J. S. UNIVERSITY, SHIKOHABAD

B. TECH.

2nd , 3rd & 4th year

(Computer Science Engineering)

SCHEME

&

SYLLABUS

[Effective from the session 2015-16]

Programme outcomes:

1. Engineering knowledge: The graduates are expected to develop an ability to apply knowledge of mathematics, science and engineering appropriate to the discipline.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

Programme Specific outcomes:

1. Apply standard Software Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success
2. Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems.

STUDY AND EVALUATION SCHEME FOR

B.Tech (Computer Science Engineering).

SEMESTER - THIRD

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTAS-31	Engg Mathematics-III	4	1	-	-	50	100	150	3
2	BTCS-31	Data Structure Using C	4	1	-	-	50	100	150	3
3	BTCS-32	Discrete Structures & Graph Theory	4	1	-	-	50	100	150	3
4	BTCS-33	Computer Based Numerical & Statistical Techniques	4	1	-	-	50	100	150	3
5	BTEC-34	Switching Theory & Logic Design	4	1	-	-	25	50	75	2
6	BTIP-31	Industrial Psychology	4	1	-	-	25	50	75	2
7	BTAC-31	Human Value & Professional Ethics*	2	-	-	-	25	50	75	2
PRACTICA/DRAWING SUBJECTS										
8	BTCS-31P	Data Structures Using C Lab	-	-	2	-	20	30	50	3
9	BTCS-33P	Numerical Techniques Lab	-	-	2	-	20	30	50	3
10	BTCS-34P	Advance Programming Lab	-	-	2	-	20	30	50	3
11	BTEC-34P	Logic Design Lab.	-	-	2	-	20	30	50	3
12	BTGD-30	Games//Social and Cultural Activities + Discipline (25 + 25)							50	
								Grand Total	1000	

*Human values & Professional Ethics will be offered as a compulsory audit course for which passing marksare 30% in End Semester Examination and 40% in aggregate.

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

STUDY AND EVALUATION SCHEME FOR

B.Tech (Computer Science Engineering).

SEMESTER - FOURTH

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTOE-41-BTOE-49	Science Based Open Elective	4	1	-	-	50	100	150	3
2	BTCS-41	Operating System	4	1	-	-	50	100	150	3
3	BTCS-42	Introduction To Microprocessor	4	1	-	-	50	100	150	3
4	BTCS-43	Theory Of Automata And Formal Languages	4	1	-	-	50	100	150	3
5	BTCS-44	Computer Graphics	4	1	-	-	25	50	75	2
6	BTIS-41	Industrial Sociology	4	1	-	-	25	50	75	2
7	BTAC-41	Cyber Security*	2	-	-	-	25	50	75	2
PRACTICA/DRAWING SUBJECTS										
8	BTCS-41P	Operating System Lab	-	-	2	-	20	30	50	3
9	BTCS-44P	Computer Graphics Lab	-	-	2	-	20	30	50	3
10	BTCS-43P	Functional And Logic Programming Lab	-	-	2	-	20	30	50	3
11	BTEC-42P	Microprocessor Lab	-	-	2	-	20	30	50	3
12	BTGD-40	Games//Social and Cultural Activities + Discipline (25 + 25)							50	
								Grand Total	1000	

*Cyber Security will be offered as a compulsory audit course for which passing marksare 30% in End Semester Examination and 40% in aggregate.

List of Open Electives for B. Tech. Courses

SCIENCE BASED OPEN ELECTIVE

BTOE-041	Introduction to Soft Computing (Neural Networks, Fuzzy Logic and Genetic Algorithm)
BTOE-042	Nano Sciences
BTOE-043	Laser Systems and Applications
BTOE-044	Space Sciences
BTOE-045	Polymer Science & Technology
BTOE-046	Nuclear Science
BTOE-047	Material Science
BTOE-048	Discrete Mathematics
BTOE-049	Applied Linear Algebra

STUDY AND EVALUATION SCHEME FOR
FOUR YEAR B.TECH COURSE IN

COMPUTER SCIENCE & ENGG.

SEMESTER - FIFTH

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTCS-51	Design and Analysis of algorithm	4	1	-	-	50	100	150	3
2	BTCS-52	Database Management System	4	1	-	-	50	100	150	3
3	BTCS-53	Principle of Programming Language	4	1	-	-	50	100	150	3
4	BTCS-54	Web Technology	4	1	-	-	50	100	150	3
5	BTCS-55	Computer Architecture	3	1	-	-	25	50	75	2
6	BTMB-51	Engineering Economics	4	1	-	-	25	50	75	2
PRACTICA/DRAWING SUBJECTS										
7	BTCS-51P	Design and Analysis of algorithm Lab	-	-	4	-	20	30	50	3
8	BTCS-52P	Database Management System Lab	-	-	4	-	20	30	50	3
9	BTCS-53P	Principle of Programming Language Lab	-	-	4	-	20	30	50	
10	BTCS-54P	Web Technology Lab	-	-	4	-	20	30	50	3
11	BTGD-50	GP							50	
								Grand Total	1000	

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

STUDY AND EVALUATION SCHEME FOR
FOUR YEAR B.TECH COURSE IN

SEMESTER – SIXTH **COMPUTER SCIENCE & ENGG**.

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTCS-61	Computer Network	4	1	-	-	50	100	150	3
2	BTCS-62	Software Engineering	4	1	-	-	50	100	150	3
3	BTCS-63	Compiler Design	4	1	-	-	50	100	150	3
4	BTCS-64	Concurrent System					50	100	150	3
5	BTCS-65	E-Commerce					25	50	75	2.5
6	BTMB-61	Industrial Management	4	1	-	-	25	50	75	2.5
PRACTICA/DRAWING SUBJECTS										
7	BTCS-61P	Computer Network Lab	-	-	4	-	20	30	50	3
8	BTCS-62P	Software engineering Lab	-	-	4	-	20	30	50	3
9	BTCS-63P	Compiler Design Lab	-	-	4	-	20	30	50	3
10	BTCS-64P	Seminar	-	-	4	-	50		50	3
11	BTGD-60	GP							50	
								Grand Total	1000	

SEMESTER - SIX

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

STUDY AND EVALUATION SCHEME FOR
FOUR YEAR B.TECH COURSE IN
COMPUTER SCIENCE & ENGG.

SEMESTER - VII

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional (Max/Min)	End Exam (Max/Min)	Total	Duration
THEORY SUBJECT										
1	BTOE-71	Quality Management	3	1	-	-	50	100	150	3
2	BTCS-71	Distributed System	3	3	-	-	50	100	150	3
3	BTCS-72	Artificial Intelligence	3	3	-	-	50	100	150	3
4	BTCS-73	Android Operating System	3	3	-	-	50	100	150	3
5	BTCS-74	Cryptography and Network Security	3	3	-	-	50	100	150	3
PRACTICAL/DRAWING SUBJECTS										
	BTCS-71P	Distributed System Lab	-	-		-	20	30	50	3
	BTCS-72P	Industrial Training	-	-		-	50		50	3
	BTCS-73P	Project	-	-		-	100		100	3
	BTGD-70	Games//Social and Cultural Activities + Discipline					50		50	3
Grand Total									1000	

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

STUDY AND EVALUATION SCHEME FOR
FOUR YEAR B.TECH COURSE IN
COMPUTER SCIENCE & ENGG.

SEMESTER - VIII

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional (Max/Min)	End Exam (Max/Min)	Total	Duration
THEORY SUBJECT										
1	BTOE-81	Non -Conventional Energy Resources	4	1	-	-	50	100	150	3
2	BTCS-81	Digital Image Processing	4	1	-	-	50	100	150	3
3	BTCS-82	Real Time System	4	1	-	-	50	100	150	3
4	BTCS-83	Embedded System	4	1	-	-	50	100	150	3
PRACTICA/DRAWING SUBJECTS										
5	BTCS-81P	Seminar	-	-	2	-	50		50	
6	BTCS-82P	Project	-	-	2	-	100	200	300	
7	DAG-23P	Games//Social and Cultural Activities + Discipline					50		50	
Grand Total									1000	

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilised for revision etc.

SEMESTER-III

[BTAS-31] Engg Mathematics-III

Course Outcomes-

1. Transcendental equations analytically with the help of iterations techniques their error analysis also able to solve problems computationally.
2. Come to know about different methods for solving simultaneous system of linear equations with the help of elimination methods, iterative methods.
3. Clarification about Interpolation (different difference table) and its applications.
4. Learn about different techniques for numerical differentiation and integration.
5. Clarification of numerical solutions of ordinary and partial differential equations.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2		2
CO2	3	1		1	
CO3	3	1	1	1	1
CO4	3	1		2	2
CO5	3	1	1	1	2

Unit – I: Function of Complex variable

Analytic function, C-R equations, Harmonic Functions, Cauchy's integral theorem, Cauchy'sintegral formula, Derivatives of analytic functions, Taylor's and Laurent's series, Singularities,Zeroes and Poles, Residue theorem, Evaluation of real integrals of the type.

Unit – II: Integral Transforms

Fourier integral, Complex Fourier transform, Inverse Transforms, Convolution Theorems,Fourier sine and cosine transform, Applications of Fourier transform to simple one dimensionalheat transfer equations, wave equations and Laplace equationsZ- transform and its application to solve difference equations.

Unit – III: Statistical Techniques

Moments, Moment generating functions, Skewness, Kurtosis, Curve fitting, Method of leastsquares, Fitting of straight lines, Polynomials, Exponential curves, Correlation, Linear, non –linear and multiple regression analysis, Binomial, Poisson and Normal distributions, Tests ofsignifications: Chi-square test, t-test.

Unit – IV: Numerical Techniques – I

Zeroes of transcendental and polynomial equations using Bisection method, Regula-falsi methodand Newton-Raphson method, Rate of convergence of above methods.

Interpolation: Finite differences, Newton's forward and backward interpolation, Lagrange's andNewton's divided difference formula for unequal intervals**.**

Unit – V: Numerical Techniques –II

Solution of system of linear equations, Matrix Decomposition methods, Jacobi method, Gauss-Seidal method.Numerical differentiation, Numerical integration, Trapezoidal rule, Simpson's one third andthree-eight rules,Solution of ordinary differential equations (first order,second order and simultaneous) byEuler's, Picard's and fourth-order Runge- Kutta methods.

Test Books:-

1. Peter V. O'Neil, Advance Engineering Mathematics Thomson (Cengage) Learning, 2007.

2. Jain, Iyenger Jain, Numerical Methods for Scientific and Engineering Computation, New Age International, New Delhi

Reference Books:-

1. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publication House,.

2. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya, 1996.

[BTCS-31] Data Structure Using C

Course Outcome-

1. Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.
2. Discuss the computational efficiency of the sorting and searching algorithms.
3. Implementation of Trees and Graphs and perform various operations on these data structure.
4. Understanding the concept of recursion, application of recursion and its implementation and removal of recursion.
5. Identify the alternative implementations of data structures with respect to its performance to solve a real world problem.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	1	2
CO2	3	2	1	1	
CO3	3	2	2		1
CO4	3	1			1
CO5	3		1	1	1

Unit - I

Introduction: Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Timeand Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off.Abstract Data Types (ADT)Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, andColumn Major Order, Application of arrays, Sparse Matrices and their representations.Linked lists: Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List,Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representationand Addition, Generalized Linked List .

Unit – II

Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stackin C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Towerof Hanoi Problem, Simulating Recursion, Principles of recursion, Tail recursion, Removal of recursion Queues,Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementationof queues in C, Dequeue and Priority Queue.

Unit – III

Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and DynamicRepresentation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and LinkedRepresentation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binarytrees, Traversing Threaded Binary trees, Huffman algorithm.

Unit – IV

Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List,Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component,Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm. Transistive Closure and ShortestPath algorithm: Warshal Algorithm and Dijikstra Algorithm, Introduction to Activity Networks

Unit – V

Searching : Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort,Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Practical consideration forInternal Sorting.Search Trees: Binary Search Trees(BST), Insertion and Deletion in BST, Complexity of Search Algorithm,AVL trees, Introduction to m-way Search Trees, B Trees & B+ Trees .Hashing: Hash Function, Collision Resolution StrategiesStorage Management: Garbage Collection and Compaction.

References :

1. Aaron M. Tenenbaum,YedidyahLangsam and Moshe J. Augenstein "Data Structures Using C and C++", PHI Learning Private Limited, Delhi India
2. Horowitz and Sahani, "Fundamentals of Data Structures", *Galgotia Publications* Pvt Ltd Delhi India.
3. A.K. Sharma ,Data Structure Using C, Pearson Education India.

[BTCS-32] Discrete Structures & Graph Theory

Course Outcome-

1. To implement basic discrete structures algorithms.
2. To analyse algebraic techniques and implement algebraic operations.
3. To implement logical problems like Boolean algebra, poker hand problem and birthday problem.
4. To implement closed formula of recursive sequence.
5. Able to use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2			2
CO2	2	1	2		
CO3	2	1	2	3	3
CO4	2	1	1	1	1
CO5	2	1	1	3	2

Unit-I

Set Theory: Introduction, Combination of sets, Multisets, Ordered pairs,Set Identities.Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality ofrelations, Order of relations.Functions: Definition, Classification of functions,Operations on functions, Recursively defined functions.Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Basecases.

Unit-II

Algebraic Structures: Definition, Groups, Subgroupsand order, Cyclic Groups, Cosets, Lagrange's theorem,Normal Subgroups, Permutation and Symmetric groups, Group Homomorphisms, Definition and elementaryproperties of Rings and Fields, Integers Modulo n.

Unit-III

Partial order sets: Definition, Partial order sets,Combination of partial order sets, Hasse diagram.Lattices: Definition, Properties of lattices – Bounded, Complemented, Modular and CompleteLattice,Morphisms of lattices.

Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Booleanexpressions. Simplificationof Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Booleanalgebra. Combinational and sequential Circuits

Unit-IV

Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability,Contradiction, Algebra of proposition, Theory of Inference ,Natural Deduction.Predicate Logic: First order predicate, well formedformula of predicate, quantifiers, Inferencetheory of predicate logic.

Unit-V

Trees : Definition, Binary tree, Binary tree traversal, Binary search tree.Graphs: Definition and terminology, Representation of graphs, Multigraphs, Bipartite graphs,Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph coloring .Recurrence Relation & Generating function: Recursive definition of functions, Recursivealgorithms, Method of solving recurrences.Combinatorics: Introduction, Counting Techniques, Pigeonhole Principle.

References :

1. Liu and Mohapatra, "Elements of Distcrete Mathematics", McGraw Hill
2. Jean Paul Trembley, R Manohar, Discrete Mathematical Structures with Application to Computer Science, McGraw-Hill
3. Y. N. Singh, "Discrete Mathematical Structures", Wiley India, New Delhi, First Edition, August 2010.

[BTCS-33] Computer Based Numerical & Statistical Techniques

Course Outcomes-

1. Obtain an intuitive and working understanding of numerical methods for the basic problems of numerical analysis.
2. Gain experience in the implementation of numerical methods using a computer.
3. Trace error in these methods and need to analyze and predict it.
4. Provide knowledge of various significant and fundamental concepts to inculcate in the students an adequate understanding of the application of Statistical Methods.
5. Demonstrate the concepts of numerical methods used for different applications

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2		1	
CO2	1		3	2	2
CO3	1	2	1	2	3

CO4	1		1		
CO5		3		1	2

Unit –I :

Computer Arithmetic and Errors: Floating Point Arithmetic, Machine epsilon, Round off Error,Chopping Error, Truncation Error, Associative and Distributive Law in Floating Point arithmetic, InherentError, Error propagation, Numerical Instability

Roots of Equation: Secant Method, Newton Raphson Method and Fixed point Iteration Methods forSimple roots and derivation of their rate of convergence, Aitken Acceleration of Convergence, ModifiedNewton Raphson Method for Multiple roots, Birge-Vieta Method for Polynomials, Bairstrow Method forquadratic factors, Computer Algorithms of these methods.

Unit –II

Interpolation: Algorithms and Error Analysis of Lagrange and Newton divided difference interpolations,Relationship in various difference operators, Piecewise Linear Interpolation, Cubic Spline Interpolation,Natural Spline, ChebshevPolynomial Approximations, Lanczos Economization of Power Series

Curve fitting: Linear and Non Linear Least Squares Approximation, ill Conditioning in Least SquaresMethods, Gram-Schmidt Process of Orthogonalization. Computer Algorithms of Least Square Curve Fitting

Unit – III

Differentiation: Methods based on Interpolation and Finite Differences, Richrdson Extrapolation

Integration: Error Analysis of Trepezoidal and Simpson Methods, Newton Cotes Integration Methods,Guassian Integration Methods: Guass Legendre Method, Lobatto Integration Method and Radau IntegrationMethod, Error Terms in Integration Methods

Unit – IV

Solution of Simultaneous Linear Algebraic Equations: Guass Elimination Method, ill ConditionedSystems, Condition Number, Successive Over Relaxation Method, Rate of Convergence

Solution of Ordinary Differential equations: Single Step Methods-Runge-Kutta Second Order, Third Order and Fourth Order Methods, Multi Step Method-Predictor- Corrector Method

Statistical Techniques: Statistical Hypotheses, Test of Hypotheses, Type-I and Type-II Errors, Level ofSignificance, Test involving Normal Distribution

Recommended Books:

oNumerical Methods: M.K. Jain, S.R.K. Iyenger and R.K. Jain
oApplied Numerical Analysis: Curtis F. Gerald and Patrick O. Wheatley
oSchaum's Outline of Theory and Problems of Statistics: Murray R. Spiegel

[BTEC-34] Switching Theory & Logic Design

Course Outcome

1. describe the significance of number systems, conversions, binary codes.
2. discuss different simplification methods for minimizing boolean functions.
3. outline the concepts of various combinational circuits.
4. illustrate the knowledge of sequential logic design, analyze the operation of flipflops, registers and counters.
5. classify Mealy & Moore models and Simplify & Design Sequential machines.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2
CO2	3	2	2	2	2
CO3	2	3	3	3	3
CO4	2	3	2	2	2
CO5	1	3	3	3	3

UNIT-1

Digital system and binary numbers: Signed binary numbers, binary codes. Gate-level minimization: The map method up to four variable, don't care conditions, POS simplification, NAND and NOR implementation, Quine Mc-Clusky method (Tabular method).

UNIT-2

Combinational Logic: Combinational circuits, analysisprocedure, design procedure, binary adder-subtractor, decimal
adder, binary multiplier, magnitude comparator, decoders,encoders, multiplexers

UNIT-3

Synchronous Sequential logic: Sequential circuits, storageelements: latches, flip flops, analysis of clocked sequential
circuits, state reduction and assignments, design procedure.Asynchronous Sequential logic: Analysis procedure, circuit
with latches, design procedure, reduction of state and flowtable, race free state assignment, hazards.

UNIT-4

Registers and counters: Shift registers, ripple counter,synchronous Counter, other counters.Memory and programmable logic: RAM, ROM, PLA, PAL.

Text Book: M. Morris Mano and M. D. Ciletti, "Digital Design", 4th Edition, Pearson Education

Reference Books:

1. Hill & Peterson, "Switching Circuit & Logic Design", Wiley.
2. Mohammad A. Karim and Xinghao Chen, "Digital Design-Basic concepts and Principles", CRC Press Taylor & Francis group, 2010.

[BTIP-31] Industrial Psychology

Course Outcomes-

1. To demonstrate fundamental knowledge about need and scope of industrial- organizational psychology.
2. To be aware of the brief history and various related fields of industrial- organizational psychology.
3. To learn about the processes of employee selection and understand various methods of selection of process with special emphasis on psychological testing.
4. To demonstrate knowledge about the processes about training and performance appraisal.
5. To understand various leadership styles and employee motivation through various theories of motivation.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	1	2
CO2	1	1	1		
CO3	2	2	3	1	1
CO4	1	2		2	2
CO5	1	1	2	1	1

Unit-I

Introduction to Industrial Psychology – Definitions & Scope. Major influences on industrial Psychology-Scientific management and human relations schools Hawthorne Experiments

Unit-II

Individual in Workplace Motivation and Job satisfaction , stress management. Organizational culture, Leadership & group dynamics.

Unit-III

Work Environment & Engineering Psychology-fatigue. Boredom, accidents and safety.Job Analysis, Recruitment and Selection – Reliability & Validity of recruitment tests.

Unit –IV

Performance Management : Training & Development.

References :

1. Miner J.B. (1992) Industrial/Organizational Psychology. N Y : McGraw Hill.

2. Blum & Naylor (1982) Industrial Psychology. Its Theoretical & Social Foundations CBS Publication.

3. Aamodt, M.G. (2007) Industrial/Organizational Psychology : An Applied Approach (5th edition) Wadsworth/Thompson : Belmont, C.A

. 4. Aswathappa K. (2008). Human Resource Management (fifth edition) New Delhi : Tata McGraw Hill.

[BTAC-31] Human Value & Professional Ethics

Course Outcomes-

1. Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
2. Evaluate coexistence of the "I" with the body.
3. Identify and evaluate the role of harmony in family, society and universal order.
4. Understand and associate the holistic perception of harmony at all levels of existence.
5. Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	1	1
CO2	3	1	1		1
CO3	3	1	2	3	1
CO4	3	2		1	
CO5	3	1	3	2	1

Module-1

Course introduction, Needs Basic guidelines

1 Understand the need , basic , guidelines content for process value education.
2. Self Exploration what is it? It content and process, Natural Acceptence and experiential Validation as the mechanism for self exploration.
3 Continues happiness and Prosperty- A look at continues human Aspiration.
4 Understanding Happiness and Prosperty correctly- A critical appraisal of the current senerio.
5 Method to fulfilled the human aspiration

Module -2

Understanding Harmony in human Being (Harmony in Myself)

1. Understanding Harmony as a co – existence of the sentient I and the Material Body.
2. Understanding the need of self (I) and body sukh and suvidha.
3. Understanding the body of an instrument of I (being Doar, seer and enjoyer.
4. Understanding the Charactersticks and activities of (I)

Module -3

Understanding harmony in the Family and Society

1. Understanding harmony in the Family and basic unit of Human interaction.
2. Understanding values in human – Human relationship meaning of nayaya and program for the fulfillment of ensure abhay and tripti.
3. Understanding the meaning of Vishvas difference between intension and competence.
4. Understanding the Harmony in the society (society being an Extension of family - samadhan , Samriddi , Abhay,sahastitva and comprehension of Human goals.

Module -4

Understanding the harmony in the Nature and existence – whole Existence as Co- existence.

1 Understanding the harmony in the Nature.
2 Interconnectedness and mutual fulfillment among the four order of Nature –recyclability ,andself regulation in nature.
3 Holistic prception of Harmony at all levels of existence.

Module – 5 Implication of the above Holistic understanding of Harmony on professional ethics.

1 Natural acceptance of human values.
2 Deffinativeness of ethical human conduct.
3 Basic for humanistic education. Humanstick constitution and human universal order.
4 Case studies of typical holistic technologies , Management model and Production system.
5 Strategy for transition from the presnt stage of universal order.
A - At the level of individual : as socialy and ecologically responsible engineers technologist and manager.
B- At the Level of Society as mutually enriching institution and organisations

[BTCS-31P]DATA STRUCTURE USING C LAB

Course Outcomes-

1. Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.
2. Understand basic data structures such as arrays, linked lists, stacks and queues.
3. Describe the hash function and concepts of collision and its resolution methods.
4. Solve problem involving graphs, trees and heaps.
5. Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	
CO2	3	2	1	2	3
CO3	3	1	2	2	1
CO4	3		2	3	1
CO5	3	1		2	1

Program in C or C++ for following:
1. To implement addition and multiplication of two 2D arrays.
2. To transpose a 2D array.
3. To implement stack using array.
4. To implement queue using array.
5. To implement circular queue using array.
6. To implement stack using linked list.
7. To implement queue using linked list.
8. To implement circular queue using linked list.
9. To implement binary tree using linked list.
10. To implement binary search tree using linked list.
11. To implement tree traversals using linked list.
12. To implement BFS using linked list.

13. To implement DFS using linked list.
14. To implement Linear Search.
15. To implement Binary Search.
16. To implement Bubble Sorting.
17. To implement Selection Sorting.
18. To implement Insertion Sorting.
19. To implement Merge Sorting.
20. To implement Heap Sorting.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

[BTCS-33P] NUMERICAL TECHNIQUES LAB

Course Outcomes-

1. Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
2. Apply numerical methods to obtain approximate solutions to mathematical problems.
3. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
4. Analyse and evaluate the accuracy of common numerical methods.
5. Implement numerical methods in Matlab.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	2
CO2	3	3	1	2	2
CO3	3	2	1	2	1
CO4	3	1	2	2	1
CO5	3	2	2	1	1

Write Programs in 'C' Language:

1. To deduce error involved in polynomial equation.
2. To Find out the root of the Algebraic and Transcendental equations using Bisection, Regula-falsi, Newton Raphson and Iterative Methods. Also give the rate of convergence of roots in tabular form for each of these methods.
3. To implement Newton's Forward and Backward Interpolation formula.
4. To implement Gauss Forward and Backward, Bessel's, Sterling's and Evertt's Interpolation formula
5. To implement Newton's Divided Difference and Langranges Interpolation formula.
6. To implement Numerical Differentiations.
7. To implement Numerical Integration using Trapezoidal, Simpson 1/3 and 0Simpson 3/8 rule.
8. To implement Least Square Method for curve fitting.
9. To draw frequency chart like histogram, frequency curve and pie-chart etc.
10. To estimate regression equation from sampled data and evaluate values of standard deviation, t-statistics, regression coefficient, value of R2 for atleast two independent variables.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

[BTCS-34P] ADVANCE PROGRAMMING LAB

Course Outcomes-

1. Given a computational problem, identify and abstract the programming task involved.
2. Approach the programming tasks using techniques learned and write pseudo-code.
3. Choose the right data representation formats based on the requirements of the problem.
4. Select the right algorithmic paradigm (such as greedy, dynamic programming, divide and conquer etc.).
5. Write the program on a computer, edit, compile, debug, correct, recompile and run it.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2
CO2	3	2	2	2	1
CO3	3	2	3	1	1
CO4	3	2	2	1	1
CO5	3	1	1	2	2

LIST OF EXPERIMENTS:

1. Programs using Functions and Pointers in C
2. Programs using Files in C
3. Programs using Classes and Objects
4. Programs using Operator Overloading
5. Programs using Inheritance, Polymorphism and its types
6. Programs using Arrays and Pointers
7. Programs using Dynamic memory allocation
8. Programs using Templates and Exceptions
9. Programs using Sequential and Random access files

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

[BTEC-34P] LOGIC DESIGN LAB

Course Outcomes-

1. Describe the truth tables of different Combinational & Sequential circuits.
2. Construct Boolean functions using logic gates.
3. Analyse different Combinational & Sequential circuits.
4. Design different Combinational & Sequential circuits .
5. to design a combinational logic circuit for a given problem statement, and to activate it under specific conditions and test it using LabVIEW.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	1	1
CO2	3	2	3	2	2
CO3	3	2	2	2	3
CO4	3	2	2	2	2
CO5	3	2	3	1	2

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, Concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs.
2. Implementation of the given Boolean function using logic gates in both SOP and POS forms.
3. Verification of state tables of RS, JK, T and D flip-flops using NAND & NOR gates.
4. Implementation and verification of Decoder/De-multiplexer and Encoder using logic gates.
5. Implementation of 4x1 multiplexer using logic gates.
6. Implementation of 4-bit parallel adder using 7483 IC.
7. Design, and verify the 4-bit synchronous counter.
8. Design, and verify the 4-bit asynchronous counter.
9. Mini Project (Imp)

SEMESTER-IV
SCIENCE BASED OPEN ELECTIVES

[BTOE-41] INTRODUCTION TO SOFT COMPUTING (Neural Networks, Fuzzy Logic and Genetic Algorithm)

Course Outcomes-

1. To develop an understanding of computing paradigms and compare them.
2. To be able to choose a particular deployment model according to scenario.
3. Design and develop cloud and implement various services on cloud.
4. To develop an understating of virtualization technology and its different dimensions.
5. Investigate the issues and challenges in implementing cloud security and mobile cloud security.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	1	2
CO2	3	3	3	2	1
CO3	3	3	2	1	1
CO4	3	3	1		2
CO5	3	3	1	1	1

Unit-I : Neural Networks-1(Introduction & Architecture)

Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions,Neural network architecture: single layer and multilayer feed forward networks, recurrent networks.Various learning techniques; perception and convergence rule, Auto-associative and hetro-associative memory.

Unit-II : Neural Networks-II (Back propogation networks)

Architecture: perceptron model, solution, single layer artificial neural network, multilayer perception model; back opogation learning methods, effect of learning rule co-efficient ;back propagation algorithm, factors affecting backpropagation training, applications.

Unit-III : Fuzzy Logic-I (Introduction)

Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations, Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion.

Unit-IV : Fuzzy Logic –II (Fuzzy Membership, Rules)

Membership functions, interference in fuzzy logic, fuzzy if-then rules, Fuzzy implications and Fuzzy algorithms, Fuzzyfications&Defuzzificataions, Fuzzy Controller, Industrial applications.

Unit-V : Genetic Algorithm(GA)

Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications.

Text Books:

1. S. Rajsekaran& G.A. VijayalakshmiPai, "Neural Networks,Fuzzy Logic and Genetic Algorithm:Synthesis and Applications" Prentice Hall of India.
2. N.P.Padhy,"Artificial Intelligence and Intelligent Systems" Oxford University Press.

Reference Books:

3. SimanHaykin,"Neural Netowrks"Prentice Hall of India
4. Timothy J. Ross, "Fuzzy Logic with Engineering Applications" Wiley India.

[BTOE-42] NANO SCIENCES

Course Outcomes-

1. Explain the fundamental principles of nanotechnology and their application to biomedical engineering.
2. Apply engineering and physics concepts to the nano-scale and non-continuum domain.
3. Identify and compare state-of-the-art nanofabrication methods and perform a critical analysis of the research literature.
4. Design processing conditions to engineer functional nano-materials.
5. Evaluate current constraints, such as regulatory, ethical, political, social and economical, encountered when solving problems in living systems.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	2	2	1
CO2	2	1	2	2	1
CO3	1	2	1	1	2
CO4	1	2	1	1	2
CO5			1		1

UNIT -1 :

Introduction:

Difinition of Nano-Science and Nano Technology, Applications of Nano-Technology.

Introduction to Physics of Solid State:

Structure: Size dependence of properties; crystal structures, face centered cubic nanoparticles; Tetrehedrally bounded semiconductor structures; lattice vibrations.

Energy Bands: Insulators, semiconductor and conductors; Reciprocal space; Energy bands and gaps of semiconductors; effective masses; Fermi Surfaces.

Localized Particles: Acceptors and deep taps; mobility; Excitons.

UNIT-2

Quantum Theory For Nano Science:

Time dependent and time independent Schrodinger wave equations. Particle in a box, Potential step: Refelection and tunneling(Quantum leak). Penetration of Barrier, Potential box(Trapped particle in 3D:Nanodot), Electron trapped in 2D plane(Nano sheet), Quantum confinerment effect in nano materials.

Quantum Wells, Wires and Dots

Preparation of Quantum Nanostructure; Size and Dimensionality effect, Fermigas; Potential wells; Partial confinement; Excitons; Single electron Tunneling, Infrared etectors; Quantum dot laser Superconductivity.

Properties of Individual Nano particles

Metal Nano clusters: Magic Numbers; Theoretical Modelling of Nanopraticles; geometric structure; electronic structure; Reactivity; Fluctuations Magnetic Clusters; Bulle to Nano structure.

Semi conducting Nanoparticles: Optical Properties; Photofragmentation; Coulmbic explosion.

Rare Gas & Molecular Clusters: Inert gas clusters; Superfluid clusters molecular clusters.

UNIT-3

Growth Techniques of Nanomaterials:

Lithograpahic and Nonlithograpahic techniques, Sputtering and film deposition in glow discharge, DC sputtering technique(p-$CuAlO_2$ deposition). Thermal evaporation technique, E-beam evaporation, Chemical Vapour deposition(CVD), Synthesis of carbon nano-fibres and multi-walled carbon nanotubes, Pulsed Laser Deposition, Molecular beam Epitoxy, Sol-Gel Techniuqe (No chemistry required), Synthesis of nanowires/rods, Electrodeposition, Chemical bath deposition, Ion beam deposition system, Vapor-Liquid–Solid (VLS) method of nanowires.

UNIT -4

Methods of Measuring Properties:

Structure: Crystallography, particle size determination, surface structure,

Microscopy: Scanning Prob Microscopy (SPM), Atomic Force Microscopy (AFM), Field Ion Microscopy, Scanning Electron Microscopy, Transmission Elecrtron Microscopy (TEM)

Spectroscopy: Infra red and Raman Spectroscopy, X-ray Spectroscopy, Magnetic resonance, Optical and Vibrational Spectroscopy, Luninscence.

UNIT-5

Buckey Ball:

Nano structuresofcarbon(fullerene):

Carbon nano-tubes: Fabrication , structure. electrical, mechanical, and vibrational properties and applications. Nano diamond, Boron Nitride Nano-tubes, single elecron transistors, Moelcular machine, Nano-Biometrics, Nano Robots.

Text/Reference Books:

1. C.P.Poole Jr F.J. Owens, "Introduction to Nanotechnology".
2. "Introduction to S.S. Physics" - (7th Edn.) Wiley 1996.

[BTOE-43] LASER SYSTEMS AND APPLICATIONS

Course Outcomes-

1. To acquire a thorough understanding of the theory of modern Laser Physics.
2. understand different types of modern lasers and their applications.
3. computationally verify material properties for Laser production and uses.
4. compare the function and properties of a number of common laser.
5. verify properties of materials used for laser production.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2	1	2	1
CO2	2	2		2	1
CO3	2	2	1	2	
CO4	2	2	1		1
CO5	2	1	1	2	1

UNIT-I & II

Introduction:

Review of elementary quantum physics, Schrodinger equation, concept of coherence, absorption, spontaneous emission and stimulated emission processes, relation between Einstein's A and B coefficients, population inversion, pumping, gain, optical cavities.

UNIT-III & IV

Lasers & Laser Systems:

Main components of Laser, principle of Laser action, introduction to general lasers and their types. Three & four level Lasers, CW & Pulsed Lasers, atomic, ionic, molecular, excimer, liquid and solid state Lasers and systems, short pulse generation and Measurement.

UNIT-V

Applications:

Laser applications in medicine and surgery, materials processing, optical communication, metrology and LIDAR and holography.

Text/ Reference Books:

1. K.R. Nambiar, "Laser Principles, Types and Application" New Age International.
2. S. A. Ahmad, "Laser concepts and Applications" New Age Internati

[BTOE-44] SPACE SCIENCES

Course Outcome-

1. To understand the phenomenon of parallax in the celestial objects.
2. Effect of the aberration in celestial objects.
3. Causes of the processional motion of the earth.
4. To learn the precession and Nutation effect.
5. To understand the phenomenon of the solar and lunar eclipses.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	1
CO2	2	1	1	2	1
CO3	2	1	1	2	
CO4	1	2	1	1	1
CO5	1	2			1

1. Introduction:

Introduction to space science and applications, historical development

2. Solar System:

Nebular theory of formation of our Solar System.Solar wind and nuclear reaction as the source of energy.

Sun and Planets: Brief description about shape size, period of rotation about axis and period of revolution, distance of planets from sun, Bode's law, Kepler's Laws of planetary motion, Newton's deductions from Kepler's Laws, Newton's Law of gravitation, correction of Kepler's third law, determination of mass of earth, determination of mass of planets with respect to earth. Brief description of Asteroids, Satellites and Comets.

3. Stars:

Stellar spectra and structure, stellar evolution, nucleo-synthesis and formation of elements.

Classification of stars: Harvard classification system, Hertzsprung-Russel diagram,

Luminosity of star, variable stars; composite stars (white dwarfs, Neutron stars, black hole, star clusters, supernova and binary stars); Chandrasekhar limit.

4. Galaxies:

Galaxies and their evolution and origin, active galaxies and quasars.

5. Creation of Universe:

Early history of the universe, Big-Bang and Hubble expansion model of the universe,cosmic microwave background radiation, dark matter and dark energy.

Text Books / Reference Books:

1. K. S. Krishnaswami, "Astrophysics: A modern Perspective" New Age International.
2. K. S. Krishnaswami, "Understanding cosmic Panorama" New Age International.

[BTOE-45] POLYMER SCIENCE AND TECHNOLOGY

Course outcomes-

1. Analyze microscopic chemistry in terms of atomic and molecular orbital and intermolecular forces.
2. Rationalize bulk properties and processes using thermodynamic considerations.
3. Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
4. Rationalize periodic properties such as ionization potential, electro negativity, oxidation states and electro negativity.
5. List major chemical reactions that are used in the synthesis of molecules.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	1	2	2	2
CO2	3	2	1	2	1
CO3	3	2	1	1	1
CO4	1	2	1	1	
CO5	1	1	1		1

UNIT –I & II

POLYMERS:

Introduction, chemistry of polymer synthesis, polymer reaction kinetics, physical properties and characterization of polymers, effect of structure on properties of polymers, organic polymers.Introduction to high performance polymers and composites and their processing.

UNIT –III & IV

POLYMERIZATION:

Introduction, step-growth polymerization, free radical chain growth polymerization, emulsion polymerization, ionic and cationic polymerization, chain statistics and rubber elasticity.

UNIT – UNIT –V & VI

PREPARATION AND APPLICATIONS:

Preparation, properties and technical applications of thermo-plastics (PVC, PVA), thermostats (PF, UF) and elastomers (SBR, GR-N), silicones.Application of polymers in space, ocean, electronics, medical, agriculture, automobile, sports and building construction.

[BTOE-46] NUCLEAR SCIENCE

Course outcomes-

1. To introduce properties of nuclei and details of popular nuclear models.
2. To derive and discuss properties of nuclear decays and nuclear reactions in brief.
3. To familiarize with the fundamental forces and the dynamics of elementary particles under these forces.
4. To overview basic relativistic quantum mechanics and quantum electrodynamics for particle physics.
5. the structure of nuclei, and simple nuclear models such as the liquid drop model and the shell model.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	1	1
CO2	2	2	2	2	
CO3					1
CO4	2	1	2	2	1
CO5	1	1	1	2	1

UNIT-I

Nucleus and Its Basic Features:

Nuclear structure; nuclear forces and their properties, nuclear stability, nuclear radius and its meassurement, nuclear spin, nuclear magnetic and electrical moments.

UNIT-II

Nuclear Models:

Single particle model, liquid drop model and semi-emperical mass formula, nuclear potential and shell model, collective model.

UNIT-III

Nuclear Reaction:

Nuclear reaction and laws of conservation, types of nuclear reaction, mechanism of nuclear reaction, nuclear fission & binuclear fusion and their explanation by liquid drop model.

UNIT-IV

Nuclear Decay:

Decay constant, half life period and mean life, alpha decay, beta decay, gamma decay, interaction of nuclear radiation with matter.

Nuclear Instruments-I

Mass spectrograph,: General principle, Aston's Mass Spectrograph.

UNIT-V

Nuclear Instruments-II

Accelerators: Van de Graph Generator, Cyclotron, Synchrotron.

Detectors: G M Counter, Scintillation counter, cloud chamber, Bubble Chamber, production and detection of neutrons and Gamma-photon.

Application of Nuclear Techniques: Nuclear magnetic resonance, positron emission topography, radiotracer techniques and applications in material science and agriculture.

Text Books:

1. Tayal, "Nuclear Physics" Himalaya Publishing House.
2. S.N. Ghosal, "Nuclear Physics" S. Chand & Co.

Reference Books:

6. Roy & Nigam, "Nuclear Physics" John Wiley & sons.
7. W.E. Burcham, "Nuclear Physics" Longmans Publications.

[BTOE-47] MATERIAL SCIENCE

Course Outcomes-

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1		1
CO2	2			2	1
CO3	1	1	1	2	1
CO4	1	1	1	1	1
CO5	1	1	1	1	

UNIT-I

Introduction: Historical perspective, importance of materials, Brief review of modern & atomic concepts in Physics and Chemistry. Atomic models, Periodic table, Chemical bonding.

Crystallography and imperfections:

Concept of unit cell, space lattice, Bravais lattices, common crystal structures, Atomic packing factor and density. Miller indices.X-ray crystallography techniques, imperfections, Defects & Dislocations in solids. .

UNIT-II

Mechanical Properties and Testing: Stress strain diagram, Ductile and brittle materials, stress Vs strength, toughness, hardness, fracture, fatigue and creep. Testing, such as Strength testing, Hardness testing, Impact testing, Fatigue testing Creep testing, Non-destructive testing (NDT)

Micro Structural Exam: Microscope principle and methods, Preparation of samples and microstructure exam and grain size determination, comparative study of microstructure of various metals and alloys, such as Mild steel, CI, Brass.

Phase Diagram and Equilibrium Diagram: Uniary and Binary diagrams, Phase rules, Types of equilibrium diagrams: solid solution type, eutectic type and combination type, Iron-carbon equilibrium diagram.

UNIT-III

Ferrous materials: Iron and steel manufacture, furnaces, various types of carbon steels, alloy steels and cast irons, its properties and uses.

Heat Treatment: various types of heat treatment, such as Annealing, Normalizing, Quenching, Tempering and Case hardening. Time Temperature Transformation (TTT) diagrams.

Non-Ferrous metals and alloys: Non-ferrous metals, such as Cu, Al, Zn, Cr, Ni etc. and its applications. Various types of Brass, Bronze bearing materials their properties and uses. Aluminum alloys, such as Duralumin, Other advanced materials/alloys.

UNIT-IV

Magnetic properties: Concept of magnetism- Dia, para, ferro magnetic materials, Hysteresis, Soft and hard magnetic materials, Magnetic Storages.

Electric Properties: Energy band, concept of conductor, insulator and semi conductor. Intrinsic and extrinsic semi-conductors, P-n junction and transistors, Basic devices and their applications.diffusion of Solid

Super conductivity and its applications, Messier effect. Type I& II superconductors. High Temp. superconductors.

UNIT-V

Ceramics: Structure, types, properties and applications of ceramics. Mechanical/Electrical behaviour and processing of ceramics.

Plastics: Various types of polymers/plastics and their applications. Mechanical behaviour and processing of plastics, Future of plastics.

Other Materials: Brief description of other materials, such as optical and thermal materials, concrete, composite materials and their uses.

Other Materials: Brief description of other materials, such as optical and thermal materials, concrete, composite materials and their uses.

Performance of materials in service: Brief theoretical consideration of fracture, fatigue, and corrosion and its control.

Text / Reference Books:

1. W.D. Callisster Jr. "Material Science & Engineering Addition" - Wesly Publishing Co.
2. Van Vlash, "Elements of Material Science & Engineering", John Wiley & Sons

[BTOE-48] DISCRETE MATHEMATICS

Course Outcomes-

1. Ability to apply mathematical logic to solve problems.
2. Understand sets, relations, functions and discrete structures.
3. Able to use logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions.
4. Able to formulate problems and solve recurrence relations.
5. Able to model and solve real world problems using graphs and trees.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2		2	2
CO2	2	1	1	1	2
CO3	2		1		1
CO4		1	1	1	1
CO5	1	1		2	1

UNIT-I

Set Theory: Definition of Sets, Venn Diagrams, complements, cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), proofs of some general identitites on sets, pigeonhole principle.

Relation: Definition, types of relation, composition of relations, domain and range of a relation, pictorial representation of relation, properties of relation, partial ordering relation.

Function: Definition and types of function, composition of functions, recursively defined functions.

UNIT-II

Propositional logic: Proposition logic, basic logic, logical connectives, truth tables, tautologies, contradiction , normal forms(conjunctive and disjunctive), modus ponens and modus tollens, validity, predicate logic, universal and existential quantification.

Notion of proof: proof by implication, converse, inverse, contrapositive, negation, and contradiction, direct proof, proof by using truth table, proof by counter example.

UNIT-III

Combinatories: Mathematical induction, recursive mathematical definitions, basics of counting, permutations, combinations, inclusion-exclusion, recurrence relations (n_{th} order recurrence relation with constant coefficients, Homogeneous recurrence relations, Inhomogeneous recurrence relation), generating function (closed form

expression, properties of G.F., solution of recurrence relation using G.F, solution of combinatorial problem using G.F.)

Unit-IV

Algebraic Structure: Binary composition and its properties definition of algebraic structure; Groyas Semi group, Monoid Groups, Abelian Group, properties of groups, Permutation Groups, Sub Group, Cyclic Group, Rings and Fields (definition and standard results).

UNIT-V

Graphs:

Graph terminology, types of graph connected graphs, components of graph, Euler graph, Hamiltonian path and circuits, Graph coloring, Chromatic number.

Tree: Definition, types of tree(rooted, binary), properties of trees, binary search tree, tree traversing (preorder, inorder, postorder).

Finite Automata: Basic concepts of Automation theory, Deterministic finite Automation(DFA), transition function, transition table, Non Deterministic Finite Automata (NDFA), Mealy and Moore Machine, Minimization of finite Automation.

Text/Reference Books:

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Mc.Graw Hill, 2002.
2. V. Krishnamurthy, "Combinatories:Theory and Applications", East-West Press.

[BTOE-49] APPLIED LINEAR ALGEBRA

Course Outcomes-

1. Analyze and Solve systems of linear equations using augmented matrices.
2. Develop an understanding of the algebra of matrices in order to solve applied and theoretical problems using inverses of matrices, determinants and other algebraic operations.
3. Analyze linear combinations of vectors in Rn and identify sets of vectors that are linearly independent.
4. Determine if a set of vectors is a vector space, a subspace, or a basis for a vector space.
5. Compute eigenvalues and eigenvectors, determine if a matrix is diagonalizable, and solve systems of linear ordinary differential equations.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2	1		
CO2	1	1	1	1	1
CO3	1	1	2		
CO4	1	1	1	1	1
CO5	1	2	2	1	

UNIT-1

Fields, Vector-spaces, sub-spaces, linear-combination, linear-dependence and independence.Basis, dimensions and coordinates (each and every fact to be illustrated by suitable examples).

UNIT-2

Linear-transformation, definition and examples, matrix representation, similarity, range and kernel, rank-nullity theorem and its consequences.

UNIT-3

Singular and non singular linear transformations, sum and product of linear transformations, vector space of linear transformations, nilpotent linear transformations.

UNIT-4

Inner product spaces, definition and examples, orthogonality, Cauchy-Schwartz Inquality, Minkowski Inequality, polarization Identity, complete ortho normal set, Bessel's Inequality, Gram-Schmidt's orthogonalization process.

UNIT-5

Linear functional, definition and examples, vector space of linear functional, dual vector spaces, adjoint, self adjoint, unitary and normal operators, examples and properties, eigen values and eigen vectors, diagonalisation of linear operators, quadratic forms, principle axis theorem(without proof), some applications to engineering problems.

TEXT/REFERENCE BOOKS

1. Dym, H. Linear Algebra in action, University Press.2012
2. Halmos, P.R.: Finite Dimensional Vector Spaces (1990) Narosa.

[BTIS-41] Industrial Sociology

Course Outcome-

1. Students understood discipline and basic concept in sociology and social structure.
2. Students are able to understand social issues and are empowered to face social problems.
3. Students are familiarized with social, political, economical and intellectual context's and understand social thoughts.
4. Students are able to provide a comprehensive profile of Tribal people in India.
5. Students are able to provide an Introduction of Social Structure & Social Change.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	1
CO2	3	2	1	2	1
CO3	3	1	1	1	2
CO4	3	1	2	1	2
CO5	3	2	2	1	

Unit-I Industrial Sociology: Nature,Scope and Importance of Industrial Sociology. Social Relations in Industry, Social Organization in Industry- Bureaucracy,Scientific Management and Human Relations**.**

Unit-II Rise and Development of Industry: Early Industrialism – Types of Productive Systems – The Manorial or Feudal system. The Guild system, The domestic or putting-out system,and the Factory system. Characteristics of the factory system.Causes and Consequences of industrialization.Obstacles to and Limitations of Industrialization**.**

Unit-III Industrialization in India: Industrial Policy Resolutions – 1956.Science.Technology andInnovation Policy of India 2013.

Unit-IV Contemporary Issues: Grievances and Grievance handling Procedure. Industrial Disputes:causes,Strikes and Lockouts.Preventive Machinery of Industrial Disputes:Schemes of Workers Participation in Management- Works Committee,Collective Bargaining, Bi-partite & Tri-partite Agreement,Code of Discipline,Standing Orders. Labour courts & Industrial Tribunals.

References : 1. GISBERT PASCAL, Fundamentals of Industrial sociology, Tata McGraw Hill Publishing Co., New Delhi, 1972.

2. SCHNEIDER ENGNO V., Industrial Sociology 2nd Edition, McGraw Hill Publishing Co., New Delhi, 1979.

3. MAMORIA C.B. And MAMORIA S., Dynamics of Industrial Relations in India.

[BTAC-41] Cyber Security

Course Outcomes-

1. Analyse and evaluate the cyber security needs of an organization.
2. Conduct a Cyber security risk assessment.
3. Measure the performance and troubleshoot cyber security systems.
4. Implement cyber security solutions.
5. Be able to use cyber security, information assurance, and cyber/computer forensics software/tools.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	1	2
CO2	3	2	3	1	2
CO3	3	2	2	1	2
CO4	3	2	2	2	2
CO5	3	2	2	2	1

UNIT-1 Introduction to information systems, Types of information Systems, Development of Information Systems, Introduction to information security, Need for Information security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis.

UNIT-2 Application security (Database, E-mail and Internet), Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail viruses, Macro viruses, Malicious Software, Network and Denial of Services Attack, Security Threats to E-Commerce-Electronic Payment System, eCash,Credit/Debit Cards. Digital Signature, public KeyCryptography.

UNIT-3 Developing Secure Information Systems, Application Development Security, Information Security Governance & Risk Management, Security Architecture & Design Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets, Access Control,CCTV and intrusion Detection Systems, Backup Security Measures.

UNIT-4 Security Policies, Why Policies should be developed, WWW policies, Email Security policies, PolicyReview Process-Corporate policies-Sample Security Policies, Publishing and Notification Requirement ofthe Policies.Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; ITAct 2000 Provisions,Intellectual Property Law: Copy Right Law, Software License, Semiconductor Lawand Patent Law.

References :

1. Charles P. Pfleeger, Shari LawerancePfleeger, “Analysing Computer Security ”, Pearson Education India.

2. V.K. Pachghare, “Cryptography and information Security”, PHI Learning Private Limited, Delhi India.

3.Dr. Surya Prakash Tripathi, RitendraGoyal, Praveen kumar Shukla ,”Introduction to Information Security and

Cyber Law” Willey Dreamtech Press.

[BTCS-41] OPERATING SYSTEM

Course Outcomes-

1. Differentiate between multiprocessing, multiprogramming, and multitasking.
2. Differentiate between programs, processes and threads.
3. Apply segmentation and paging techniques.
4. Compare file naming in Linux and Windows.
5. Awareness of Android Operating System.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2	2	3	1
CO2	2	2	2	1	1
CO3	2	2	1	1	1
CO4	2	1	1	1	1
CO5	1	1	1	2	1

Unit – I

Introduction : Operating system and functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multiprocess Systems, Multithreaded Systems, Operating System Structure- Layered structure, System Components, Operating System services, Reentrant Kernels, Monolithic and Microkernel Systems.

Unit – II

Concurrent Processes: Process Concept, Principle ofConcurrency, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Dekker's solution, Peterson's solution, Semaphores, Test and Set operation; Classical Problem in Concurrency- Dining Philosopher Problem, Sleeping Barber Problem; Inter Process Communication models and Schemes, Process generation.

Unit – III

CPU Scheduling: Scheduling Concepts, Performance Criteria, Process States, Process Transition Diagram, Schedulers, Process Control Block (PCB), Process address space, Process identification information, Threads and their management, Scheduling Algorithms, Multiprocessor Scheduling. Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.

Unit – IV

Memory Management: Basic bare machine, Resident monitor, Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Protection schemes, Paging, Segmentation, Paged segmentation, Virtual memory concepts, Demand paging, Performance of demand paging, Page replacement algorithms, Thrashing, Cache memory organization, Locality of reference.

Unit – V

I/O Management and Disk Scheduling: I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. File System: File concept, File organization and access mechanism, File directories, and File sharing, Filesystem implementation issues, File system protection and security.

References :

1. Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley 2. SibsankarHalder and Alex A Aravind, "Operating Systems", Pearson Education 3. Harvey M Dietel, " An Introduction to Operating System", Pearson Education 4. D M Dhamdhere, "Operating Systems : A Concept basedApproach", McGraw Hill. 5. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education". 6. Stuart E. Madnick & John J. Donovan. Operating Systems. McGraw Hill

[BTCS-42]INTRODUCTION TO MICROPROCESSOR

Course Outcomes-

1. Understand the basic architecture of 8085 and 8086.
2. Impart the knowledge about the instruction set.
3. Develop skill in simple program writing for 8085 & 8086 and applications.
4. Understand the basic idea about the data transfer schemes and its applications.
5. Develop skill in simple program writing for INTEL 8085 and INTEL 8086.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2
CO2	3	2	2	1	1
CO3	1	2	2	1	1
CO4	1	2	1	1	1
CO5	1	2	1	1	1

UNIT I

Introduction to Microprocessor, Microprocessor architecture and its operations, Memory, Input & output devices, Logic devices for interfacing, The 8085 MPU,Example of an 8085 based computer, Memory interfacing.

UNIT II

Basic interfacing concepts, Interfacing output displays, Interfacing input devices, Memory mapped I/O, Flow chart symbols, Data Transfer operations, Arithmetic operations, Logic Operations, Branch operation, Writing assembly language programs, Programming techniques: looping, counting and indexing.

UNIT III

Additional data transfer and 16 bit arithmetic instruction, Arithmetic operations related to memory, Logic operation: rotate, compare, counter and time delays, Illustrative program: Hexadecimal counter, zero-to-nine, (module ten) counter, generating pulse waveforms, debugging counter and time delay, Stack, Subroutine, Restart, Conditional call and return instructions, Advance subroutine concepts, The 8085 Interrupts, 8085 vector interrupts.

UNIT IV

Program: BCD-to-Binary conversion, Binary-to-BCD conversion, BCD-to-Seven segment code converter, Binary-to-ASCII and ASCII-to-Binary code conversion, BCD Addition, BCD Subtraction, Introduction to Advance instructions and Application, Multiplication, Subtraction with carry.

UNIT V

8255 Programmable peripheral interface, interfacing keyboard and seven segment display, 8254 (8253) programmable interval timer, 8259A programmable interrupt controller, Direct Memory Access and 8237 DMA controller. Introduction to 8086 microprocessor: Architecture of 8086 (Pin diagram, Functional block diagram, Register organization).

References :

1. Ramesh Gaonkar, “Microprocessor Architecture, Programming, and Applications with the 8085”, 5th Edition, Penram International Publication (India) Pvt. Ltd.
2. * Douglas V. Hall, “Microprocessors and Interfacing”, , Tata McGraw Hill.
3. Yu-cheng Liu, Glenn A.Gibson, “Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design”, Second Edition, Prentice Hall of India.
4. Barry B. Brey, “The Intel Microprocessors, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumIII, Pentium IV, Architecture, Programming & Interfacing”, Eighth Edition, Pearson Prentice Hall, 2009.
5. Peter Abel, “IBM PC Assembly language and programming”, Fifh Edition, Prentice Hall of India Pvt. Ltd
.6. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, “The 8051 Microcontroller and Embedded Systems: Using Assembly and C”, Pearson education,

[BTCS-43] THEORY OF AUTOMATA AND FORMAL LANGUAGES

Course Outcomes-

1. Discuss properties of different grammars and languages.
2. Solve problems related to string membership to an automata and respective Language.
3. Create grammar for specific language.
4. Identify language accepted by particular automata.
5. Design optimum automata for particular language.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	2	3
CO2	2	1	2	2	3
CO3	2	1	1	1	3
CO4	2	1	1	1	1
CO5		1	1	1	1

Unit – I

Introduction; Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), NFA with epsilon transi ion, Language of NFA, Equi valence of NFA and DFA, Minimization of Finite Automata, Distinguis hing one string from other, Myhill-Nerode Theorem

Unit – II

Regular expression (RE) , Definition, Operators of regular expression and their precedence, Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Arden Theorem, Non Regular Languages, Pumping Lemma for regular Languages . Application of Pumping Lemma, Closure properties of Regular Languages, Decision properties of Regular Languages, FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine, Applications and Limitation of FA.

Unit – III

Context free grammar (CFG) and Context Free Languages (CFL): Definition, Examples, Derivation , Derivation trees, Ambiguity in Grammer, Inherent ambiguity, Ambiguous to Unambiguous CFG, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure proper ties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Memership, Pumping lemma for CFLs.

Unit – IV

Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA

Unit – V

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computerof Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem, Introduction to Undecidability, Undecidable problems about TMs. Post correspondence problem (PCP), Modified PCP, Introduction to recursive function theory

References :

1. Hopcroft, Ullman, "Introduction to Automata Theory,Languages and Computation", Pearson Education . 2. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science : Automata, Languages and Computation", PHI Learning Private Limited, Delhi India. 3.Peter Linz, "An Introduction to Formal Language and Automata", Narosa Publishing house. 4. Y.N.Singh "Mathematical Foundation of Computer Science", New Age International. 5. Papadimitrou, C. and Lewis, C.L., "Elements of the Theory of Computation", PHI Learning Private Limited, Delhi India. 6. K.Krithivasan and R.Rama; Introduction to Formal Languages, Automata Theory and Computation; Pearson Education. 7. Harry R. Lewis and Christos H. Papadimitriou, Elements of the theory of Computation, Second Edition, Prentice-Hall of India Pvt. Ltd. 8. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Learning.

[BTCS-44] COMPUTER GRAPHICS

Course Outcomes-

1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
2. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
3. Use of geometric transformations on graphics objects and their application in composite form.
4. Extract scene with different clipping methods and its transformation to graphics display device.
5. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	3	1	2	1
CO2	1	3	1	2	1
CO3	1	3	1	2	1
CO4	1	3	1	1	1
CO5	3	1	2	1	1

Unit – I

Introduction and Line Generation:Types of computer graphics, Graphic Displays- Random scan displays, Raster scan displays, Frame buffer and video controller, Points and lines, Line drawing algorithms, Circle generating algorithms, Mid pointcircle generating algorithm, and parallel version of these algorithms.

Unit – II

Transformations:Basic transformation, Matrix representations and homogenous coordinates, Composite transformations, Reflections and shearing. Windowing and Clipping: Viewing pipeline, Viewing transformations, 2-D Clipping algorithms- Line clipping algorithms such as Cohen Sutherland line clipping algorithm, Liang Barsky algorithm, Line clipping against non rectangular clip windows; Polygon clipping – Sutherland Hodgeman polygon clipping, Weiler and Atherton polygon clipping, Curve clipping, Text clipping.

Unit – III

Three Dimensional: 3-D geometric primitives, 3-D Object representation, 3-D Transformation, 3-D viewing, projections, 3-D Clipping.

Unit – IV

Curves and Surfaces:Quadric surfaces, Spheres, Ellipsoid, Blobby objects, Introductory concepts of Spline, Bspline and Bezier curves and surfaces. Hidden Lines and Surfaces:Back Face Detection algorithm, Depth buffer method, A- buffer method, Scan line method, basic illumination models– Ambient light, Diffuse reflection, Specular reflection and Phong model, Combined approach, Warn model, Intensity Attenuation, Color consideration, Transparency and Shadows.

References :

1. Donald Hearn and M Pauline Baker, “Computer Graphics C Version”, Pearson Education
2. 2. Amrendra N Sinha and Arun D Udai,” Computer Graphics”, Tata MCGraw Hill.
3. 3. Donald Hearn and M Pauline Baker, “Computer Graphics with OpenGL”, Pearson education
4. 4. R.K. Maurya, “Computer Graphics ” Wiley Dreamtech Publication.
5. 5. Rogers, “ Procedural Elements of Computer Graphics”, McGraw Hill
6. 6. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI Learning Private Limited, Delhi India.

7 Foley, Vandam, Feiner, Hughes – “Computer Graphics principle”, Pearson Education.

8. W. M. Newman, R. F. Sproull – “Principles of Interactive computer Graphics” – Tata MCGraw Hill.

[BTCS-41P] OPERATING SYSTEM LAB

Course Outcomes-

1. The course objectives ensure the development of students applied skills in operating systems related areas.
2. Students will gain knowledge in writing software routines modules or implementing various concepts of operating system.
3. Analyse basic concepts of operating system and their structures.
4. Analyse various issues related to inter process communication like process scheduling, resource management and deadlocks.
5. Interpret the issues and challenges of memory management.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2	3	1	2
CO2	1	2	3	1	2
CO3	1	2	2	1	2
CO4	2	2	1	1	1
CO5	2	2	1	1	1

1.To implement CPU Scheduling Algorithms

- FCFS
- SJF
- SRTF
- PRIORITY
- ROUND ROBIN

2. Simulate all Page Replacement Algorithms • FIFO • LRU

3. Simulate Paging Technique of Memory Management

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

[BTEC-42P] MICROPROCESSOR LAB

Course Outcomes-

1. Understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller.
2. Work with standard microprocessor real time interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital converters.
3. Troubleshoot interactions between software and hardware.
4. Analyze abstract problems and apply a combination of hardware and software to address the problem.
5. Use standard test and measurement equipment to evaluate digital interfaces.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1					
CO2					
CO3					
CO4					
CO5					

1. To study 8085 microprocessor system
2. To study 8086 microprocessor system
3. To develop and run a programme to find out largest and smallest number
4. To develop and run a programme for converting temperature from F to C degree
5. To develop and run a programme to compute square root of a given number
6. To develop and run a programme for computing ascending/descending order of a number.
7. To perform interfacing of RAM chip to 8085/8086
8. To perform interfacing of keyboard controller
9. To perform interfacing of DMA controller
10. To perform interfacing of UART/USART Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

[BTCS-43P] FUNCTIONAL AND LOGIC PROGRAMMING LAB

Course Outcomes-

1. Recollect various programming constructs and to develop C programs.
2. Understand the fundamentals of C programming.
3. Choose the right data representation formats based on the requirements of the problem.
4. Implement different Operations on arrays, functions, pointers, structures, unions and files.
5. Choose most appropriate programming constructs and features to solve the problems in diversified domains.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	1	3
CO2	2	1	3	1	3
CO3	2	1	3	1	3
CO4	2	1	2	2	2
CO5	2	1	2	2	2

Program in SML- NJ or CAML for following:

1. To implement Linear Search
2. To implement Binary Search.
3. To implement Bubble Sorting.
4. To implement Selection Sorting.
5. To implement Insertion Sorting. Implement using LISP
6. Write a function that compute the factorial of a number.(factorial of 0 is 1, and factorial of n is n*(n-1)*...1.Factorial is defined only for integers greater than or equal to 0.)

7. Write a function that evaluate a fully parenthesized infix arithmetic expression . For examples, (infix (1+(2*3))) should return 7. 8. Write a function that perform a depth first traversal of binary tree. The function should return a list containing the tree nodes in the order they were visited.

9. Write a LISP program for water jug problem.
10. Write a LISP program that determines whether an integer is prime.
11. Write a PROLOG program that answers questions about family members and relationships includes predicates and rules which define sister,brother,father,mother,grandchild,grandfather and uncle. The program should be able to answer queries such as the following : o father(x,Amit) o grandson(x,y) o uncle(sumit,puneet) o mother(anita,x)

Note: The Instructor may add/delete/modify/tune experiments, wherever he/shefeels in a justified manner

[BTCS-44P] COMPUTER GRAPHICS LAB

Course Outcomes-

1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
2. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
3. Use of geometric transformations on graphics objects and their application in composite form.
4. Extract scene with different clipping methods and its transformation to graphics display device.
5. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	2	1	2
CO2	2	1	2	1	2
CO3	2	1	2	1	2
CO4	2	1	2	2	1
CO5	2	1	1	3	2

1. To implement DDA algorithms for line and circle.
2. To implement Bresenham's algorithms for line, circle and ellipse drawing
3. To implement Mid Point Circle algorithm using C.
4. To implement Mid Point Ellipse algorithm using C.
5. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.
6. To implement Cohen–Sutherland 2D clipping and window–viewport mapping.
7. To implement Liang Barksy Line Clipping Algorithm.
8. To perform 3D Transformations such as translation, rotation and scaling.
9. To convert between color models.
10. To perform animation using any Animation software
11. To perform basic operations on image using any image editing software
12. To draw different shapes such as hut,face ,kite ,fish etc. Note: The Instructor may add/delete/modify/tune experiments, wherever he/shefeels in a justified manner.

SEMESTER-V

[BTCS-51] Design and Analysis of Algorithms

Course Outcomes-

1. Student should able to distinguish which algorithm is time and space efficient assymptotically.
2. Student should be able to find the space and time efficient sorting and searching strategy.
3. Student should by able to analyze the different design strategy of algorithm.
4. Student should be able to apply a design strategy of algorithm to solve a particular problem.
5. Understanding of NP- Complete and randomized algorithm.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	3		1	1
CO2	1	2	3		1
CO3	1	2	3	2	2
CO4			2		
CO5	1	1		3	1

Unit 1 :

Introduction : Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements, Sorting and order Statistics - Shell sort, Quick sort, Merge sort, Heap sort, Comparison of sorting algorithms, Sorting in linear time.

Unit 2 :

Advanced Data Structures: Red-Black trees, B–trees, Binomial Heaps, Fibonacci Heaps

Unit 3:

Divide and Conquer with examples such as Sorting, Matrix Multiplication, Convex hull and Searching. Greedy methods with examples such as Optimal Reliability Allocation, Knapsack, Minimum Spanning trees – Prim's and Kruskal's algorithms, Single source shortest paths - Dijkstra's and Bellman Ford algorithms.

Unit 4:

Dynamic programming with examples such as Knapsack. All pair shortest paths – Warshal's and Floyd's algorithms, Resource allocation problem Back tracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets.

Unit 5:

Selected Topics: Algebraic Computation, Fast Fourier Transform, String Matching, Theory of NP-completeness, Approximation algorithms and Randomized algorithms.

Text books:

1. Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Algorithms", Printice Hall of India.
2. E. Horowitz & S Sahni, "Fundamentals of Computer Algorithms",
3. Aho, Hopcraft, Ullman, "The Design and Analysis of Computer Algorithms" Pearson Education, 2008.

References:

1. Jon Kleinberg and Éva Tardos, Algorithm Design, Pearson, 2005.
2. Michael T Goodrich and Roberto Tamassia, Algorithm Design: Foundations, Analysis, and

Internet Examples, Second Edition, Wiley, 2006.
3. Harry R. Lewis and Larry Denenberg, Data Structures and Their Algorithms, Harper Collins, 1997
4. Robert Sedgewick and Kevin Wayne, Algorithms, fourth edition, Addison Wesley, 2011.
5. Harsh Bhasin,"Algorithm Design and Analysis",First Edition,Oxford University Press.
6. Gilles Brassard and Paul Bratley,Algorit
hmics:Theory and Practice,Prentice Hall,1995.

[BTCS-52] Database Management System

Course Outcomes-

1. Describe DBMS architecture, physical and logical database designs, database modeling, relational, hierarchical and network models.
2. Identify basic database storage structures and access techniques such as file organizations, indexing methods including B-tree, and hashing.
3. Learn and apply Structured query language (SQL) for database definition and database manipulation.
4. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
5. Understand various transaction processing, concurrency control mechanisms and database protection mechanisms.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1		
CO2	3	2	1		3
CO3		2	2	2	1
CO4	3	2	3		
CO5	3	2			2

Unit 1:

Introduction: An overview of database management system, database system Vs file system, Database system concept and architecture, data model schema and instances, dataindependence and database language and interfaces, data definitions language, DML, OverallDatabase Structure.Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key,Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model,relationship of higher degree.

Unit 2:

Relational data Model and Language: Relational data model concepts, integrity constraints, entity integrity, referential integrity, Keys constraints,Domain constraints, relational algebra, relational calculus, tuple and domain calculus.Introduction on SQL: Characteristics of SQL, advantage of SQL. SQl data type and literals.Types of SQL commands. SQL operators and their procedure. Tables, views and indexes.Queries and sub queries. Aggregate functions. Insert, update and delete operations, Joins,Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL

Unit 3:

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions,normalization using FD, MVD, and JDs, alternative approaches to database design.

Unit 4:

Transaction Processing Concept: Transaction system, Testingof serializability,serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.Distributed Database: distributed data storage, concurrency control, directory system.V. Concurrency Control Techniques: Concurrencycontrol, LockingTechniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction, case study of Oracle.

Text books:

1.Korth, Silbertz, Sudarshan," Database Concepts", McGraw Hill 2.Date C J, " An Introduction to Database Systems", Addision Wesley

3. Elmasri, Navathe, " Fudamentals of Database Systems", Addision Wesley

4. O'Neil, Databases, Elsevier Pub.

References:

1.Leon & Leon,"Database Management Systems", Vikas Publishing House

2.Bipin C. Desai, " An Introduction to Database Systems", Gagotia Publications

3.Majumdar & Bhattacharya, "Database Management System", TMH

[BTCS-53] Principle of Programming Language

Course Outcomes-

1. Knowledge of, and ability to use, language features used in current programming languages.
2. An ability to program in different language paradigms and evaluate their relative benefits.
3. An understanding of the key concepts in the implementation of common features of programming languages.
4. Ability to express syntax and semantics in formal notation.
5. Ability to apply suitable programming paradigm for the application.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	2	3	1	2	1
CO3	3	2	2	2	1
CO4	2	2	1	1	1
CO5	1	2	2		

Unit 1:

The Role of Programming Languages: Why Study Programming Languages,
Towards Higher-Level languages, Programming paradigms, Programming
environmentsLanguage Description: Syntactic structure, language Translation Issues: Programming language Syntax, Stages in translation, Formal translation Models

Unit 2:

Language Properties Modeling Language Properties, Elementary Data Types, Encapsulation,
Inheritance,Sequence Control, Subprogram Control

Unit 3:

Programming Paradigms Imperative Programming: Statements, Types, Procedure Activations Object-Oriented Programming: Grouping Of Data and Operations, object oriented programmingFunctional Programming: Elements, Programming in a Typed language, Programmingwith lists

Unit 4 :

Other Programming Paradigms Logic Programming, Concurrent Programming, Network Programming , LanguageDescription: Semantic Methods

Unit 5:

Lambda Calculus :Introduction to Lambda Calculus, Simple types, Subtyping

Text books:

1. “Programming Languages: Design and Implementations” , Terrance W.Pratt, Marvin V. Zelkowitz, T.V.Gopal,Fourth ed.,Prentice Hall
2. “Programming Language Design Concept”, David A. Watt, Willey India
3. “Programming languages: Concepts and Constucts”, Ravi Sethi, Second Ed.,Pearson.
4. “Types and programming Languages”, Benjamin C. Pierce. The MIT Press Cambridge, Massachusetts London, England

References:

1. Concepts of Programming Languages, Robert W. Sebesta, 10thEd.,Pearson

[BTCS-54] Web Technology

Course Outcomes-

1. Students are able to develop a dynamic webpage by the use of java script and DHTML.
2. Students will be able to write a well formed / valid XML document.
3. Students will be able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
4. Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
5. Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	1	1
CO2	3	1	2	1	1
CO3	3	1	2	1	1
CO4	3	2	1	1	2
CO5	3	2	1	1	

Unit 1:

Introduction and Web Development Strategies, History of Web and Internet,Protocols governing Web, Writing Web Projects, Connecting to Internet,Introduction to Internet services and tools, Introduction to client-servercomputing.Core Java: Introduction, Operator, Data type, Variable, Arrays, Methods &Classes, Inheritance, Package and Interface, Exception Handling, Multithreadprogramming, I/O, Java Applet, String handling, Event handling, Introduction toAWT, AWT controls, Layout managers.

Unit 2:

Web Page Designing:HTML: list, table, images, frames, forms, CSS, Document type definition, XML:DTD, XML schemes, Object Models, presenting and using XML, Using XML
Processors: DOM and SAX, Dynamic HTML.

Unit 3:

Scripting:Java script: Introduction, documents, forms, statements, functions, objects;
introduction to AJAX, VB Script, Introduction to Java Beans, Advantage,Properties, BDK, Introduction to EJB, Java Beans API.

Unit 4:

Server Site Programming:Introduction to active server pages (ASP), Introduction to Java Server Page (JSP), JSP Application Design, JSP objects, Conditional Processing, Declaring
variables and methods, Sharing data between JSP pages, Sharing Session and Application Data, Database Programming using JDBC, development of java beans in JSP, Introduction to Servelets,Lifecycle, JSDK, Servlet API, Servlet Packages, Introduction to COM/DCOM/CORBA.

Unit 5 :

PHP (Hypertext Preprocessor):Introduction, syntax, variables, strings, operators, if-else, loop, switch, array, function, form, mail, file upload, session, error, exception, filter, PHP-ODBC,

Text books:

1.Burdman, Jessica, “Collaborative Web Development” Addison Wesley
2.Xavier, C, “ Web Technology and Design” , New Age International
3.Ivan Bayross,” HTML, DHTML, Java Script, Perl & CGI”, BPB Publication
4.Bhave, “Programming with Java”, Pearson Education
5.Herbert Schieldt, “The Complete Reference:Java”,TMH. 6. Hans Bergsten, “Java Server Pages”,SPD O’Reilly
6.Ullman, “PHP for the Web: Visual QuickStart Guide”, Pearson Education

7.Margaret Levine Young, “The Complete Reference Internet”, TMH
8.Naughton, Schildt, “The Comp
lete Reference JAVA2”, TMH
9.Balagurusamy E, “Programming in JAVA”, TMH

References:

1.Ramesh Bangia, “Internet and Web Design” , New Age International
2.Ivan Bayross,” HTML, DHTML, Java Script, Perl & CGI”, BPB Publication.

[BTCS-55]Computer Architecture

Course Outcomes-

1. Study of the basic structure and operation of a digital computer system.
2. Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floating point arithmetic operations.
3. Implementation of control unit techniques and the concept of Pipelining.
4. Understanding the hierarchical memory system, cache memories and virtual memory.
5. Understanding the different ways of communicating with I/O devices and standard I/O interfaces.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1
CO2	2	2	2	1	1
CO3	2	3	2	2	1
CO4	2	2	2	2	1
CO5	2	1	2	2	2

Unit 1:

Introduction: Digital computer generation, computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer. Central Processing Unit: Addition and subtraction of signed numbers, look ahead carry adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation Processor organization, general register organization, stack organization and addressing modes.

Unit 2:

Control Unit: Instruction types, formats, instruction cycles and subcycles (fetch and execute etc) , micro-operations, execution of a complete instruction. Hardwire and microprogrammed control: microprogramme sequencing, wide branch addressing, microinstruction with next address field, pre-fetching microinstructions, concept of horizontal and vertical microprogramming.

Unit 3 :

Memory: Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories. Cache memories: concept and design issues 9 performance, address mapping and replacement) Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.

Unit 4 :

Input / Output: Peripheral devices, I/O interface,I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed

Unit 5 :

I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.

TEXT BOOK:

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", Sixth Edition, Pearson Education, 2003.

REFRENCE BOOKS:-

1. Patterson, Computer Organisation and Design, Elsevier Pub. 2009
2. Vravice,Hamacher & Zaky, "Computer Organization", TMH
3. Mano," Computer System Architecture", PHI
4. John P Hays, " Computer Organization", McGraw Hill
5. Tannenbaum," Structured Computer Organization', PHI 6. P Pal chaudhry, ' Computer Organization & Design', PHI

[BTMB-51] Engineering Economics

Course Outcomes-

1. calculate the value of money according to time.
2. compares single payment at present with single payment in the future.
3. compares single payment in the future with annual payment.
4. compares single payment at present with annual payment.
5. calculates the value of money using arithmetic and geometric gradients.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	1
CO2	3	2	1	2	1
CO3	3	2	1	2	1
CO4	3	2	2	2	1
CO5	3	2	2	1	2

Unit-1 Introduction to Engineering Economics and Managerial Economics Concept of Efficiency, Theory of Demand , Elasticity of Demand, Supply and Law of Supply indifference Curves, Budget Line, Welfare Analysis, Scope of Managerial Economics, Techniques and Applications of Managerial Economics.

Unit-2 Market Structure Perfect Competitions Imperfect- Monopolistic, Oligopoly, duopoly sorbent features of price determination and various market conditions.

Unit-3 Demand Forecasting and cost Estimation Characteristics of Forecasts, Forecasting Horizons, Steps to Forecasting, Forecasting Methods, Seasonal Adjustments, Forecasting Performance Measures, Cost Estimation, Elements of cost, Computation of Material Variances Break-Even Analysis.

Unit-4 Management Aspects Functions of Management, Project Management, Value Engineering, Project Evaluation, Decision Making.

[BTCS-51P] Design and analysis of algorithms Lab

Course Outcomes-

1. Design algorithms using divide and conquer, greedy and dynamic programming.
2. Execute sorting algorithms such as sorting, graph related and combinatorial algorithm in a high level language.
3. Analyze the performance of merge sort and quick sort algorithms using divide and conquer technique.
4. Apply the dynamic programming technique to solve real world problems such as knapsack and TSP.
5. Analyze the asymptotic performance of algorithms.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1
CO2	3	2	3	2	1
CO3	3	2	3	2	1
CO4	3	3	2	2	2
CO5	2	3	2	2	2

Objective :-

1. Program for Recursive Binary & Linear Search.
2. Program for Heap Sort.
3. Program for Merge Sort.
4. Program for Selection Sort.
5. Program for Insertion Sort.
6. Program for Quick Sort.
7. Study of NP-Complete theory.
8. Study of Cook's theorem.
9. Study of Sorting network.

[BTCS-52P] DBMS Lab

Course Outcomes-

1. Students get practical knowledge on designing and creating relational database systems.
2. Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL.
3. Use of various software to design and build ER Diagrams, UML, Flow chart for related database systems.
4. Students will be able to design and implement database applications on their own.
5. Ability to formulate queries using SQL DML/DDL/DCL commands.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	1
CO2	3	2	1	2	1
CO3	33	2	11	2	1
CO4	3	2	1	2	1
CO5	3	2	2	2	3

Objectives:-

1. Installing oracle.
2. Creating Entity-Relationship Diagram using case tools.
3. Writing SQL statements Using ORACLE /MYSQL: a)Writing basic SQL SELECT statements. b)Restricting and sorting data. c)Displaying data from multiple tables. d)Aggregating data using group function. e)Manipulating data. e)Creating and managing tables.
4. Normalization in ORACLE.
5. Creating cursor in oracle.
6. Creating procedure and functions in oracle.
7. Creating packages and triggers in oracle.

[BTCS-53P] Principles of programming languages Lab

Course Outcomes-

1. Knowledge of, and ability to use, language features used in current programming languages.
2. An ability to program in different language paradigms and evaluate their relative benefits.
3. An understanding of the key concepts in the implementation of common features of programming languages.
4. Develop, analyze, and compare programs written in the various Programming Paradigms.
5. Choose an appropriate programming language solution for a given programming task.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	1	1
CO2	2	2	3	2	1
CO3	2	2	3	1	1
CO4	2	1	2	2	1
CO5	2	1	2	2	2

1. Define a LISP function to compute sum of squares.
2. Define a LISP function to compute difference of squares. (if x > y return x
2
-y
2
, otherwise y
2
- x
2
)
3. Define a Recursive LISP function to solve Ackermann's Function.
4. Define a Recursive LISP function to compute factorial of a given number.
5. Define a Recursive LISP function which takes one argument as a list and returns last element of the list. (do not use last predicate)
6. Define a Recursive LISP function which takes one argument as a list and returns a list except last element of the list. (do not use but last predicate)
7. Define a Recursive LISP function which takes one argument as a list and returns reverse of the list. (do not use reverse predicate)
8. Define a Recursive LISP function which takes two arguments first, an atom, second, a list, returns a list after removing first occurrence of that atom within the list.

[BTCS-54P] Web Technology Lab

Course Outcomes-

1. Develop web pages using HTML, DHTML and Cascading Styles sheets
2. Develop web pages using HTML, DHTML and Cascading Styles sheets.
3. Develop a dynamic web pages using JavaScript (client side programming).
4. Develop an interactive web applications using ASP.NET.
5. Build and consume web services.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1
CO2	3	3	2	2	1
CO3	3	3	2	2	1
CO4	3	2	2	2	3
CO5	3	2	3	2	3

Objectives:-

1. Write HTML/Java scripts to display your CV in navigator, your Institute website, Department Website and Tutorial website for specific subject
2. Design HTML form for keeping student record and validate it using Java script.
3. Write an HTML program to design an entry form of student details and send it to store at database server like SQL, Oracle or MS Access.
4. Write programs using Java script for Web Page to display browsers information.
5. Write a Java applet to display the Application Program screen i.e. calculator and other.
6. Writing program in XML for creation of DTD, which specifies set of rules. Create a style sheet in CSS/ XSL & display the document in internet explorer.
7. Using ASP for server side programming, ASP for user name and password and to retrieve & match the value. It display success and failure messages. ASP for creating text file local drive, ASP for keeping the student record in database.
8. Program to illustrate JDBC connectivity. Program for maintaining database by sending queries. Design and implement a simple servlet book query with the help of JDBC & SQL. Create MS Access Database, Create on ODBC link, Compile & execute JAVA JDVC Socket.
9. Design and implement a simple shopping cart example with session tracking API.

SEMESTER-VI

[BTCS-61] Computer Networks

Course outcomes-

1. Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission.
2. Apply channel allocation, framing, error and flow control techniques.
3. Describe the functions of Network Layer i.e. logical addressing, sub netting & Routing Mechanism.
4. Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.
5. Explain the functions offered by session and presentation layer and their Implementation.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2
CO2	3	2	3	2	2
CO3	3	2	2	2	1
CO4	3	2	2	1	1
CO5	3	2	2	1	1

Unit 1 :

Introduction on Concepts: Goals and Applications of Network, Network structure and architecture, The OSI reference model, services, Network Topology Design – Delay Analysis, Back Bone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.

Unit 2:

Medium Access sublayer: Medium Access sublayer –Channel All locations, LAN protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer -Elementary Data Link Protocols, Sliding Window protocols, Error Handling.

Unit 3:

Network Layer: Network Layer - Point - to Pont Networks, routing, Congestion control Internetworking -TCP / IP, IP packet, IP address, IPv6.

Unit 4 :

Transport Layer: Transport Layer - Design issues, connection management, session Layer-Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP - Window Management.

Unit 5 :

Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application.Example Networks - Internet and Public Networks.

TEXTBOOKS:

1. Forouzen, "Data Communication and Networking", TMH
2. A.S. Tanenbaum, Computer Networks, Pearson Education
3. W. Stallings, Data and Computer Communication, Macmillan Press

REFRENCES:

1. Anuranjan Misra, “Computer Networks”, Acme Learning
2. G. Shanmugarathinam, ”Essential of TCP/ IP”, Firewall Media

[BTCS-62] Software Engineering

Course Outcomes-

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Ability to apply software engineering principles and techniques.
3. Ability to develop, maintain and evaluate large-scale software systems.
4. To produce efficient, reliable, robust and cost-effective software solutions.
5. Ability to perform independent research and analysis.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1		1	1
CO2	2	2	2	1	
CO3		2	2		2
CO4	2	1	2	3	1
CO5	1	2	3		1

Unit 1:

Introduction:Introduction to Software Engineering, Software Components,
Software Characteristics, Software Crisis, Software Engineering Processes,Similarity and Differences from Conventional Engineering Processes,Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

Unit 2 :

Software Requirement Specifications (SRS) Requirement Engineering Process: Elicitation, Analysis, Documentation,Review and Management of User Needs, Feasibility Study, InformationModeling, Data Flow Diagrams, Entity Relationship Diagrams, DecisionTables, SRS Document, IEEE Standards for SRS.Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model.

Unit 3 :

Software Design:Basic Concept of Software Design, Architectural Design,Low Level Design: Modularization,Design Structure Charts, PseudoCodes, Flow Charts, Coupling and Cohes ion Measures, Design Strategies:Function Oriented Design, Object
Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Halestead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.

Unit 4 :

Software Testing:Testing Objectives, Unit Testing, Integration Testing,Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing Strategies:Test Drivers and Test Stubs, Structural Testing
(White Box Testing),Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing of Products.Static Testing Strategies: Formal Technical
Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards.

Unit 5 :

Software Maintenance and Software Project Management,Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various

Textbooks:

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. K. K. Aggarwal and Yogesh Singh, Software Engineering, New
Age International Publishers.
4. Pankaj Jalote, Software Engineering, Wiley
5.Deepak Jain,"Software Engineering:Principles and Practices",Oxford University Press.

[BTCS-63] Compiler Design

Course Outcomes-

1. Discuss the major phases of compilers and use the knowledge of the Lex tool.
2. Develop the parsers and experiment with the knowledge of different parsers design without automated tools.
3. Describe intermediate code representations using syntax trees and DAG's as well as use this knowledge to generate intermediate code in the form of three address code representations.
4. Classify various storage allocation strategies and explain various data structures used in symbol tables
5. Summarize various optimization techniques used for dataflow analysis and generate machine code from the source code of a novel language.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3			2	
CO2		3			3
CO3		3	1	2	1
CO4	3		1	3	
CO5	3	1		2	

Unit 1:

Introduction to Compiler, Phases andpasses, Bootstrapping, Finite state machines and regular expressions and their applications tolexical analysis, Optimization of DFA
-Based Pattern Matchers implementation of lexical analyzers, lexical-analyzer generator, LEX-compiler, Formal grammars and their application to syntax analysis,
BNF notation, ambiguity, YACC. The syntactic specification of programming languages: Context free grammars, derivation and parse trees, capabilities of CFG.

Unit 2:

Basic ParsingTechniques: Parsers, Shiftreduce Parsing, operator precedence parsing, top down parsing, predictive parsers Automatic Construction of efficient Parsers: LR parsers, the canonical Collection of LR(0)

items, constructing SLR parsing tables,constructing Canonical LR parsing tables, Constructing LALR parsing tables, using ambiguous grammars, an automatic parser generator, implementation of LR parsing tables.

Unit 3:

Syntax-directed Translation: Syntax-directed Translation schemes,Implementation of Syntax-directed Translators, Intermediate code, postfix notation, Parse trees & syntax trees, three address code,quadruple & triples, translation of assignment statements, Boolean expressions, statements that alter the flow of control, postfix translation, translation with
a top down parser

Unit 4:

Symbol Tables: Data structure for symbols tables, representingscope8information. Run-Time Administration: Implementation of simple stack allocation scheme, storage allocation in block structured language. Error Detection & Recovery: Lexical Phase errors, syntactic phase errors semantic errors. VCode Generation: Design Issues, the Target Language. Addresses
in the Target Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, Code Generator. Code optimization: Machine-Independent Optimizations, Loop optimization, DAG representation of basic blocks,.

Textbooks:

1. Aho, Sethi & Ullman, "Compilers: Principles, Techniques and Tools", Pearson Education
2. V Raghvan, " Principles of Compiler Design", TMH
3. Kenneth Louden," Compiler Construction", Cengage Learning.
4. Charles Fischer and Ricard LeBlanc," Crafting a Compiler with C", Pearson Education

Refrences:

1.K. Muneeswaran,Compiler Design,First Edition,Oxford University Press.
2.J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, TataMcGraw-Hill,2003.

[BTCS-64] Concurrent Systems

Course Outcomes-

1. Discuss issues involved in synchronization, mutual exclusion, deadlock and liveness.
2. 2Design concurrent programs using various kinds of process interaction such as semaphores, monitors and message passing.
3. Write concurrent (threaded) programs in Java.
4. understand the difference between shared-memory concurrency and distributed systems.
5. understand the fundamental properties of distributed systems and their implications for system design.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	
CO2		3			1
CO3	2	2	1	2	1
CO4	2		1	3	2
CO5	3	1	2	2	1

Unit 1:

Introduction to concurrent systems and Formal Methods: Reactive systems, Formal methods for reactive systems, Labeled transition systems, Operational semantics for concurrent processes.

Unit 2:

Process Algebras: Operators for process modeling, CCS, CSP, Pi-calculus

Unit 3:

Asynchronous Pi Calculus

Unit 4 :

Distributed Pi Calculus, Introduction to type systems

Unit 5:

Tools and Techniques: Experimental practice on mobility workbench (MBW), concurrency workbench (CWB-NC), CTMC.

References:

1. Robin Milner: Communicating and mobile systems: The π-Calculus,Cambridge University Press, 1999

2. Matthew Hennessy: A distributed Pi-Calculus, Cambridge University Press, 20

[BTCS-65] E-Commerce

Course Outcomes-

1. Analyze the impact of E-commerce on business models and strategy.
2. Describe the major types of E-commerce.
3. Explain the process that should be followed in building an E-commerce presence.
4. Identify the key security threats in the E-commerce environment.
5. Describe how procurement and supply chains relate to B2B E-commerce.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	1	1
CO2	2	2	2		2
CO3	2	2	1	2	
CO4	2	1	2	2	1
CO5	1			1	2

Unit 1:

Introduction: Definition of Electronic Commerce, E-Commerce: technology and prospects, incentives for engaging in electronic commerce, needs of E-Commerce, advantages and disadvantages, framework, Impact of E-commerce on business, E-Commerce Models.

Unit 2:

Network Infrastructure for E- Commerce: Internet and Intranet based E-commerce- Issues, problems and prospects, Network Infrastructure, Network Access Equipment. Broadband telecommunication (ATM, ISDN, FRAME RELAY).Mobile Commerce: Introduction, Wireless Application Protocol, WAP technology, Mobile Information device.

Unit 3:

Web Security: Security issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network Security, Factors to consider in Firewall design, Limitation of Firewalls.

Unit 4:

Encryption: Encryption techniques, Symmetric Encryption: Keys and data encryption standard, Triple encryption, Secret key encryption; Asymmetric encryption: public and private pair key encryption, Digital Signatures, Virtual Private Network.

Unit 5:

Electronic Payments: Overview, The SET protocol, Payment Gateway, certificate, digital Tokens, Smart card, credit card,magnetic strip card, E-Checks, Credit/Debit card based EPS, online

Text Books:

1. Ravi Kalakota, Andrew Winston, “Frontiers of Electronic Commerce”, Addison-Wesley.
2. Pete Lohsin , John Vacca “Electronic Commerce”, New Age International 3. Goel, Ritendra “E-commerce”, New Age International
4. Laudon, “E-Commerce: Business, Technology, Society”, Pearson Education

[BTMB-61] INDUSTRIAL MANAGEMENT

Course Outcomes-

1. Understand the concepts related to Business.
2. Demonstrate the roles, skills and functions of management.
3. Analyze effective application of PPM knowledge to diagnose and solve organizational problems and
4. develop optimal managerial decisions.
5. Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1	1	1	
CO2	1	2	1	1	2
CO3	2	2	2		1
CO4	3	2	2	2	1
CO5			2	2	

Unit-I Introduction: Concept, Development, application and scope of Industrial Management. Productivity: Definition, measurement, productivity index, types of production system, Industrial Ownership.

Unit-II Management Function: Principle of Management – Time and motion study, work simplification – process charts and flow diagrams, Production Planning.

Unit-III Inventory Control: Inventory, Cost, Deterministic Models, Introduction to supply chain management.

Unit-IV Quality Control: Process control, SQC, Control charts, Single, Double and Sequential Sampling, Introduction to TQM.

[BTCS-61P] Computer Networks Lab

Course Outcomes-

1. Identify and use various networking components Understand different transmission media and design cables for establishing a networks.
2. Implement any topology using network devices.
3. Analyze performance of various communication protocols.
4. Compare routing algorithms.
5. Understand the TCP/IP configuration for Windows and Linux.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2		
CO2	2			2	1
CO3	1	1	2	2	
CO4	2	1	3	1	2
CO5		1	1	1	2

Implement device sharing on network

1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols.

[BTCS-62P] Software Engineering Lab

Course Outcomes-

1. Able to prepare SRS document, design document, test cases and software configuration management and risk management related document.
2. Develop function oriented and object oriented software design using tools like rational rose.
3. Able to perform unit testing and integration testing.
4. Apply various white box and black box testing techniques.
5. Able to track the progress of a project using Open project tool.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	2	2	2	1
CO2	2		1	2	1
CO3	3	2	1	1	1
CO4	2	1	2		2
CO5	1	1	1	1	3

For any given case/ problem statement do the following;

1. Prepare a SRS document in line with the IEEE recommended standards.
2. Draw the use case diagram and specify the role of each of the actors. Also state the precondition, post condition and function of each use case.
3. Draw the activity diagram.
4. Identify the classes. Classify themas weak and strong classes and draw the class diagram.
5. Draw the sequence diagram for any two scenarios.
6. Draw the collaboration diagram.
7. Draw the state chart diagram.
8. Draw the component diagram.
9. Perform forward engineering in java.(Model to code conversion)
10. Perform reverse engineering in java.(Code to Model conversion)
11. Draw the deployment diagram.

[BTCS-63P] Compiler Design Lab

Course Outcomes-

1. Design Lexical analyzer for given language using C and LEX tools.
2. Design and convert BNF rules into YACC form to generate various parsers.
3. Generate machine code from the intermediate code forms.
4. Implement Symbol table.
5. Develop the parsers and experiment with the knowledge of different parsers design without automated tools.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1		2			1
CO2	2	2	2	2	3
CO3	3		3	2	3
CO4	3	2	3		3
CO5	1	2	3		3

1. Implementation of LEXICAL ANALYZER for IF STATEMENT
2. Implementation of LEXICAL ANALYZER for ARITHMETIC EXPRESSION
3. Construction of NFA from REGULAR EXPRESSION
4. Construction of DFA from NFA
5. Implementation of SHIFT REDUCE PARSING ALGORITHM
6. Implementation of OPERAT OR PRECEDENCE PARSER
7. Implementation of RECURSIVE DESCENT PARSER
8. Implementation of CODE OPTIMIZATION TECHNIQUES
9. Implementation ofCODE GENERATOR

SEMESTER- VII

[BTOE-71] QUALITY MANAGEMENT

Course Outcomes-

1. To realize the importance of significance of quality
2. Manage quality improvement teams
3. Identify requirements of quality improvement programs
4. Identify the elements that are part of the quality measuring process in the industry.
5. Predict the errors in the measuring process, distinguishing its nature and the root causes.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	1	3	1	1	1
CO2	1	2	2	1	1
CO3	2	2			
CO4	1	1	1	1	1
CO5	2	1		2	2

UNIT-I

Quality Concepts: Evolution of Quality Control, concept change, TQM Modern concept, Quality concept in design, Review of design, Evolution of proto type. Control on Purchased Product Procurement of various products, evaluation of supplies, capacity verification, Development of sources, procurement procedure. Manufacturing Quality Methods and techniques for manufacture

UNIT-II

Quality Management Organization structure and design, quality function, decentralization, designing and fitting, organization for different type products and company, economics of quality value and contribution, quality cost, optimizing quality cost, seduction program. Human Factor in quality Attitude of top management, cooperation of groups

UNIT-III

Control Charts Theory of control charts, measurement range, construction and analysis of R charts, process capability study, use of control charts. Attributes of Control Chart Defects, construction and analysis of charts, improvement by control chart, variable sample size, construction and analysis of C charts.

UNIT -IV

Defects diagnosis and prevention defect study, identification and analysis of defects, correcting measure, factors affecting reliability, MTTF, calculation of reliability, building reliability in the product, evaluation of reliability, interpretation of test results, reliability control, maintainability, zero defects, quality circle.

UNIT –V

ISO-9000 and its concept of Quality Management7, ISO 9000 series, Taguchi method, JIT in some details.

REFERENCE :

1. Lt. Gen. H. Lal, “Total Quality Management”, Eastern Limited, 1990.
2. Greg Bounds, “Beyond Total Quality Management”, McGraw Hill, 1994.
3. Menon, H.G, “TQM in New Product manufacturing”, McGraw Hill 1992.

[BTCS-71] DISTRIBUTED SYSTEMS

Course Outcomes-

1. To provide hardware and software issues in modern distributed systems.
2. To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
3. To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analysed.
4. To know about Shared Memory Techniques.
5. Have Sufficient knowledge about file access.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	1	
CO2	3	2	2	1	
CO3	3	2	2	2	2
CO4	3	2	3		
CO5	3	3	2	1	2

Unit–I

Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. Architectural models, Fundamental Models.
Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock,
shared memory, Logical clocks , Lamport's& vectors logical clocks. Concepts in Message Passing Systems: causal order, total order, total causal order, Techniques for Message Ordering,

Unit-II

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms. Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection,
distributed dead lock detection

Unit–III

Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database System .Distributed Resource Management: Issues in distributed File Systems, Mechanism for building distributed file systems,

Unit–IV

Failure Recovery in Distributed Systems: Concepts in Backward and Forward recovery, Recovery in Concurrent systems, Obtaining consistent Checkpoints, Recovery in Distributed Database Systems. Fault Tolerance: Issues in Fault Tolerance, Commit Protocols, Voting protocols, Dynamic voting protocols.

Unit –V

Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication,

REFERENCES:

1.Singhal&Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
2.Ramakrishna,Gehrke," Database Management Systems", McGraw Hill
3.Vijay K.Garg Elements of Distributed Computing , Wiley

[BTCS-72] ARTIFICIAL INTELLIGENCE

Course Outcomes-

1. Analyze the implications of applying AI systems to organizations and future of work.
2. Explain how to develop AI systems to meet business, organizational, and technology requirements.
3. Implement AI frameworks and platforms to improve business, organizational, and technology outcomes.
4. Develop bots to automate organizational processes from end to end.
5. Create organizational intelligence using a holistic approach to enterprise systems based on business, organizational, and technology requirements.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2	1	2	2
CO2	2	2	1		1
CO3	2	2	1	2	1
CO4	2	2	1	1	1
CO5	2	2	1	1	1

Unit-I

Introduction : Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.

Unit-II

Introduction to Search : Searching for solutions, Uniformed search strategies, Informed search strategies,

Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha -Beta pruning.

Unit-III

Knowledge Representation & Reasoning: Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

Unit-IV

Machine Learning : Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data

[BTCS-73] ANDROID OPERATING SYSTEM

Course Outcomes-

1. Understand Android OS, gradle, Android Studio.
2. Debug Android Application
3. Develop UI based Mobile Application using Android Studio.
4. Design application for Mobile using various sensors.
5. Design and develop an application using Database.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	1	2
CO2	3			3	
CO3	1	3	2	3	3
CO4	2	1	2		3
CO5	2		3	1	

UNIT I

Android OS Android Software Stack, Activities and Applications, Activity Life Cycles, Activity Stacks, Activity States, Resources, Android OS vs. IOS

UNIT II

User Interfaces Views, Layouts, Android Widgets, UI XML Specifications, Explicit Intents, Implicit Intents, Event Broadcasting with Intents, Event Reception with Broadcast Receivers, Adapters and Data Binding.

UNIT III

Multimedia ,Audio, Video, Camera, Playing Audio and Video, Recording Audio and Video, Using the Camera to Take and Process Pictures

UNIT IV

Networking Internet Access, HTML and XML Parsing, Wi-Fi

UNIT V

Touch screen Capturing Touch Events, Touch screen Gesture Recognition

REFERENCE:

1.Rito Meier. "Professional Android 2 Application Development." Wiley Publishing, Inc.
2.SayedHashimi, Satya Komatineni, Dave MacLean. "Pro Android 2." APRESS.
3.Mark Murphy. "Beginning Android 2." APRESS.
4.Carmen Delessio, Lauren Darcey ”Android Application Development” Pearson.

[BTCS-74] CRYPTOGRAPHY & NETWORK SECURITY

Course Outcomes-

1. Analyze and design classical encryption techniques and block ciphers.
2. Understand and analyze data encryption standard.
3. Understand and analyze public-key cryptography, RSA and other
4. public-key cryptosystems such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc.
5. Understand key management and distribution schemes and design User Authentication

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3		2		1
CO2	2	1	3	2	2
CO3	2	3	2		2
CO4	2	3	3	2	2
CO5		2		1	2

Unit-I

Introduction to security attacks, services and mechanism, Classical encryption techniques-substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard(DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES

Unit-II

Introduction to group, field, finite field of the form GF(p), modular arithmetic, prime and relative prime numbers, Advanced Encryption Standard (AES) encryption and decryption Fermat's and Euler's theorem, Primarily testing, Chinese Remainder theorem , Principals of public key crypto systems, RSA algorithm, security of RSA

Unit-III

Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions, Secure hash algorithm (SHA)Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm,

UNIT IV

Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, X.509 Certificates, Public key Infrastructure .Authentication Applications: Kerberos, Electronic mail security: pretty good privacy (PGP), S/MIME.

Unit-V

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management .Introduction to Secure Socket Layer, Secure electronic, transaction (SET)System Security: Introductory idea of Intrusion, Intrusion detection, Viruses and related threats, firewalls.

REFERENCES:

1.William Stallings, "Cryptography and Network Security: Principals and Practice", Pearson Education.
2.Behrouz A. Frouzan: Cryptography and Network Security, Tata McGraw Hill
3.C K Shyamala, N Harini, Dr. T.R.Padmnabhan Cryptography and Security ,Wiley
4.Bruce Schiener, "Applied Cryptography". John Wiley & Sons
5.Bernard Menezes," Network Security and Cryptography", Cengage Learning.
6.AtulKahate, "Cryptography and Network Security", Tata McGraw Hill.

[BTCS-71P] DISTRIBUTED SYSTEM LAB

Course Outcomes-

1. Verify and analyze the time complexity of the algorithms related to distributed computing.
2. Design and develop various algorithms for problems in distributed computing.
3. Compare various resource allocation strategies.
4. To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
5. To analyse the current popular distributed systems such as peer-to-peer (P2P) systems will also be analysed.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1		3	1
CO2	3	1	1	2	
CO3	2	1	3	2	1
CO4	2	1		2	
CO5		2	1	2	1

The following programs maybe developed preferably on 'UNIX' platform:-A part from the above other problems may be given as per Course Instructor.

1. Simulate the functioning of Lamport's Logical Clock in 'C'.
2. Simulate the Distributed Mutual Exclusion in 'C'.
3. Implement a Distributed Chat Server using TCP Sockets in 'C'.
4. Implement RPC mechanism for a file transfer across a network in 'C'
5. Implement 'Java RMI' mechanism for accessing methods of remote systems.
6. Simulate Balanced Sliding Window Protocol in 'C'.
7. Implement CORBA mechanism by using 'C++' program at one end and 'Java program on the other.

SEMESTER- VIII

[BTOE-81] NON-CONVENTIONAL ENERGY RESOURCES

Course Outcomes-

1. Demonstrate the generation of electricity from variousNon-Conventional sources of energy, have a working knowledge on types of fuel cells.
2. Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation.
3. Explore the concepts involved in wind energy conversion system by studying its components, types and performance.
4. Illustrate ocean energy and explain the operational methods of their utilization.
5. Acquire the knowledge on geothermal energy.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	2	1		1	1
CO2	1	3	3	2	1
CO3	3	1	2	1	1
CO4	2	1	2	1	
CO5	2		1	2	1

UNIT-I

Introduction Various non-conventional energy resources-Introduction, availability, classification, relative merits and demerits. 3Solar Cells: Theory of solar cells. solar cell materials, solar cell array, solar cell power plant, limitations.

UNIT-II

Solar Thermal Energy: Solar radiation, flat plate collectors and their materials, applications and performance, focusing of collectors and their materials, applications and performance; solar thermal power plants,
thermal energy storage for solar heating and cooling, limitations.

UNIT-III

Geothermal Energy: Resources of geothermal energy, thermodynamics of geo-thermal energy conversion-electrical conversion, non-electrical conversion, environmental considerations.
4Magneto-hydrodynamics (MHD):Principle of working of MHD Power plant, performance and limitations.
Fuel Cells: Principle of working of various types of fuel cells and their working, performance and limitations

UNIT-IV

Thermo-electrical and thermionic Conversions: Principle of working, performance and limitations.
Wind Energy: Wind power and its sources, site selection, criterion, momentum theory, classification of rotors, concentrations and augments, wind characteristics. performance and limitations of energy conversion systems.

UNIT-V

Bio-mass:Availability of bio-mass and its conversion theory. 2 Ocean Thermal Energy Conversion (OTEC):Availability, theory and working principle, performance and limitations.
Wave and Tidal Wave: Principle of working, performance and limitations. Waste Recycling Plants.

Text/References Books:

1. Raja etal, "Introduction to Non-Conventional Energy Resources" Scitech Publications.
2. John Twideu and Tony Weir, "Renewal Energy Resources" BSP Publications, 2006.
3. M.V.R. Koteswara Rao, " Energy Resources: Conventional & Non-Conventional " BSP Publications,2006.
4. D.S. Chauhan,"Non-conventional Energy Resources" New Age International.

[BTCS-81] Digital Image Processing

Course Outcomes-

1. Understand the need for image transforms different types of image transforms and their properties.
2. develop any image processing application.
3. understand the rapid advances in Machine vision.
4. learn different techniques employed for the enhancement of images.
5. learn different causes for image degradation and overview of image restoration techniques.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3
CO2	3	1		2	3
CO3	3	1	2	2	3
CO4	3	2	2	2	3
CO5	3	2		2	3

UNIT-I

Introduction and Fundamentals, Motivation and Perspective, Applications, Components of Image Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization. Basis of Filtering in Frequency Domain, Filters – Low-pass, High-pass; Correspondence Between Filtering in Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Low pass Filters; Sharpening Frequency Domain Filters – Gaussian High pass Filters.

UNIT-II

Image Enhancement in Spatial Domain Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image

Subtraction, Image Averaging; Basics of Spatial Filtering, Smoothing - Mean filter, Ordered Statistic Filter;

UNIT-III

Image Restoration: A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters
– Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering – Band pass Filters; Minimum Mean-square Error Restoration.

UNIT-IV

Morphological Image Processing Introduction, Logic Operations involving Binary Images, Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening

UNIT-V

Registration Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging – Algorithms to Establish Correspondence, Algorithms to Recover Depth
Segmentation Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge Operators, Pattern Fitting Approach

REFERENCES:

1.Digital Image Processing 2nd Edition, Rafael C. Gonzalvez and Richard E. Woods. Published by: Pearson Education.
2.Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY.
3.Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall, Upper Saddle River, NJ.
4.Sonka,Digital Image Processing and Computer Vision, Cengage Learning
5.Gonzalez and Woods, Digital Image Processing, Addison Wesley

[BTCS-82] REAL TIME SYSTEM

Course Outcomes-

1. Understand concepts of Real-Time systems and modeling
2. Recognize the characteristics of a real-time system
3. Understand and develop document on an architectural design of a real-time system.
4. Develop and document Task scheduling, resource management, real-time operating systems and fault tolerant applications of Real-Time Systems.
5. develop an understanding of various Real Time systems Application.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	
CO2	1	1	1	1	1
CO3	1	1	2	2	1
CO4	2	2		2	1
CO5	1	2	2	1	2

UNIT-I

Introduction - Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model.

UNIT-II

Real Time Scheduling Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective
-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Rate Monotonic Algorithm, Offline Versus Online Scheduling Systems.

UNIT-III

Resources Sharing Effect of Resource Contention and Resource Access Control (RAC), Non
-preemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority
-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources,

UNIT-IV

Real Time Communication Basic Concepts in Real time Communication, Soft and Hard RT Communication systems, Model of Real Time Communication, Priority-Based Service and Weighted Round-
Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks

UNIT-V

Real Time Operating Systems and Databases Features of RTOS, Time Services, UNIX as RTOS, POSIX Issues, Characteristic of Temporal data, Temporal Consistency, Concurrency Control, Overview of Commercial Real Time databases

REFERENCES:

1.Real Time Systems by Jane W. S. Liu, Pearson Education Publication.
2.Phillip A Laplanta, Seppo J. Ovaska Real time System Design and Analysis Tools for practitioner, Wiley
3.Mall Rajib, “Real Time Systems”, Pearson Education

[BTCS-83] EMBEDDED SYSTEMS

Course Outcomes-

1. To introduce the Building Blocks of Embedded System
2. To Educate in Various Embedded Development Strategies
3. To Introduce Bus Communication in processors, Input/output interfacing.
4. To impart knowledge in various processor scheduling algorithms.
5. To introduce Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	1		3	1
CO2	1	2	1	1	1
CO3		1	3	2	2
CO4		1	2	1	
CO5	2	1	1		1

Unit-I

Introduction to embedded systems: Classification, Characteristics and requirements, Applications

Unit-II

Timing and clocks in Embedded systems, Task Modeling and management, Real time operating system issues.

Unit-III

Signals, frequency spectrum and sampling, digitization (ADC, DAC), Signal Conditioning Processing. Modeling and Characterization of Embedded Computation System.

Unit-IV

Embedded Control and Control Hierarchy, Communication strategies for embedded systems: Encoding and Flow control.

Unit-V

Fault-Tolerance, Formal Verification , Trends in Embedded Processor, OS, Development Language

References:

1.Prasad, Embedded /Real Time System, Concept, Design and Programming Black Book, Wiley India
2.R.Gupta, “Co-synthesis of Hardware and Software for Embedded Systems”, Kluwer
3.Shibu K.V., “Introduction to Embedded Systems”, TMH
4.Marwedel, “Embedded System Design”, Springer.

[BTCS-81P] Seminar

Course Outcomes-

1. Identify emerging technologies/current trends to gather relevant information through independent or collaborative study.
2. Analyze and Summarize related work and literature in the identified field of study.
3. Design a clear, well-constructed document that represents both technical and non-technical information using engineering-standard figures, reports and drawings.
4. Demonstrate effective oral presentations in given time constraints, using a variety of presentation media.
5. Develop the listening skills and comprehend information, instructions, and viewpoints either as a presenter or as an audience

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	2	1
CO2	1	2	1	2	1
CO3	2	1	1	2	1
CO4	1	2		1	
CO5	2		1	2	1

[BTCS-82P] Project

Course Outcomes-

1. Competence in applying the software engineering principles in planning, formulating an innovative design/ approach and computing the requirements appropriate to solve the problem within the context of legal, global and environment constraint.
2. Capability to develop/implement the design with appropriate techniques, resources and contemporary tools exhibiting integrity and ethical behavior in engineering practice.
3. Capability to develop/implement the design with appropriate techniques, resources and contemporary tools exhibiting integrity and ethical behavior in engineering practice.
4. Ability to test and defend performance of the implemented project and understand the Implication of the solution.
5. Ability to use formal and informal Communication with team members and guide, make presentation and prepare technical document.

CO/PO Mapping					
COs	Programme Outcomes(POs)				
	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2
CO2	3	2	3	3	3
CO3	3	3	3	2	3
CO4	3	3	2	3	2
CO5	3	3	2	3	3