capital budgeting decisions are carried out
- Understand the framework for both manual and computerised accounting process
- Know how to analyse and interpret the financial statements through ratio analysis.

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(A60512) WEB TECHNOLOGIES

Objectives:

- To introduce PHP language for server side scripting
- To introduce XML and processing of XML Data with Java
- To introduce Server side programming with Java Servlets and JSP
- To introduce Client side scripting with Javascript and AJAX.

UNIT- I

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories

UNIT- II

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML

Parsing XML Data - DOM and SAX Parsers in java.

UNIT- III

Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT- IV

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

UNIT- V

Client side Scripting: Introduction to Javascript: Javascript language - declaring variables, scope of variables, functions, event handlers (onclick, onsubmit etc.), Document Object Model, Form validation.

Simple AJAX application.

TEXT BOOKS:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill

REFERENCE BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
2. Java Server Pages –Hans Bergsten, SPD O'Reilly
3. Java Script, D.Flanagan, O'Reilly,SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

Outcomes:

- gain knowledge of client side scripting, validation of forms and AJAX programming
- have understanding of server side scripting with PHP language
- have understanding of what is XML and how to parse and use XML Data with Java
- To introduce Server side programming with Java Servlets and JSP

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(A60591) CASE TOOLS and WEB TECHNOLOGIES LAB

CASE TOOLS LAB

Objectives:

- Understand how UML supports the entire OOAD process.
- Become familiar with all phases of OOAD.
- Understand different software testing tools and their features

I. Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she

desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer.

When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

II. Study of any testing tool (e.g. Win runner)

III. Study of any web testing tool (e.g. Selenium)

IV. Study of any bug tracking tool (e.g. Bugzilla, bugbit)

V. Study of any test management tool (e.g. Test Director)

VI. Study of any open source-testing tool (e.g. Test Link)

Outcomes:

Ability to understand the history, cost of using and building CASE tools.

Ability to construct and evaluate hybrid CASE tools by integrating existing tools.

WEB TECHNOLOGIES LAB

Objectives:

- To enable the student to program web applications using the following technologies HTML ,Javascript ,AJAX ,PHP ,Tomcat Server, Servlets ,JSP

Note:

1. Use LAMP Stack (Linux, Apache, MySQL and PHP) for the Lab Experiments. Though not mandatory, encourage the use of Eclipse platform wherever applicable

2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed

1. Install the following on the local machine

- Apache Web Server (if not installed)
- Tomcat Application Server locally
- Install MySQL (if not installed)
- Install PHP and configure it to work with Apache web server and MySQL (if not already configured)

2. Write an HTML page including any required Javascript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.

3. Write an HTML page that has one input, which can take multi-line

text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text entered using an alert message. Words are separated with white space and lines are separated with new line character.

4. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

5. Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b) SAX parser

6. Implement the following web applications using (a) PHP, (b) Servlets and (c) JSP:

i. A user validation web application, where the user submits the login name and password to the server. The name and password are checked against the data already available in Database and if the data matches, a successful login page is returned. Otherwise a failure message is shown to the user.

ii. Modify the above program to use an xml file instead of database.

iii. Modify the above program to use AJAX to show the result on the same page below the submit button.

iv. A simple calculator web application that takes two numbers and an operator (+, -, /, * and %) from an HTML page and returns the result page with the operation performed on the operands.

v. Modify the above program such that it stores each query in a database and checks the database first for the result. If the query is already available in the DB, it returns the value that was previously computed (from DB) or it computes the result and returns it after storing the new query and result in DB.

vi. A web application takes a name as input and on submit it shows a hello <name> page where <name> is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name> message with the duration of usage (hint: Use session to store name and time).

vii. A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with “Hello <name>, you are not authorized to visit this site” message, where <name> should be replaced with the entered name. Otherwise it should send “Welcome <name> to this site” message.

viii. A web application for implementation:

The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions.

If name and password matches, serves a welcome page with user's full name.

If name matches and password doesn't match, then serves "password mismatch" page

If name is not found in the database, serves a registration page, where user's full name is asked and on submitting the full name, it stores, the login name, password and full name in the database (hint: use session for storing the submitted login name and password)

ix. A web application that lists all cookies stored in the browser on clicking "List Cookies" button. Add cookies if necessary.

TEXT BOOKS:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill

REFERENCE BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
2. Java Server Pages –Hans Bergsten, SPD O'Reilly
3. Java Script, D.Flanagan, O'Reilly, SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

Outcomes:

- Use LAMP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs
- Connect to Database and get results
- Parse XML files using Java (DOM and SAX parsers)

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(A60086) ADVANCED COMMUNICATION SKILLS (ACS) LAB

Introduction

The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organise ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

Objectives:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Syllabus:

The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) Lab:

1. **Activities on Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. **Activities on Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
3. **Activities on Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.
4. **Activities on Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.
5. **Activities on Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

Minimum Requirement:

The Advanced Communication Skills (ACS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- **Spacious room with appropriate acoustics.**
- **Round Tables with movable chairs**
- **Audio-visual aids**
- **LCD Projector**
- **Public Address system**
- **P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ**
- **T. V, a digital stereo & Camcorder**
- **Headphones of High quality**

Prescribed Lab Manual: A book titled ***A Course Book of Advanced***

Communication Skills (ACS) Lab published by Universities Press, Hyderabad.

Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed**
  - **Positive Thinking**
  - **Interviewing Skills**
  - **Telephone Skills**
  - **Time Management**

Books Recommended:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.
3. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
4. Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.
5. The Basics of Communication: A Relational Perspective. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
6. English Vocabulary in Use series, Cambridge University Press 2008.
7. Management Shapers Series by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
8. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
9. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.

10. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
11. Job Hunting by Colm Downes, Cambridge University Press 2008.
12. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
13. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.
14. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/ Cambridge University Press.
15. International English for Call Centres by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

***Advanced Communication Skills Lab Practicals**:*

1. The practical examinations for the ACS Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned, by inviting the External Examiner from outside. In case of the non-availability of the External Examiner, other teacher of the same department can act as the External Examiner.

Mini Project: As a part of Internal Evaluation

1. Seminar/ Professional Presentation

2. A Report on the same has to be prepared and presented.

* ***Teachers may use their discretion to choose topics relevant and suitable to the needs of students.***
* ***Not more than two students to work on each mini project.***
* ***Students may be assessed by their performance both in oral presentation and written report.***

Outcomes

- Accomplishment of sound vocabulary and its proper use contextually.
- Flair in Writing and felicity in written expression.
- Enhanced job prospects.
- Effective Speaking Abilities

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A70517) LINUX PROGRAMMING

Objectives:

- To understand and make effective use of Linux utilities and Shell scripting language (bash) to solve Problems.
- To implement in C some standard Linux utilities such as ls,mv,cp etc.using system calls.
- To develop the skills necessary for systems programming including file system programming, process and signal management, and interprocess communication.
- To develop the basic skills required to write network programs using Sockets.

UNIT- I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

Sed-Scripts, Operation, Addresses, Commands, Applications, awk-Execution, Fields and Records, Scripts, Operation, Patterns, Actions, Associative Arrays, String and Mathematical functions, System commands in awk, Applications.

Shell programming with Bourne again shell(bash)- Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT- II

Files and Directories- File Concept, File types, File System Structure,file metadata-Inodes, kernel support for files, system calls for file I/O operations-open, creat, read, write, close, lseek, dup2,file status information-stat family, file and record locking- fcntl function, file permissions - chmod, fchmod,file ownership-chown,lchown, fchown, links-soft links and hard links – symlink, link, unlink.

Directories-Creating, removing and changing Directories-mkdir, rmdir, chdir, obtaining current working directory-getcwd, Directory contents, Scanning Directories-opendir, readdir, closedir, rewinddir functions.

UNIT- III

Process – Process concept, Layout of a C program image in main

memory,Process environment-environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process control - process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family, Process Groups, Sessions and Controlling Terminal, Differences between threads and processes.

Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT- IV

Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions.

Message Queues- Kernel support for messages, APIs for message queues, client/server example.

Semaphores-Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

UNIT- V

Shared Memory- Kernel support for shared memory, APIs for shared memory, shared memory example.

Sockets- Introduction to Berkeley Sockets, IPC over a network, Client-Server model, Socket address structures (Unix domain and Internet domain),Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs-Single Server-Client connection, Multiple simultaneous clients, Socket options-setsockopt and fcntl system calls, Comparison of IPC mechanisms.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Unix Network Programming , W.R.Stevens, PHI.

REFERENCE BOOKS:

1. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.

3. System Programming with C and Unix, A.Hoover, Pearson.
4. Unix System Programming, Communication, Concurrency and Threads, K.A.Robbins and S.Robbins, Pearson Education.
5. Unix shell Programming, S.G.Kochan and P.Wood,3rd edition, Pearson Education.
6. Shell Scripting, S.Parker, Wiley India Pvt. Ltd.
7. Advanced Programming in the Unix Environment,2nd edition, W.R.Stevens and S.A.Rago, Pearson Education.
8. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
9. Linux System Programming, Robert Love, O'Reilly, SPD.
10. C Programming Language, Kernighan and Ritchie, PHI

Outcomes:

- Work confidently in Linux environment.
- Work with shell script to automate different tasks as Linux administration.

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(A70530) DESIGN PATTERNS

Objectives:

- Understand the design patterns that are common in software applications.
- Understand how these patterns are related to Object Oriented design.

UNIT-I

Introduction: What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II

A Case Study: Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-III

Structural Pattern Part-I: Adapter, Bridge, Composite.

Structural Pattern Part-II: Decorator, açade, Flyweight, Proxy.

UNIT-IV

Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter, Iterator.

Behavioral Patterns Part-II: Mediator, Memento, Observer.

UNIT-V

Behavioral Patterns Part-II (cont'd): State, Strategy, Template Method ,Visitor, Discussion of Behavioral Patterns.

What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK:

1. Design Patterns By Erich Gamma, Pearson Education

REFERENCE BOOKS :

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley DreamTech.

2. Pattern's in JAVA Vol-II By Mark Grand, Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand, Wiley DreamTech.
4. Head First Design Patterns By Eric Freeman-Oreilly-spd.
5. Peeling Design Patterns, Prof. Meda Srinivasa Rao, Narsimha Karumanchi, CareerMonk Publications.
6. Design Patterns Explained By Alan Shalloway, Pearson Education.
7. Pattern Oriented Software Architecture, F.Buschmann&others, John Wiley & Sons.

Outcomes:

- Ability to understand and apply common design patterns to incremental / iterative development.
- Ability to identify appropriate patterns for design of given problem.

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(A70520) DATA WAREHOUSING AND DATA MINING

Objectives:

Study data warehouse principles and its working learn data mining concepts understand association rules mining. Discuss classification algorithms learn how data is grouped using clustering techniques.

UNIT-I

Data warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi-Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Consultation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

UNIT-II

Introduction to Data Mining: Introduction**,** What is Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Preprocessing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selection, Discretization and Binaryzation, Data Transformation; Measures of Similarity and Dissimilarity- Basics.

UNIT-III

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT-IV

Classification: Problem Definition, General Approaches to solving a classification problem , Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction , Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction ; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

UNIT-V

Clustering: Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms**,** Partitioning Clustering-K-Means Algorithm, K-Means Additional

issues, PAM Algorithm; Hierarchical Clustering-Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Specific techniques, Key Issues in Hierarchical Clustering, Strengths and Weakness; Outlier Detection.

TEXT BOOKS:

1) Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.

2) Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Education.

REFERENCE BOOKS:

1) Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.

2) Data Warehousing Fundamentals, Pualraj Ponnaiah, Wiley Student Edition.

3) The Data Warehouse Life Cycle Toolkit – Ralph Kimball, Wiley Student Edition.

4) Data Mining, Vikaram Pudi, P Radha Krishna, Oxford University Press

Outcomes:

- Student should be able to understand why the data warehouse in addition to database systems.
- Ability to perform the preprocessing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large data sets.
- Ability to solve real world problems in business and scientific information using data mining

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IV Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
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(A70519) CLOUD COMPUTING

Objectives:

- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.
- To describe the security aspects in cloud.

UNIT- I

Systems Modeling, Clustering and Virtualization: Distributed System Models and Enabling Technologies, Computer Clusters for Scalable Parallel Computing, Virtual Machines and Virtualization of Clusters and Data centers.

UNIT- II

Foundations: Introduction to Cloud Computing, Migrating into a Cloud, Enriching the 'Integration as a Service' Paradigm for the Cloud Era, The Enterprise Cloud Computing Paradigm.

UNIT- III

Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS): Virtual machines provisioning and Migration services, On the Management of Virtual machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a cluster as a Service, Secure Distributed Data Storage in Cloud Computing.

Aneka, Comet Cloud, T-Systems', Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments.

UNIT- IV

Monitoring, Management and Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing, Performance Prediction for HPC on Clouds, Best Practices in Architecting Cloud Applications in the AWS cloud, Building Content Delivery networks using Clouds, Resource Cloud Mashups.

UNIT- V

Governance and Case Studies: Organizational Readiness and Change management in the Cloud age, Data Security in the Cloud, Legal Issues in Cloud computing, Achieving Production Readiness for Cloud Services.

TEXT BOOKS:

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.

2. Distributed and Cloud Computing, Kai Hwang, Geoffery C.Fox, Jack J.Dongarra, Elsevier, 2012.

REFERENCE BOOKS:

1. Cloud Computing : A Practical Approach, Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill, rp2011.
2. Enterprise Cloud Computing, Gautam Shroff, Cambridge University Press, 2010.
3. Cloud Computing: Implementation, Management and Security, John W. Rittinghouse, James F.Ransome, CRC Press, rp2012.
4. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, George Reese, O'Reilly, SPD, rp2011.
5. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011.

Outcomes:

- Ability to understand the virtualization and cloud computing concepts.

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(A70540) SOFTWARE PROJECT MANAGEMENT

(Elective- I)

Objectives:

The main goal of software development projects is to create a software system with a predetermined functionality and quality in a given time frame and with given costs. For achieving this goal, models are required for determining target values and for continuously controlling these values. This course focuses on principles, techniques, methods & tools for model-based management of software projects, assurance of product quality and process adherence (quality assurance), as well as experience-based creation & improvement of models (process management). The goals of the course can be characterized as follows:

1. Understanding the specific roles within a software organization as related to project and process management
2. Understanding the basic infrastructure competences (e.g., process modeling and measurement)
3. Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

UNIT- I

Conventional Software Management: The waterfall model, conventional software

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

UNIT- II

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- III

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.

UNIT- IV

Work Flows of the process: Software process workflows, Inter trans workflows.Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction 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- V

Project Control and Process instrumentation: The server care Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process discriminants, Example.

Future Software Project Management: Modern Project Profiles Next generation

Software economics, modern Process transitions.

Case Study : The Command Center Processing and Display System-Replacement(CCPDS-R).

TEXT BOOKS:

1. Software Project Management, Walker Royce, Pearson Education.
2. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, Tata McGraw Hill.

REFERENCE BOOKS:

1. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006
2. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly,2007
3. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.
4. Agile Project Management, Jim Highsmith, Pearson education, 2004
5. The art of Project management, Scott Berkun, O'Reilly, 2005.
6. Software Project Management in Practice, Pankaj Jalote, Pearson Education,2002.

Outcomes:

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

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IV Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A70532) IMAGE PROCESSING AND PATTERN RECOGNITION

(Elective - I)

Objectives:

- Adequate background knowledge about image processing and pattern recognition
- Practical knowledge and skills about image processing and pattern recognition tools
- Necessary knowledge to design and implement a prototype of an image processing and pattern recognition *application.*

UNIT – I

Fundamental steps of image processing, components of an image processing of system. The image model and image acquisition, sampling and quantization, relationship between pixels, distance functions, scanner.

Statistical and spatial operations, Intensity functions transformations, histogram processing, smoothing & sharpening – spatial filters Frequency domain filters, homomorphic filtering, image filtering & restoration. Inverse and weiner filtering, FIR weiner filter, Filtering using image transforms, smoothing splines and interpolation.

UNIT – II

Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms, extension to grey scale images.

Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and Laplace operators, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersheds.

UNIT –III

Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding, Digital Image Water marking.

UNIT –IV

Representation and Description: Chain codes, Polygonal approximation, Signature Boundary Segments, Skeltons, Boundary Descriptors, Regional Descriptors, Relational Descriptors, Principal components for Description,

Relational Descriptors

UNIT- V

Pattern Recognition Fundamentals: Basic Concepts of pattern recognition, Fundamental problems in pattern recognition system, design concepts and methodologies, example of automatic pattern recognition systems, a simple automatic pattern recognition model

Pattern classification: Pattern classification by distance function: Measures of similarity, Clustering criteria, K-means algorithm, Pattern classification by likelihood function: Pattern classification as a Statistical decision problem, Bayes classifier for normal patterns.

TEXT BOOKS

1. Digital Image Processing Third edition, Pearson Education, Rafael C. Gonzalez, Richard E. Woods.
2. Pattern recognition Principles: Julus T. Tou, and Rafel C. Gonzalez, Addision-Wesly Publishing Company.
3. Digital Image Processing, M.Anji Reddy, Y.Hari Shankar, BS Publications.

REFERENCE BOOKS:

1. Image Processing, Analysis and Machine Vision, Second Edition, Milan Sonka, Vaclav Hlavac and Roger Boyle. Thomson learning
2. Digital Image Processing – William k. Pratl –John Wiley edition.
3. Fundamentals of digital image processing – by A.K. Jain, PHI.
4. Pattern classification, Richard Duda, Hart and David strok John Wiley publishers.
5. Digital Image Processing, S.Jayaraman,S. Esakkirajan, T.Veerakumar, TMH.
6. Pattern Recognition, R.Shinghal, Oxford University Press.

Outcomes:

- Ability to apply computer algorithms to practical problems.
- Ability to image segmentation, reconstruction and restoration.
- Ability to perform the classification of patterns

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IV Year B.Tech. CSE-I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A70536) MOBILE COMPUTING

(Elective – I)

Objectives:

- To make the student understand the concept of mobile computing paradigm, its novel applications and limitations.
- To understand the typical mobile networking infrastructure through a popular GSM protocol
- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
- To understand the database issues in mobile environments & data delivery models.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobile environment.

UNIT- I

Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT –II

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)

Mobile Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT –III

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT- IV

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols

UNIT- V

Mobile Ad hoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing :WAP, Bluetooth, XML, J2ME, JavaCard, PalmOS, Windows CE, SymbianOS, Linux for Mobile Devices, Android.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007, ISBN: 0195686772

REFERENCE BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2004.
2. Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, Oct 2004,

Outcomes:

- Able to think and develop new mobile application.
- Able to take any new technical issue related to this new paradigm and come up with a solution(s).
- Able to develop new ad hoc network applications and/or algorithms/ protocols.
- Able to understand & develop any existing or new protocol related to mobile environment

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	4	**-/-/-**	**4**

(A70529) COMPUTER GRAPHICS

(Elective- I)

Objectives:

- To make students understand about fundamentals of Graphics to enable them to design animated scenes for virtual object creations.
- To make the student present the content graphically.

UNIT- I

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT- II

2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT- III

3**-D Object representation**: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces, sweep representations, octrees BSP Trees,

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT- IV

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

Illumination Models and Surface rendering Methods: Basic illumination

models, polygon rendering methods

UNIT- V

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc Graw hill edition.

REFERENCE BOOKS:

1. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
2. "Procedural elements for Computer Graphics", David F Rogers, Tata Mc Graw hill, 2nd edition.
3. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
4. "Principles of Computer Graphics", Shalini, Govil-Pai, Springer.
5. "Computer Graphics", Steven Harrington, TMH
6. Computer Graphics, F.S.Hill, S.M.Kelley, PHI.
7. Computer Graphics, P.Shirley, Steve Marschner & Others, Cengage Learning.
8. Computer Graphics & Animation, M.C.Trivedi, Jaico Publishing House.
9. An Integrated Introduction to Computer Graphics and Geometric Modelling, R.Goldman, CRC Press, Taylor&Francis Group.
10. Computer Graphics, Rajesh K.Maurya, Wiley India.

Outcomes:

- Students can animate scenes entertainment.
- Will be able work in computer aided design for content presentation..
- Better analogy data with pictorial representation.

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	4	**-/-/-**	**4**

(A70352) OPERATIONS RESEARCH

(Elective-I)

Objectives:

- To introduce the methods of Operations Research.
- Emphasize the mathematical procedures of non linear programming search techniques.
- Introduce advanced topics such as Probabilistic models and dynamic programming.

UNIT – I

Development – Definition– Characteristics and Phases – Types of models – Operations Research models – applications.

Allocation: Linear Programming Problem Formulation – Graphical solution – Simplex method – Artificial variables techniques: Two–phase method, Big-M method.

UNIT – II

Transportation Problem – Formulation – Optimal solution, unbalanced transportation problem – Degeneracy.

Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem- Traveling Salesman problem.

UNIT – III

Sequencing – Introduction – Flow **–**Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines

Replacement: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely- Group Replacement.2

UNIT – IV

Theory of Games: Introduction –Terminology– Solution of games with saddle points and without saddle points- 2 x 2 games – dominance principle – m x 2 & 2 x n games -graphical method.

Inventory: Introduction – Single item, Deterministic models – Purchase inventory models with one price break and multiple price breaks –Stochastic models – demand may be discrete variable or continuous variable – Single Period model and no setup cost.

UNIT – V

Waiting Lines: Introduction – Terminology-Single Channel – Poisson arrivals and Exponential Service times – with infinite population and finite population models– Multichannel – Poisson arrivals and exponential service times with infinite population.

Dynamic Programming: Introduction – Terminology- Bellman's Principle of Optimality – Applications of dynamic programming- shortest path problem – linear programming problem.

Simulation: Introduction, Definition, types of simulation models, Steps involved in the simulation process- Advantages and disadvantages- applications of simulation to queuing and inventory.

TEXT BOOK :

1. Operations Research /J.K.Sharma 4e. /MacMilan
2. Introduction to O.R/Hillier & Libermann/TMH

REFERENCE BOOKS :

1. Introduction to O.R /Taha/PHI
2. Operations Research/ NVS Raju/ SMS Education/3rd Revised Edition
3. Operations Research /A.M.Natarajan, P.Balasubramaniam, A. Tamilarasi/Pearson Education.
4. Operations Research / Wagner/ PHI Publications.
5. Operations Research/M.V. Durga Prasad, K, Vijaya Kumar Reddy, J. Suresh Kumar/ Cengage Learning.

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	4	**-/-/-**	**4**

(A70534) MACHINE LEARNING

(Elective – II)

Objectives:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

UNIT – I

Introduction: An illustrative learning task, and a few approaches to it. What is known from algorithms? Theory, Experiment. Biology. Psychology.

Concept Learning: Version spaces. Inductive Bias. Active queries. Mistake bound/ PAC model. basic results. Overview of issues regarding data sources, success criteria.

UNIT –II

Decision Tree Learning: - Minimum Description Length Principle. Occam's razor. Learning with active queries

Neural Network Learning: Perceptions and gradient descent back propagation.

UNIT –III

Sample Complexity and Over fitting: Errors in estimating means. Cross Validation and jackknifing VC dimension. Irrelevant features: Multiplicative rules for weight tuning.

Bayesian Approaches: The basics Expectation Maximization. Hidden Markov Models

UNIT—IV

Instance-based Techniques: Lazy vs. eager generalization. K nearest neighbor, case- based reasoning.

UNIT—V

Genetic Algorithms: Different search methods for induction - Explanation-based Learning: using prior knowledge to reduce sample complexity.

TEXT BOOKS:

1. Tom Michel, Machine Learning, McGraw Hill, 1997

2. Trevor Has tie, Robert Tibshirani & Jerome Friedman. The Elements of Statically Learning, Springer Verlag, 2001

REFERENCE BOOKS:

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
2. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc.,2001
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

Outcomes:

- Student should be able to understand the basic concepts such as decision trees and neural networks.
- Ability to formulate machine learning techniques to respective problems.
- Apply machine learning algorithms to solve problems of moderate complexity

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	4	**-/-/-**	**4**

(A70539) SOFT COMPUTING

(Elective – II)

Objectives:

- To give students knowledge of soft computing theories fundamentals, i.e. Fundamentals of artificial and neural networks, fuzzy sets and fuzzy logic and genetic algorithms.

UNIT-I

AI Problems and Search: AI problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques- Generate and Test, Hill Climbing, Best First Search Problem reduction, Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation- Using Predicate Logic and Rules.

UNIT-II

Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Backpropagation Network. Associative Memory Networks. Traing Algorithms for pattern association, BAM and Hopfield Networks.

UNIT-III

Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks.

UNIT-IV

Introduction to Classical Sets (crisp Sets)and Fuzzy Sets- operations and Fuzzy sets. Classical Relations -and Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.

Membership functions- Features, Fuzzification, membership value assignments, Defuzzification.

UNIT-V

Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making

Fuzzy Logic Control Systems. Genetic Algorithm- Introduction and basic operators and terminology. Applications: Optimization of TSP, Internet Search Technique

TEXT BOOKS:

1. Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007.
2. Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva, Pearson Edition, 2004.

REFERENCE BOOKS:

1. Artificial Intelligence and SoftComputing- Behavioural and Cognitive Modelling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
3. Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.
4. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5. Artificial Intelligence and Intelligent Systems, N.P.Padhy, Oxford Univ. Press.

Outcomes:

- Student can able to building intelligent systems through soft computing techniques.
- Student should be able to understand the concept of artificial neural networks, fuzzy arithmetic and fuzzy logic with their day to day applications.

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	4	**-/-/-**	**4**

(A70533) INFORMATION RETRIEVAL SYSTEMS

(Elective – II)

Objectives:

- To learn the different models for information storage and retrieval
- To learn about the various retrieval utilities
- To understand indexing and querying in information retrieval systems
- To expose the students to the notions of structured and semi structured data
- To learn about web search

UNIT-I

Introduction

Retrieval Strategies: Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model Language Models.

UNIT-II

Retrieval Utilities: Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri.

UNIT-III

Retrieval Utilities: Semantic networks, Parsing.

Cross-Language Information Retrieval: Introduction, Crossing the language barrier.

UNIT-IV

Efficiency: Inverted index, Query processing, Signature files, Duplicate document detection

UNIT-V

Integrating Structured Data and Text: A Historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema.

Distributed Information Retrieval: A Theoretical model of distributed retrieval, Web search.

TEXT BOOK:

1. David A. Grossman, Ophir Frieder, Information Retrieval – Algorithms and Heuristics, Springer, 2nd Edition (Distributed by Universities Press), 2004.

REFERENCE BOOKS:

1. Gerald J Kowalski, Mark T Maybury. Information Storage and Retrieval Systems, Springer, 2000.
2. Soumen Chakrabarti, Mining the Web : Discovering Knowledge from Hypertext Data, Morgan-Kaufmann Publishers, 2002.
3. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, An Introduction to Information Retrieval, Cambridge University Press, Cambridge, England, 2009.

Outcomes:

- Possess the ability to store and retrieve textual documents using appropriate models.
- Possess the ability to use the various retrieval utilities for improving search.
- Possess an understanding of indexing and compressing documents to improve space and time efficiency.
- Possess the skill to formulate SQL like queries for unstructured data.
- Understand issues in web search.

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	4	**-/-/-**	**4**

(A70526) ARTIFICIAL INTELLIGENCE

(ELECTIVE- II)

Objectives:

- To learn the difference between optimal reasoning vs human like reasoning
- To understand the notions of state space representation, exhaustive search, heuristic search along with the time and space complexities
- To learn different knowledge representation techniques
- To understand the applications of AI: namely Game Playing, Theorem Proving, Expert Systems, Machine Learning and Natural Language Processing

UNIT-I

Introduction, History, Intelligent Systems, Foundations of AI, Sub areas of AI, Applications.

Problem Solving - State-Space Search and Control Strategies: Introduction, General Problem Solving, Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques, Iterative-Deepening A*, Constraint Satisfaction.

Game Playing, Bounded Look-ahead Strategy and use of Evaluation Functions, Alpha-Beta Pruning

UNIT-II

Logic Concepts and Logic Programming: Introduction, Propositional Calculus, Propositional Logic, Natural Deduction System, Axiomatic System, Semantic Tableau System in Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic, Logic Programming.

Knowledge Representation: Introduction, Approaches to Knowledge Representation, Knowledge Representation using Semantic Network, Extended Semantic Networks for KR, Knowledge Representation using Frames.

UNIT-III

Expert System and Applications: Introduction, Phases in Building Expert Systems, Expert System Architecture, Expert Systems Vs Traditional Systems, Truth Maintenance Systems, Application of Expert Systems, List of Shells and Tools.

Uncertainty Measure - Probability Theory: Introduction, Probability Theory, Bayesian Belief Networks, Certainty Factor Theory, Dempster-Shafer Theory.

UNIT-IV

Machine-Learning Paradigms: Introduction. Machine Learning Systems. Supervised and Unsupervised Learning. Inductive Learning. Learning Decision Trees (Text Book 2), Deductive Learning. Clustering, Support Vector Machines.

Artificial Neural Networks: Introduction, Artificial Neural Networks, Single-Layer Feed-Forward Networks, Multi-Layer Feed-Forward Networks, Radial-Basis Function Networks, Design Issues of Artificial Neural Networks, Recurrent Networks.

UNIT-V

Advanced Knowledge Representation Techniques: Case Grammars, Semantic Web

Natural Language Processing: Introduction, Sentence Analysis Phases, Grammars and Parsers, Types of Parsers, Semantic Analysis, Universal Networking Knowledge.

TEXT BOOKS:

1. Saroj Kaushik. Artificial Intelligence. Cengage Learning, 2011.
2. Russell, Norvig: Artificial intelligence, A Modern Approach, Pearson Education, Second Edition. 2004.

REFERENCE BOOK:

1. Rich, Knight, Nair: Artificial intelligence, Tata McGraw Hill, Third Edition 2009.

Outcomes:

- Possess the ability to formulate an efficient problem space for a problem expressed in English.
- Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
- Possess the skill for representing knowledge using the appropriate technique.
- Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing.

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	4	**-/-/-**	**4**

(A70528) COMPUTER FORENSICS

(Elective-II)

Objectives:

- A brief explanation of the objective is to provide digital evidences which are obtained from digital media.
- In order to understand the objectives of computer forensics, first of all, people have to recognize the different roles computer plays in a certain crime.
- According to a snippet from the United States Security Service, the functions computer has in different kinds of crimes.

UNIT – I

Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement – Computer Forensic Technology – Types of Business Computer Forensic Technology

Computer Forensics Evidence and Capture: Data Recovery Defined – Data Back-up and Recovery – The Role of Back-up in Data Recovery – The Data-Recovery Solution

UNIT – II

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options – Obstacles – Types of Evidence – The Rules of Evidence – Volatile Evidence – General Procedure – Collection and Archiving – Methods of Collection – Artifacts – Collection Steps – Controlling Contamination: The Chain of Custody

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collecting and Preserving Computer Forensic Evidence

Computer Image Verification and Authentication: Special Needs of Evidential Authentication – Practical Consideration – Practical Implementation

UNIT – III

Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using

network tools, examining the honeynet project.

Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

UNIT – IV

Current Computer Forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software

E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

UNIT – V

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

TEXT BOOKS:

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
2. Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

REFERENCE BOOKS:

1. Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison- Wesley Pearson Education
2. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
3. Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
5. Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley India Edition.

Outcomes:

- Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
- It gives an opportunity to students to continue their zeal in research in computer forensics.

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	-	**-/3/-**	**2**

(A70596) LINUX PROGRAMMING LAB

Objectives:

- To write shell scripts to solve problems.
- To implement some standard Linux utilities such as ls,cp etc using system calls.
- To develop network-based applications using C.

List of sample problems:

Note: Use Bash for Shell scripts.

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a C program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Linux commands using System calls
    a). cat b) mv
12. Write a C program to list files in a directory.
13. Write a C program to emulate the Unix ls –l command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that redirects standard output to a file.Ex: ls > f1.
16. Write a C program to create a child process and allow the parent to display “parent” and the child to display “child” on the screen.

17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l | sort
20. Write C programs that illustrate communication between two unrelated processes using named pipe(FIFO File).
21. Write a C program in which a parent writes a message to a pipe and the child reads the message.
22. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
23. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (22)) and displays them.
24. Write a C program that illustrates suspending and resuming processes using signals.
25. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Unix Domain sockets to perform the following:
    Client process sends a message to the Server Process.The Server receives the message,reverses it and sends it back to the Client.The Client will then display the message to the standard output device.
26. Write Client and Server programs in C for connection oriented communication between Server and Client processes using Internet Domain sockets to perform the following:
    Client process sends a message to the Server Process.The Server receives the message,reverses it and sends it back to the Client.The Client will then display the message to the standard output device.
27. Write C programs to perform the following:
    One process creates a shared memory segment and writes a message("Hello") into it.Another process opens the shared memory segment and reads the message(ie. "Hello").It will then display the message("Hello") to standard output device.

TEXT BOOKS:

1. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
2. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education.
4. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
5. Sed and Awk, O.Dougherty&A.Robbins,2nd edition, SPD.

Outcomes:

- Ability to understand the Linux environment
- Ability to perform the file management and multiple tasks using shell scripts in Linux environment

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	-	**-/3/-**	**2**

(A70595) DATA WAREHOUSING AND MINING LAB

Objectives:

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.

UNIT-1. Build Data Warehouse and Explore WEKA

A. Build a Data Warehouse/Data Mart (using open source tools like Pentaho Data Integration tool, Pentoaho Business Analytics; or other data warehouse tools like Microsoft-SSIS, Informatica, Business Objects, etc.).

(i). Identify source tables and populate sample data

(ii). Design multi-dimensional data models namely Star, snowflake and Fact constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, Manufacturing, Automobile, etc.).

(iii). Write ETL scripts and implement using data warehouse tools

(iv). Perform various OLAP operations such slice, dice, roll up, drill up and pivot

(v). Explore visualization features of the tool for analysis like identifying trends etc.

B. Explore WEKA Data Mining/Machine Learning Toolkit

(i). Downloading and/or installation of WEKA data mining toolkit,

(ii). Understand the features of WEKA toolkit such as Explorer, Knowledge Flow interface, Experimenter, command-line interface.

(iii). Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, Classify panel, Cluster panel, Associate panel and Visualize panel)

(iv). Study the arff file format

(v). Explore the available data sets in WEKA.

(vi). Load a data set (ex. Weather dataset, Iris dataset, etc.)

(vii). Load each dataset and observe the following:

i. List the attribute names and they types

ii. Number of records in each dataset

iii. Identify the class attribute (if any)

iv. Plot Histogram

v. Determine the number of records for each class.

vi. Visualize the data in various dimensions

Unit 2 Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets

A. Explore various options available in Weka for preprocessing data and apply (like Discretization Filters, Resample filter, etc.) on each dataset

B. Load each dataset into Weka and run Aprori algorithm with different support and confidence values. Study the rules generated.

C. Apply different discretization filters on numerical attributes and run the Apriori association rule algorithm. Study the rules generated. Derive interesting insights and observe the effect of discretization in the rule generation process.

Unit 3 Demonstrate performing classification on data sets

A. Load each dataset into Weka and run Id3, J48 classification algorithm. Study the classifier output. Compute entropy values, Kappa statistic.

B. Extract if-then rules from the decision tree generated by the classifier, Observe the confusion matrix and derive Accuracy, F-measure, TPrate, FPrate, Precision and Recall values. Apply cross-validation strategy with various fold levels and compare the accuracy results.

C. Load each dataset into Weka and perform Naïve-bayes classification and k-Nearest Neighbour classification. Interpret the results obtained.

D. Plot RoC Curves

E. Compare classification results of ID3, J48, Naïve-Bayes and k-NN classifiers for each dataset, and deduce which classifier is performing best and poor for each dataset and justify.

Unit 4 Demonstrate performing clustering on data sets

A. Load each dataset into Weka and run simple k-means clustering algorithm with different values of k (number of desired clusters)**.** Study the clusters formed. Observe the sum of squared errors and centroids, and derive insights.

B. Explore other clustering techniques available in Weka.

C. Explore visualization features of Weka to visualize the clusters. Derive interesting insights and explain.

Unit 5 Demonstrate performing Regression on data sets

A. Load each dataset into Weka and build Linear Regression model. Study the clusters formed. Use Training set option. Interpret the regression model and derive patterns and conclusions from the regression results.

B. Use options cross-validation and percentage split and repeat running the Linear Regression Model. Observe the results and derive meaningful results.

C. Explore Simple linear regression technique that only looks at one variable.

Resource Sites:

1. http://www.pentaho.com/

2. http://www.cs.waikato.ac.nz/ml/weka/

Outcomes:

o Ability to understand the various kinds of tools.

o Demonstrate the classification, clusters and etc. in large data sets

DATA MINING LAB

Objectives:

- To obtain practical experience using data mining techniques on real world data sets.
- Emphasize hands-on experience working with all real data sets.

List of Sample Problems:

Task 1: Credit Risk Assessment

Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.

2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data.

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

Subtasks: (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes seperately. (5 marks)
2. What attributes do you think might be crucial in making the credit assessment ? Come up with some simple rules in plain English using your selected attributes. (5 marks)
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training. (10 marks)
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy? (10 marks)

5. Is testing on the training set as you did above a good idea? Why or Why not ? (10 marks)
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why? (10 marks)
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss. (10 marks)
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.) (10 marks)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)? (10 marks)
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model? (10 marks)
11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase? (10 marks)
12. (Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3

levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR. (10 marks)

Task Resources:

- Mentor lecture on Decision Trees
- Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:

o Introduction to Weka (html version) (download ppt version)

o Download Weka

o Weka Tutorial

o ARFF format

o Using Weka from command line

Task 2: Hospital Management System

Data Warehouse consists Dimension Table and Fact Table.

REMEMBER The following

Dimension

The dimension object (Dimension):

_ Name

_ Attributes (Levels) , with one primary key

_ Hierarchies

One time dimension is must.

About Levels and Hierarchies

Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent-child relationships among a set of levels.

For example, a typical calendar dimension could contain five levels. Two

hierarchies can be defined on these levels:

H1: YearL > QuarterL > MonthL > WeekL > DayL

H2: YearL > WeekL > DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

About Unique Key Constraints

When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level)

Design a Hospital Management system data warehouse (TARGET) consists of Dimensions Patient, Medicine, Supplier, Time. Where measures are ' NO UNITS', UNIT PRICE.

Assume the Relational database (SOURCE) table schemas as follows

TIME (day, month, year),

PATIENT (patient_name, Age, Address, etc.,)

MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units, Uinit_Price, etc.,)

SUPPLIER :(Supplier_name, Medicine_Brand_name, Address, etc.,)

If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably.

Design the Hospital Management system data warehouse using all schemas. Give the example 4-D cube with assumption names.

Outcomes:

- Ability to add mining algorithms as a component to the exiting tools
- Ability to apply mining techniques for realistic data.

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(A80014) MANAGEMENT SCIENCE

Objectives:

This course is intended to familiarise the students with the framework for the managers and leaders available for understanding and making decisions relating to issues related organisational structure, production operations, marketing, Human resource Management, product management and strategy.

UNIT -I:

Introduction to Management and Organisation: Concepts of Management and organization- nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory – Fayal's Principles of Management – Maslow's theory of Hierarchy of Human Needs – Douglas McGregor's Theory X and Theory Y – Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management. Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

UNIT -II:

Operations and Marketing Management: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement – Business Process Reengineering (BPR) - Statistical Quality Control: control charts for Variables and Attributes (simple Problems) and Acceptance Sampling, TQM, Six Sigma, Deming's contribution to quality. Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records – JIT System, Supply Chain Management, Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT -III:

Human Resources Management (HRM): Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating – Capability Maturity Model (CMM) Levels – Performance Management System.

UNIT -IV:

Project Management (PERT/CPM): Network Analysis, Programme

Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

UNIT -V:

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

TEXT BOOKS:

1. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2004
2. P. Vijaya Kumar, N. Appa Rao and Ashima B. Chhalill, Cengage Learning India Pvt Ltd, 2012.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz and Weihrich: Essentials of Management, McGraw Hill, 2012.
3. Thomas N.Duening and John M.Ivancevich Management—Principles and Guidelines, Biztantra, 2012.
4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2012.
5. Samuel C.Certo: Modern Management, 2012.
6. Schermerhorn, Capling, Poole and Wiesner: Management, Wiley, 2012.
7. Parnell: Strategic Management, Cengage,2012.
8. Lawrence R Jauch, R.Gupta andWilliam F.Glueck: Business Policy and Strategic Management, Frank Bros.2012.
9. Aryasri: Management Science, McGraw Hill, 2012

Outcomes:

By the end of the course, the student will be in a position to

- Plan an organisational structure for a given context in the organisation
- carry out production operations through Work study
- understand the markets, customers and competition better and price the given products appropriately.
- ensure quality for a given product or service
- plan and control the HR function better
- plan, schedule and control projects through PERT and CPM
- evolve a strategy for a business or service organisation

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	4	**-/-/-**	**4**

(A80551) WEB SERVICES

(Elective – III)

Objectives:

- To understand the details of web services technologies like WSDL, UDDI, SOAP
- To learn how to implement and deploy web service client and server
- To explore interoperability between different frameworks

UNIT- I

Evolution and Emergence of Web Services - Evolution of distributed computing, Core distributed computing technologies – client/server, CORBA, JAVA RMI, Microsoft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

Introduction to Web Services – The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

Web Services Architecture – Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication models, basic steps of implementing web services.

UNIT- II

Fundamentals of SOAP – SOAP Message Structure, SOAP encoding, Encoding of different data types, SOAP message exchange models, SOAP communication and messaging, Java and Axis, limitations of SOAP.

UNIT- III

Describing Web Services – WSDL – WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

UNIT- IV

Discovering Web Services – Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI – UDDI registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, Publishing API, Publishing, searching and deleting information in a UDDI Registry, limitations of UDDI.

UNIT- V

Web Services Interoperability – Means of ensuring Interoperability, Overview of .NET, Creating a .NET client for an Axis Web Service, creating Java client for a Web service, Challenges in Web Services Interoperability.

Web Services Security – XML security frame work, Goals of Cryptography, Digital signature, Digital Certificate, XML Encryption.

TEXT BOOK:

1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.

REFERENCE BOOKS:

1. Java Web Service Architecture, James McGovern, Sameer Tyagi et al., Elsevier
2. Building Web Services with Java, 2nd Edition, S. Graham and others, Pearson Edn.
3. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly,SPD.
4. Web Services, G. Alonso, F. Casati and others, Springer.

Outcomes:

- Basic details of WSDL, UDDI, SOAP
- Implement WS client and server with interoperable systems

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	4	**-/-/-**	**4**

(A80538) SEMANTIC WEB AND SOCIAL NETWORKS

(Elective – III)

Objectives:

- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

UNIT- I

Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web.

Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT- II

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web –Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL),UML,XML/XML Schema.

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT- III

Logic, Rule and Inference Engines. Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.

UNIT- IV

XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks.

UNIT- V

Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley interscience,2008.
2. Social Networks and the Semantic Web, Peter Mika,Springer,2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor,O'Reilly, SPD.

Outcomes:

- Ability to understand and knowledge representation for the semantic web.
- Ability to create ontology.
- Ability to build a blogs and social networks.

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	4	**-/-/-**	**4**

(A80537) SCRIPTING LANGUAGES

(Elective – III)

Objectives:

The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications dealing with Bio-information/ Bio-data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development.

UNIT – I

Introduction to PERL and Scripting: Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT – II

Advanced perl: Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

PHP Basics : PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT – III

Advanced PHP Programming: PHP and Web Forms, Files, PHP Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

UNIT - IV

TCL : TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL-eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding , Perl-Tk.

UNIT – V

Python: Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling.

Integrated Web Applications in Python – Building Small, Efficient Python Web Systems, Web Application Framework.

TEXT BOOKS:

1. The World of Scripting Languages , David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dream tech.).

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,I.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Perl by Example, E.Quigley, Pearson Education.
8. Programming Perl,Larry Wall, T.Christiansen and J.Orwant,O'Reilly, SPD.
9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
11. Perl Power, J.P.Flynt, Cengage Learning.
12. PHP Programming solutions, V.Vaswani, TMH.

Outcomes:

- Ability to understand the differences between scripting languages.
- Ability to apply your knowledge of the weaknesses of scripting languages to select implementation..
- Master an understanding of python especially the object oriented concepts.

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	4	**-/-/-**	**4**

(A 80547) MULTIMEDIA & RICH INTERNET APPLICATIONS

(Elective – III)

Objectives:

This course aims to further develop students' competency in producing dynamic and creative graphic solutions for multimedia productions. It provides students with the basic concepts and techniques of interactive authoring. It also introduces students with the advanced scripting skills necessary for implementing highly interactive, rich internet applications using multimedia technologies and authoring tools. Students will develop aesthetic value and competencies in multimedia authoring. Artistic visual style and layout design are stressed, as well as the editing and integration of graphic images, animation, video and audio files. The course allows students to master industry-wide software and technologies to create highly interactive, rich internet applications.

UNIT - I

Fundamental concepts in Text and Image: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT- II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

Multimedia Data Compression: Lossless compression algorithms, Lossy compression algorithms, Image compression standards.

UNIT III

Basic Video compression techniques, Case study: MPEG Video Coding I, Basic Audio compression techniques, Case study: MPEG Audio compression.

Web 2.0 : What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT - IV

Rich Internet Applications(RIAs) with Adobe Flash : Adobe Flash-Introduction, Flash Movie Development, Learning Flash with Hands-on

Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.

Rich Internet Applications(RIAs) with Flex 3 - Introduction, Developing with Flex 3, Working with Components, Advanced Component Development, Visual Effects and Multimedia,

UNIT - V

Ajax- Enabled Rich Internet Application : Introduction, Traditional Web Applications vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xmlhttprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo ToolKit.

TEXT BOOKS:

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI Learning, 2004
2. Professional Adobe Flex 3, Joseph Balderson, Peter Ent, et al, Wrox Publications, Wiley India, 2009.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel, Deitel Developer Series, Pearson Education.

REFERENCE BOOKS:

1. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, 2001, rp 2005.
2. Multimedia Making it work, Tay Vaughan, 7th edition, TMH, 2008.
3. Introduction to multimedia communications and Applications, Middleware, Networks, K.R.Rao, Zoran, Dragored, Wiley India, 2006, rp. 2009.
4. Multimedia Computing, Communications & Applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Education, 2004
5. Principles of Multimedia, Ranjan Parekh, TMH, 2006.
6. Multimedia in Action, James E.Shuman, Cengage Learning, 198, rp 2008.
7. Multimedia Systems design, Prabhat K. Andleigh, Kiran Thakrar, PHI, 1986.
8. Multimedia and Communications Technology, Steve Heath, Elsevier, 1999, rp 2003.
9. Adobe Flash CS3 Professional, Adobe press, Pearson Education, 2007.
10. Flash CS3 Professional Advanced, Russel Chun, Pearson Education, 2007.

11. Flash CS5, Chris Grover, O'Reilly, SPD, 2010.
12. SAMS Teach yourself Adobe flash CS3, Pearson Education, 2007.
13. Flex 4 Cookbook, Joshua Noble, et.al, O'Reilly,SPD 2010.
14. Flex3 – A beginner's guide, Michele E.Davis, Jon A.Phillips, TMH, 2008.
15. Mastering Dojo,R.Gill,C.Riecke and A.Russell,SPD.

Outcomes:

- Ability to create and design rich internet applications.
- Ability to develop different multimedia tools to produce web based and independent user interfaces.

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IV Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A80542) AD HOC AND SENSOR NETWORKS

(Elective – IV)

Objectives:

- To understand the concepts of sensor networks
- To understand the MAC and transport protocols for adhoc networks
- To understand the security of sensor networks
- To understand the applications of adhoc and sensor networks

UNIT- I

Introduction to Ad Hoc Wireless Networks: Characteristics of MANETs, Applications of MANETs, Challenges.

Routing in MANETs: Topology-based versus Position-based approaches, Topology based routing protocols, Position based routing, Other Routing Protocols.

UNIT- II

Data Transmission in MANETs: The Broadcast Storm, Multicasting, Geocasting

TCP over Ad Hoc Networks: TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc

UNIT- III

Basics of Wireless Sensors and Applications: The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

Data Retrieval in Sensor Networks: Classification of WSNs, MAC layer, Routing layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

UNIT- IV

Security : Security in Ad hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

Sensor Network Platforms and Tools: Sensor Network Hardware, Sensor Network Programming Challenges, Node-Level Software Platforms

UNIT- V

Operating System – TinyOS

Imperative Language: nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM

TEXT BOOKS:

1. Ad Hoc and Sensor Networks – Theory and Applications, *Carlos Corderio Dharma P.Aggarwal,* World Scientific Publications / Cambridge University Press, March 2006
2. Wireless Sensor Networks: An Information Processing Approach, *Feng Zhao, Leonidas Guibas*, Elsevier Science imprint, Morgan Kauffman Publishers, 2005, rp2009.

REFERENCE BOOKS:

1. Adhoc Wireless Networks – Architectures and Protocols, C.Siva Ram Murthy, B.S.Murthy, Pearson Education, 2004
2. Wireless Sensor Networks – Principles and Practice, Fei Hu, Xiaojun Cao, An Auerbach book, CRC Press, Taylor & Francis Group, 2010
3. Wireless Ad hoc Mobile Wireless Networks – Principles, Protocols and Applications, Subir Kumar Sarkar, et al., Auerbach Publications, Taylor & Francis Group, 2008.
4. Ad hoc Networking, *Charles E.Perkins*, Pearson Education, 2001.
5. Wireless Ad hoc Networking, *Shih-Lin Wu, Yu-Chee Tseng,* Auerbach Publications, Taylor & Francis Group, 2007
6. Wireless Ad hoc and Sensor Networks – Protocols, Performance and Control, Jagannathan Sarangapani, CRC Press, Taylor & Francis Group, 2007, rp 2010.
7. Security in Ad hoc and Sensor Networks, Raheem Beyah, et al., World Scientific Publications / Cambridge University Press, 2010
8. Ad hoc Wireless Networks – A communication-theoretic perspective, Ozan K.Tonguz, Gialuigi Ferrari, Wiley India, 2006, rp2009.
9. Wireless Sensor Networks – Signal processing and communications perspectives, Ananthram Swami, et al., Wiley India, 2007, rp2009.

Outcomes:

- Ability to understand the concept of ad-hoc and sensor networks.
- Ability to design and implement sensor network protocols.
- Ability to set up and evaluate measurements of protocol performance in sensor networks..

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	4	**-/-/-**	**4**

(A80550) STORAGE AREA NETWORKS

(Elective – IV)

Objectives:

- Understand Storage Area Networks characteristics and components.
- Become familiar with the SAN vendors and their products
- Learn Fibre Channel protocols and how SAN components use them to communicate with each other
- Become familiar with Cisco MDS 9000 Multilayer Directors and Fabric Switches Thoroughly learn Cisco SAN-OS features.
- Understand the use of all SAN-OS commands. Practice variations of SANOS features

UNIT- I

Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

UNIT- II

Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN , Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfills the need , Understand the appropriateness of the different networked storage options for different application environments

UNIT- III

List reasons for planned/unplanned outages and the impact of downtime,

Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

UNIT- IV

Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities

UNIT- V

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain

Virtualization technologies, block-level and file-level virtualization technologies and processes.

Case Studies:

The technologies described in the course are reinforced with EMC examples of actual solutions.

Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOK:

1. EMC Corporation, Information Storage and Management, Wiley.

REFERENCE BOOKS:

1. Robert Spalding, “Storage Networks: The Complete Reference“, Tata McGraw Hill, Osborne, 2003.
2. Marc Farley, “Building Storage Networks”, Tata McGraw Hill, Osborne, 2001.
3. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002.

Outcomes:

- Ability to demonstrate the storage area networks and their products
- Ability to provide the mechanisms for the backup/recovery.

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	4	**-/-/-**	**4**

(A80543) DATABASE SECURITY

(Elective-IV)

Objectives:

- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

UNIT- I

Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions

Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

UNIT- II

Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion

Security Mechanisms : Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

UNIT- III

Security Software Design : Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design

Statistical Database Protection & **Intrusion Detection Systems:** Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery

UNIT- IV

Models For The Protection Of New Generation Database Systems -1: Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases

UNIT- V

Models For The Protection Of New Generation Database Systems -2: A

Model for the Protection of New Generation Database Systems: the Orion Model Jajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOKS:

1. Database Security by Castano *Pearson Edition (*1/e)
2. Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

REFERENCE BOOK:

1. Database security by alfred basta, melissa zgola, CENGAGE learning.

Outcomes:

- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles.

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IV Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**4**

(A80439) EMBEDDED SYSTEMS

(Elective –IV)

Objectives:

- Design embedded computer system hardware
- Design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems
- Use and describe the implementation of a real-time operating system on an embedded computer system
- Formulate an embedded computer system design problem incljuding multiple constraints, create a design that satisfies the constraints, *implement the design in hardware and software, and measure performance against the design constraints
- Create computer software and hardware implementations that operate according to well-known standards
- Organize and write design documents and project reports
- Organize and make technical presentations that describe a design.

UNIT - I

Embedded Computing : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. **(Chapter I from Text Book 1, Wolf).**

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/ Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (**Chapter 3 from Text Book 2, Ayala**).

UNIT - II

Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.

(**Chapters 4,5 and 6 from Text Book 2, Ayala**).

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

(**Chapter 7and 8 from Text Book 2, Ayala**)

UNIT - III

Applications : Interfacing with Keyboards, Displays, D/A and A/D

Conversions, Multiple Interrupts, Serial Data Communication. (**Chapter 10 and 11 from Text Book 2, Ayala**).

Introduction to Real – Time Operating Systems : Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (**Chapter 6 and 7 from Text Book 3, Simon**).

UNIT - IV

Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, HardReal-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/ Locators for Embedded

Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

UNIT – V

Introduction to advanced architectures : ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (**Chapter 8 from Text Book 1, Wolf**).

TEXT BOOKS :

1. Computers and Components, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller , Kenneth J.Ayala, Thomson.

REFERENCE BOOKS :

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

Outcomes:

- Ability to understanding of general system theory and how this applies to embedded system.
- Ability to build a prototype circuit on breadboard using 8051 microcontroller.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	-	**-/-/-**	**2**

(A80087) INDUSTRY ORIENTED MINI PROJECT

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	-	**-/15/-**	**10**

(A80088) PROJECT WORK

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IV Year B.Tech. CSE-II Sem	**L**	**T/P/D**	**C**
	-	**-/-/-**	**2**

(A80090) COMPREHENSIVE VIVA