SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES

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SRI SATYA SAI UNIVERSITY
OF TECHNOLOGY AND MEDICAL SCIENCES

SYLLABUS REVISION

Name of School-School of Engineering

Department-Information Technology

2017-18 TO 2021-22

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Sri Satya Sai
University of Technology and Medical Sciences

(Established under Govt. of M.P. Registered under UGC 2(F) 1956)

Ref. No.: SSSBes/SoE/37/01

Date: 13|06|2017

Name of Faculty: School of Engineering

Name of Department: Information Technology

Minutes of Board of Studies Committee Meeting Dated on 13-06-2017

The Board of Studies Committee was held in room of Department of Information Technology at 3:00 PM, on 13-06-2017, Following members were present.

1. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
2. Dr. Tryambak Hiwarkar, Prof., Chairman
3. Mr. Jitendra Sheetlani, Asst. Prof., Member
4. Mr. Manoj Verma, Asst. Prof, Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:

Preparation of Scheme and Syllabus as per CBCS Scheme for III & IV Sem.

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Ref. No.: SSS803/SOE/KT/01

Date: 17/01/2017

Discussion Scheme & Syllabus

Scheme and Syllabus was put before the members as per AICTE guidelines met the current demand in industry, it was discussed in details by the members and some modifications were suggested.

Resolution of the Discussion:

It was resolved that Scheme and Syllabus for III & IV Sem. Following AICTE guidelines and which also met the current demand in industry should be modified and may be accepted.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairman)

1. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
2. Dr. Tryambak Hiwarkar, Prof., Chairman
3. Mr. Jitendra Sheetlani, Asst. Prof., Member
4. Mr. Manoj Verma, Asst. Prof., Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

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Chairman

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Scheme of Examination - CBCS Pattern

Academic Year 2016- 2017

Information Technology (III Semester / II Year)

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Periods / Hour / Week			Credits	Total Marks
			End Sem. Exam.	Mid Tests	Assign-ments/Quiz	End Sem. Practical & viva	Practical Record /Assignment/ Quiz / Presentation	L	T	P		
1	MTH - 301	Computational Techniques	60	30	10	-	-	2	1	-	3	100
2	ITC- 302	Electronics Devices	60	30	10	30	20	2	1	2	4	150
3	ITC - 303	Digital Circuits	60	30	10	30	20	2	1	2	4	150
4	ITC- 304	Programming Language in C	60	30	10	30	20	2	1	2	4	150
5	ITC- 305	Operating System	60	30	10	30	20	2	1	2	4	150
6	ITC- 306	Data Structures & Algorithms	60	30	10	30	20	2	1	2	4	150
		TOTAL	360	180	60	150	100	12	6	10	23	850

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Scheme of Examination - CBCS Pattern

Academic Year 2017–2018   (For B.E 2016 Batch [V Sem])

Information Technology (IV Semester / II Year)

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Periods/ Hour/ Week			Total Marks
			End Sem. Exam.	Mid Tests	Assign-ments/Quiz	End Sem. Practical & Viva	Practical Record /Assignment/ Quiz / Presentation	L	T	P	Credits
1	ITC-401	Discrete Structure	60	30	10	-	-	2	1	-	3	100
2	ITC-402	Object Oriented Programming & Methodology	60	30	10	30	20	2	1	2	4	150
3	ITC-403	Analysis & Design of Algorithms	60	30	10	30	20	2	1	2	4	150
4	ITC-404	Digital Communication	60	30	10	30	20	2	1	2	4	150
5	ITC-405	Data Communication	60	30	10	30	20	2	1	2	4	150
6	ITC-406	Computer System Organization	60	30	10	30	20	2	1	2	4	150
	TOTAL		360	180	60	150	100	12	6	10	23	850

w.e.f. July 2017-18

MTH-301 COMPUTATIONAL TECHNIQUES

UNIT I

MATRICES:- Eigenvalues and Eigenvectors of a real matrix , Characteristic equation , Properties of Eigenvalues and eigenvectors, Cayley-Hamilton Theorem, Diagonalization of matrices, Reduction of a quadratic form to canonical form by orthogonal transformation

UNIT II

INFINITE SERIES:- Sequences, Convergence of series, General properties, Series of positive terms , Tests of convergence (Comparison test, Integral test, Comparison of ratios and D'Alembert's ratio test), Alternating series, Series of positive and negative terms, Absolute and conditional convergence, Power Series, Convergence of exponential, logarithmic and Binomial Series.

UNIT III

FUNCTIONS OF SEVERAL VARIABLES:- Limits and Continuity, Partial derivatives, Homogeneous functions and Euler's theorem, Total derivative, Differentiation of implicit functions, Change of variables, Partial differentiation of implicit functions, Taylor's series for functions of two variables, Errors and approximations, Maxima and minima of functions of two variables

UNIT IV

IMPROPER INTEGRALS:-Improper integrals of the first and second kind and their convergence, Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions, Properties, Evaluation of integrals using Beta and Gamma functions, Error functions.

UNIT V

MULTIPLE INTEGRALS:- Double integrals , Change of order of integration ,Area enclosed by plane curves, Triple integrals, Volume of Solids, Change of variables in double and triple integrals, Area of a curved surface.

TEXT BOOKS:
1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2007.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd.,

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ITC- 302 ELECTRONICS DEVICES

UNIT I

Semiconductor :-Intrinsic and Extrinsic, p-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, Hall effects and its applications. p-n junction, depletion layer, potential barrier, electric field, forward and reverse biased junction, current components in p-n diode, current equation, V-I characteristics, cut in voltages of Si and Ge diode, transition and diffusion capacitance, power dissipation,.

UNIT II

Semiconductor Diode:-Semiconductor diodes, ideal & practical diode equivalent circuit & frequency response, graphical analysis of diode circuits, diode applications, clipping and clamping circuits, half wave & full wave rectifier circuits with & without filters. Type of diodes and their applications, Signal diodes, Power Diode, Zener diode, Varactor diode, Schottky diode, PIN diode, Tunnel diode, Photo diode, Direct tunneling equivalent circuit, Tunnel diode oscillator, Solar Cell, LED, LEDs specification & geometry of LEDs, Colours of LEDs, LCD, Diffusion and Transition capacitance of P-N junction diode, Simple zener regulators.

UNIT III

Diode Applications: p-n junction diode as rectifier, clipper and clamper, The diode as a circuit element, The Load line concept, The Pieces wise linear diode model, Clipping circuits, Clipping at two independent levels, Comparators, Sampling Gate, Rectifiers, Other full wave circuits, Capacitor filter additional diodes circuits.

UNIT IV

Bipolar junction transistor - Construction, basic operation, current components and equations,. CB, CE and CC-configuration, input and output characteristics, Early effect, region of operation, active, cutoff and saturation region Ebers-Moll model, , power dissipation in transistor (Pdmax rating), Photo transistor, Uni-junction Transistor (UJT) : Principle of operation, characteristics.

UNIT V

FET construction- Construction, n channel and p channel, characteristics, parameters, Equivalent model and voltage gain, Enhancement and depletion MOSFET and its Characteristics, analysis of FET in various configuration.

REFERENCES:

1. Boylesad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education
2. Millman and Halkias: Integrated electronics, TMH
3. Graham Bell: Electronic Devices and Circuits, PHI
4. Sendra and Smith: Microelectronics, Oxford Press.
5. Donald A Neamen: Electronic Circuits Analysis and Design, TMH

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List of Experiments

1. V-I characteristics of various Diodes (p-n, Zener, Varactor, Schottky, Tunnel, Photodiode etc)
2. Characteristics of Transistors (BJT and FET)
3 Applications of diodes and Design of various clipping and clamping circuits
4 Design half & full wave rectifier
5 Design & Analysis of transistor amplifier in CE, CB & CC configuration.
6 Design & Analysis of JFET Amplifier.
7 Design & Analysis of MOSFET Amplifier.
8. Design Zener diode as voltage regulator.
9. Design of clipper Circuit.
10. Deign of clamper Circuit.

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ITC-303 - DIGITAL CIRCUITS

UNIT-I

Number System & Boolean Algebra:- Review of number system; types and conversion, codes. Boolean algebra; De-Morgan's theorem, switching functions and simplification using K-maps & Quine McCluskey method.

UNIT-II

Combinational Circuits:- Logic gates, Half and Full adders, Half and Full Substractors Series & parallel addition , BCD adders, Look-ahead carry generator, comparators, code converters, multiplexers and demultiplexers, Function realization using gates & multiplexers, encoders, decoders.

UNIT-III

Sequential Circuits:-Flip flops:- S-R, D, J-K and T Flip Flop, Shift Register, Analysis of synchronous sequential circuits; design of synchronous sequential circuits – Counters, types of counters.

UNIT-IV

Programmable Logic Devices, Memory and Logic Families Memories:- ROM, PROM, EPROM, PLA, PLD, FPGA, Logic families: RTL, DTL, All types of TTL circuits, ECL, I2L, PMOS, NMOS & CMOS logic.

Multivibrator:- Monostable, Bistable, & Astable multivibrator, Schmitt trigger circuits & Schmitt-NAND gates.

UNIT-V

A/D Converter and D/A Converter:-Introduction of Analog to Digital & Digital to Analog converters, sample & hold circuits and V-F converters.

References:

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Malvino & Leach; "Digital Principles & Applications"; TMH
3. W.H. Gothman; "Digital Electronics"; PHI.
4. Millman & Taub; "Pulse, Digital & Switching Waveforms"; TMH
5. Jain RP; Modern digital Electronics; TMH
6. R.J. Tocci, "Digital Systems Principles & Applications".

List of Experiments:

1. To study and test of operation of all logic gates for various IC's (IC#7400,IC#7403,IC# 7408, IC#74332,IC#7486).
2. Verification of Demorgan's theorem.
3. To construct half adder and full adder.
4. To construct half and full subtractor circuits
5. Verification of versatility of NAND & NOR gate.
6. Design a Multiplexer/ Demultiplexer.
7. To demonstrate the operation of RS, JK and D flip-flops.
8. To study 4-bit magnitude comparator.
9. To study operation of binary and decade counter.
10. To study Analog to Digital & Digital to Analog converters

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ITC- 304 –PROGRAMMING LANGUAGE IN C

UNIT I

Fundamentals of C Programming: History of C; Structure of a C Program; Data types; Constant & Variable, naming variables; Operators & expressions; Control Constructs – if-else, for, while, do-while; Case switch statement.

UNIT II

Functions; Arguments; Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life-time rules for various types of variable, static variable; Calling a function; Recursion – basics, comparison with iteration, types of recursion- direct, indirect, tree and tail recursion, when to avoid recursion, examples.

UNIT III

Arrays: Arrays: Introduction to Arrays, Array Declaration. Single and Multidimensional Array, Memory Representation, Strings, String handling functions.

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointer v/s array; Pointer to pointer; Array of pointer & its limitation; Function returning pointers; Pointer to function, Function as parameter.

UNIT IV

Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Union.

Advanced Programming Techniques: Special constructs – Break, continue, exit(), goto & labels; Pointers – & and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free();

UNIT V

Miscellaneous Features: File handling and related functions; printf & scanf family;C preprocessor – basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

References:

1. Kerninghan & Ritchie "The C programming language", PHI
2. Schildt "C:The Complete reference" 4th ed TMH.
3. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi
4. Kanetkar Y. "Let us C", BPB.

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List of Experiment

1. WAP to perform arithmetic operations (Addition, Subtraction, Multiplication, Division) on two numbers.
2. WAP to calculate gross salary of an employee [using formula: gross_sal = basic_sal+hra+da].
3. WAP to calculate area of circle.
4. WAP to evaluate marks of student for 3 subjects, calculate percentage and display their grades.

	Marks	grades
CASE -1:	90-100	A
CASE -2:	80-89	B
CASE -3:	65-79	C
CASE -4:	Otherwise	D

5. WAP to determine sum of odd series from 1 to N
6. WAP to calculate factorial of a number.
7. WAP to print Fibonacci series up to N. [E.g. - 0 1 1 2 3 5...........]
8. WAP to identify whether given number is prime or not.
9. WAP to identify whether given number is even or odd.
10. WAP to print whether given year is leap year or not.
11. WAP to check whether the 5 digit number is palindrome or not [A palindrome number or numeral palindrome is a number that remains the same when its digits are reversed. Like 16461, for example, it is "symmetrical".].
12. WAP to check whether 5 number entered is Armstrong number or not.[An Armstrong number is an n-digit number that is equal to the sum of the nth powers of its digits. Like 153]
13. WAP to find the sum of the digits of a number.
14. WAP to input 3 sides of triangle and identify the type of triangle.
15. WAP to input 5 digit numbers and find the sum of the first and last digit.
16. WAP to check whether the number is power of 2 or not.
17. WAP to find out GCD of two numbers.
18. WAP to check whether given number is perfect power of any natural number.

ITC-305 OPERATING SYSTEM

UNIT I

Introduction:- History of operating System, Types of Operating System: Batch Processing, Real Time, Multitasking & Multiprogramming, Time-sharing system, Operating system services, Operating system structure, System Call & System Boots, Operating system design & Implementations, System protection, Buffering & Spooling.

UNIT II

Processes Management:- The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms, First Come first serve, Round Robin, Shortest run time next, Highest response ratio next, Multilevel Feedback Queues, Performance evaluation of scheduling algorithms stated above.

UNIT III

Deadlock:- Characterization, Methods for deadlock handling, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Process Management in Linux.

File Management:- File system, access methods, free space managements, allocation methods, directory systems, protection, organization,sharing & implementation issues, Disk & Drum Scheduling, File system in Linux & Windows

UNIT IV

I/O Management:- I/O devices organization, I/O devices organization, I/O buffering, I/O Hardware, Kernel I/O subsystem, Transforming I/O request to hardware operations.

Device Management:- Path managements, Sub module, Procedure, Scheduler, Handler, Interrupt Service Routine.

UNIT V

Memory Management:- Memory Hierarchy, MFT & MVT, logical and physical address space, Concept of swapping and Paging, Memory management without swapping or paging, contiguous and non-contiguous allocation, segmentation, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation and paging combined with segmentation, Structure & implementation of Page table, Virtual memory, Cache Memory Organization.

REFERENCES:

1. Silberschatz ,"Operating system", Willey Pub.
2. Stuart,"Operating System Principles, Design & Applications",Cengage Learning.
3. Tanninbaum, "Modern operating system",PHI Learning.
4. Dhamdhere, "Operating System",TMH.
5. Achyut S Godbole,"Operating System", TMH.

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List of Experiment

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem (producer consumer).
7. Write a program to implement classical inter process communication problem (Reader Writers).
8. Write a program to implement classical inter process communication problem(Dining_Philosophers).
9. Write a program to implement & Compare various page replacement algorithms.
10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms
11. Write a program to implement Banker's algorithms.
12. Write a program to implement Remote Procedure Call.
13. Write the Devices Drivers for any Device or peripheral.

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ITC-306 DATA STRUCTURES & ALGORITHMS

UNIT I

Introduction: Data structures, Type of Data structure, ordered lists, operations in ordered list, sparse matrices, , arrays multi - dimensional arrays, linked lists, operations on linked list, doubly linked list and its operations, storage pools, garbage collection.

UNIT II

Stack: Stacks and Its Operations, applications of Stacks and queues and operation of queues, difference between Stacks and queues, Circular queues, Mazing problem, Prefix, postfix, infix noations

UNIT III

Trees: Concept of Trees, Type of Trees, applications of Trees , AVL Trees, B -Trees, binary tree, operations on binary tree , Spanning tree, cut sets, graphs, properties of graph, Planner graphs and its applications, Hamiltonian path and circuits Eularian paths and circuits.

UNIT IV

Sorting & Searching : Sorting, Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort, Searching & Hashing: Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation, Symbol Table, Static tree table, Dynamic Tree table.

UNIT V

Sorting & Searching Technique: Sequential Search, Binary Search, Other search techniques, Time complexity & memory requirements, Bubble Sort, Insertion sort, Quick sort, Selection sort, Merge sort, Heap sort, maxima and minima heap.

References:

1. Data Structure by Tanenbaum
2. Data Structure by Horowitz & Sahan

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List of Experiment

1. Write a program to insert an element in one dimensional array.
2. Write a program to delete an element in one dimensional array.
3. Write a program to traverse an element in array.
4. Write a program to merging a two array.
5. Write a program to insert node from a link list.
6. Write a program to delete node from a link list.
7. Write a program to infix to postfix Expression.
8. Write a program to doubly link list and to perform traverse & insertion in it.
9. Write a program to implementing stack Operation push, pop & display.
10. Write a program of C on perform simple queue in array using program.
11. Write a program of C on perform D-queue in array using program.
12. Write a program of C on perform C-queue in array using program.
13. Write a program of C on perform binary tree traversal.
14. Write a program of C perform binary search tree traversal in C program.

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ITC-401 DISCRETE STRUCTURE

UNIT-I

Introduction of Sets: Sets, Type of Sets, Venn Diagrams, Proofs of theorems on sets, Relation & Its types, Composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job-Scheduling problem. Function & Its Type composition of functions, Recursively defined functions, Pigeonhole principle. Theorem proving Techniques: Mathematical induction, contradiction.

UNIT-II

Groups and rings, subgroups, generators and evaluation of powers, Cosets and Lagrange's theorem, permutation groups and Burnside's theorem, Codes and group codes, Isomorphism and automorphism, homomorphism and normal subgroups, rings, internal domains and fields, ring homomorphism, polynomial rings and cyclic codes.

UNIT-III

Proposition, First order logic, logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, quantifiers & its Types. Introduction to finite state machine Finite state machines as models of physical system equivalence machines. Finite state machines as language recognizers.

UNIT-IV

Introduction of Graph: Definition of graphs, type of graph, Paths, Cycles and connectivity, Shortest path in weighted graph, Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

UNIT V

Boolean algebra, lattices and algebraic systems, principles of duality, Algebraic system v/s lattices, distributive and complemented lattices, Boolean lattices and Boolean algebra, uniqueness of finite Boolean algebra's, Boolean functions and Boolean expressions, prepositional calculus.

REFERENCES:

1. C.L.Liu, "Elements of Discrete Mathematics" Tata Mc Graw-Hill Edition.
2. Trembley, J.P & Manohar, "Discrete Mathematical Structure with Application CS", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Lipschutz; Discrete mathematics (Schaum); TMH
5. Deo, Narsingh, "Graph Theory With application to Engineering and Computer Science.", PHI.
6. Krishnamurthy V; "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.
7. S k Sarkar " Discrete Mathematics", S. Chand Pub.

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ITC-402 OBJECT ORIENTED PROGRAMMING & METHODOLOGY

UNIT I

Introduction: Object oriented programming, Introduction, Application, characteristics, difference between object oriented and procedure programming, Comparison of C and C++, Cout, Cin, Data Type, Type Conversion, Control Statement, Loops, Arrays and string arrays fundamentals, Function, Returning values from functions, Reference arguments, Overloaded function, Inline function, Default arguments, Returning by reference.

UNIT II

Object and Classes: Implementation of class and object in C++, access modifiers, object as data type, constructor, destructor, Object as function arguments, default copy constructor, parameterized constructor, returning object from function, Structures and classes, Classes objects and memory, static class data, Arrays of object, Arrays as class Member Data, The standard C++ String class, Run time and Compile time polymorphism.

UNIT III

Operator overloading and Inheritance: Overloading unary operators, Overloading binary operators, data conversion, pitfalls of operators overloading, Concept of inheritance, Derived class and base class, access modifiers, types of inheritance, Derived class constructors, member function, public and private inheritance.

UNIT IV

Pointer and Virtual Function: Addresses and pointers, the address-of operator & pointer and arrays, Pointer and Function pointer, Memory management: New and Delete, pointers to objects, debugging pointers, Virtual Function, Friend function, Static function, friend class, Assignment and copy initialization, this pointer, dynamic type information.

UNIT V

Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and Insertion operators, memory as a stream object, command line arguments, printer output, Function templates, Class templates Exceptions, Containers, exception handling.

REFERENCES:

- David Parsons; Object oriented programming with C++; BPB publication
- Object oriented programming in C++ by Robert Lafore; Galgotia
- Balagurusamy; Object oriented programming with C++; TMH
- Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication

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LIST OF EXPERIMENTS:-

1. Write a program that input's a student's marks in five subjects (out of 100) and print the percentage.
2. Write a program to convert given number of days into years, weeks and days.
3. Write a program to find minimum of three numbers using conditional operator.
4. Write a program to print the largest of three numbers.(only if)
5. Write a program to print the mathematical table of a number.
6. Write a program to swap two numbers (call by reference)
7. Write a program to arrange the array elements in ascending order.
8. Write a program to search a specified element in a given array.
9. Write a program to count number of words, characters, vowels in a given string.
10. Write a program to find the product of two matrices.
11. Write a program to make a structure of student with the following details. (Name,Age,Class,Marks, Average, Result)& Get Input from the user for the data Name, Age, Class Marks and Find the average & result of the student if average>=40 result 'P' if not result 'F'
12. Write a program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.
13. Write a program to create multilevel inheritance. Create classes A1,A2, A3.
14. Write a program to create an array of pointers. Invoke functions using array objects.
15. Write a program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.
16. Write a program to overload unary operator using friend function.
17. Write a program to overload – operator.
18. Write a program to invoke Constructor and Destructor.
19. Write a program to use this pointer and return pointer reference.
20. Write a program to write text in the file. Read the text from the file from end of file. Display the contents of the file in reverse order.

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ITC-403 ANALYSIS & DESIGN OF ALGORITHMS

UNIT–I

Introduction of Algorithms, Analysis of algorithms: Space Complexity, Time Complexity, recurrence relation and Asymptotic Noration, Divide and Conquer: General Methods, Analysis and Design, Binary Search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT-II

Greedy Strategy: Introduction, examples of greedy method like optimal merge pattern, Huffman coding, Minimum spanning trees, knapsack problem, job sequencing with dead lines single source shortest path algorithms.

UNIT-III

Dynamic Programming: Introduction, Problem based on this approach such as 0/1 Knapsack Multistage graph, reliability design, Floyd-warshall algorithms.

UNIT-IV

Backtracking Concept and its example like 8-Queen's problem, Hamiltonian cycle, Graph coloring problem, 15 Puzzle problem, Least Cost Search.

UNIT-V

Introduction to branch & bound method, examples of branch & bound methods like traveling sales man problem, meaning of lower bound theory and its use in solving algebraic problem. NPcompleteness & NP hard problems. Basic Concept of non deterministic algorithms. NP hard and NP complete classes.

REFERENCES:

1. Coremen Thomas, Leiserson CE, Rivest RI.; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. I.Chandra Mohan " Design and Analysis of Algorithms" PHI

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LIST OF EXPERIMENTS: -

1. Implement Binary Search using C++.
2. Implement Quick sort using C++.
3. Implement Strassen Matrix multiplication on the given matrix.
4. Implement Merge sort on the given list of elements.
5. Implement Job sequencing problem using C++.
6. Implement Floyd warshall algorithm using C++.
7. Implement 8 – queens problem using backtracking.
8. Implement graph coloring problem using C++.
9. Implement 0/1 knapsack using branch and bound.
10. Implement travelling salesman problem using C++

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ITC-404 DIGITAL COMMUNICATION

UNIT-I

Introduction: Introduction to Communication system, Need for modulation, Amplitude Modulation, Time domain and frequency domain description, power relations in Am waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector.

UNIT-II

Base Band Modulation: Base band system, sampling theorem, Sampling and signal reconstruction, Aliasing, Types of sampling, Quantization, PCM, Companding, DPCM, ADPCM, Delta modulation, Adaptive delta modulation, T1 carrier system.

UNIT-III

Digital Modulation Techniques:- Modulation techniques for ASK, QASK, FSK, M-ary FSK, BPSK, DPSK, DEPSK, QPSK, M-ary PSK, QAM, MSK, GMSK.

UNIT-IV

Digital Carrier Demodulation Techniques:- Coherent and non-coherent detection of ASK, QASK, FSK, PSK, QPSK, M-ary PSK, DPSK, Noise temperature, Noise bandwidth, Noise figure.

UNIT-V

Information Theory:- Measure of information, Entropy, Source encoding, Error free communication over Noisy channel, Channel capacity of discrete memory less channel, Channel capacity of continuous channel, Practical communication system in lights of Shannon theorem.

REFERENCE BOOKS:

1. Modern Digital and Analog Communication Systems, B. P. Lathi, (3rd Edition), Oxford Publication.
2. Principles of Communication Systems, Taub & Schilling, (2nd Edition), Tata McGraw Hill Publication.
3. S.Haykin, Communication systems, John Wiley 2001
4. Bhatacharya Amitabh, "Digital Communication", Tata McGraw-Hill, 1st Ed., 2006.

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List of Experiments:

1. To understand Sampling theorem and sample speech and audio signal.

2. To generate and observe Pulse Amplitude Modulation, Pulse Width Modulation and Pulse position modulation waveforms.

3. To transmit and receive digital signal using Amplitude Shift Keying.

4. To transmit and receive digital signal using Frequency Shift Keying.

5. To transmit and receive digital signal using Phase Shift Keying (BPSK and QPSK)

6. To understand Pulse Code Modulation to digitize Speech signal.

7. To understand time division Multiplexing and De-multiplexing.

8. To Implement Differential pulse code Modulation and Demodulation.

9. To understand the concept of Delta Modulation and to achieve the Delta Modulation /De-Modulation.

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ITC-405 DATA COMMUNICATION

UNIT - I

Introduction: Data Communication, Components, data representation, data flow and basic model, Serial & Parallel transmission, Data transmission modes, Analog & digital transmission methods, Encoding, Unipolar, Polar, Bipolar, Line & Block codes, Data compression and data compression techniques.

UNIT-II

Multiplexing: Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), Statistical Time Division Multiplexing (STDM), Spread spectrum: Frequency Hopping & Direct Sequence, Terminal handling & Polling, Network Switching Techniques: Circuit, Message, Packet & Hybrid, X.25, ISDN.

UNIT-III

Physical Layer: Physical layer characterization, Physical layer Interface and Standards, digital Interface, Connection, specifications & configuration, Modem, Types of Modem, features, signal constellation, block schematic, Network Devices, Active and Passive Hubs, Repeaters, Bridges, Two & Three layer Switches & Gateway, Network Topologies.

UNIT-IV

Transmission Media: Transmission line characteristics, distortions, Crosstalk, Guided Media and Unguided media, Electromagnetic polarization , Rays and Waves front , Electromagnetic spectrum, Radiation & Propagation of Waves, Inverse square law, Wave attenuation and absorption, Terrestrial Propagation, Skip distance, Radio waves, Microwave, Infrared & Satellite Communication system .

UNIT-V

Data Link Layer: Transmission Errors, Content Error, Flow integrity Error, Error detection & Correction methods, Parity checking, Checksum Error Detection, Cyclic Redundancy Check, Hamming Distance, Interleaved codes, Block Parity, Convolution code, Hardware Implementation, Checksum.

References:

1. Forouzan, "Data communication and Networking", 5e, TATA Mc Graw
2. Stallings William, "Data & Computer Communication", Pearson Education
3. Godbole A., "Data Communication & Network", TMH
4. Miller, " Data Network and Comunication", Cengage Delmar Learning

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List of Experiments

1. Study of Data Communication and Networking. Identify five components of Data communication system.
2. Study of computer network topology and OSI model layered architecture.
3. Study of multiplexing and switching.
4. To Study different types of transmission media.
5. To Study interconnection of cables for data communication.
6. To Study fiber optic communication.
7. To establish a straight over and a Cross over cable in LAN.
8. To Study LAN using Star topology.
9. To Study LAN using Bus topology.
10. To Study LAN using Tree topology
11. Write a program in C to generate Hamming code.

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ITC-406 COMPUTER SYSTEM ORGANIZATION

UNIT -I

Computer Basics and CPU :-Basic computer data types, Complements, Fixed point representation, Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer.

UNIT –II

Control Unit Organization:- Hardwired control unit, Micro programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer.

Computer Arithmetic:- Introduction, Addition and subtraction, Multiplication Algorithms (Booth Multiplication Algorithm), Division Algorithms, Floating Point Arithmetic operations, Decimal Arithmetic Unit.

UNIT –III

Input-Output Organization:- Input-Output Interface, Asynchronous Data Transfer, Modes Of Transfer, Priority Interrupt, DMA, Input-Output Processor (IOP), CPU IOP Communication, Serial communication, simplex/half duplex and full duplex.

UNIT –IV

Memory Organization Memory:- Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Multiprocessors:- Characteristics of Multiprocessors, Interconnection Structures, Inter-processor Communication , Cache Coherence, Shared Memory Multiprocessors.

UNIT –V

Pipeline and Vector Processing: - Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Reference Books: -

1. M. Morris Mano, Computer System Architecture, Pearson

2. Andrew S. Tanenbaum and Todd Austin, Structured Computer Organization, Sixth Edition, PHI

3. M. Murdocca & V. Heuring, Computer Architecture & Organization, WILEY

4. John Hayes, Computer Architecture and Organization, McGraw-Hill

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List of Experiment (Expandable)

1. To study design AND,OR,NOT gate
2. To study design universal gate NAND& NOR
3. To study convent decimal number system to binary No system
4. To study convent decimal number system to octal number system
5. To study convent decimal Number system to hexadecimal Number system
6. To study Binary Adder Half
7. To study Binary Full Adder
8. To study J-K Flip-Flops.
9. To study counters & shift registers.
10. Implementation of Arithmetic algorithms

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Ref. No.: 555 8ca/SOE/IT/02   Date: 15/06/2018

Name of Faculty: School of Engineering

Name of Department: Information Technology

Minutes of Board of Studies Committee Meeting Dated on 15-06-2018

The Board of Studies Committee was held in room of Department of Information Technology at 3:00 PM, on 15-06-2018, Following members were present.

1. Dr. Rajeev Pandey, UIT, R.G.P.V. Bhopal

2. Dr. Tryambak Hiwarkar, Prof., Chairman

3. Mr. Jitendra Sheetlani, Asst. Prof., Member

4. Mr. Manoj Verma, Asst. Prof., Member

5. Mr. Harsh Lohiya, Asst. Prof. Member

6. Mr Gaurav Saxena, Asst. Prof., Member

7. Mr. Rishi Khushwah, Asst. Prof., Member

8. Mr. Kailash Patidar, Asst. Prof., Member

9. Mr. Manoj Yadav, Asst. Prof., Member

10. Mr. Harsh Pratap, Asst. Prof., Member

11. Mr. Sudeesh Chouhan, Asst. Prof., Member

12. Mr. Narendra Sharma, Asst. Prof., Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:

Preparation of Scheme and Syllabus as per CBCS Scheme for V & VI Sem.

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Ref. No. : SSS/BOS/SO5/37/02   Date : 15/06/2018
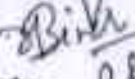
Discussion Scheme & Syllabus
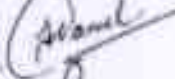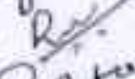
Scheme and Syllabus was put before the members as per AICTE guidelines met the current demand in industry, it was discussed in details by the members and some modifications were suggested.

Resolution of the Discussion:

It was resolved that Scheme and Syllabus for V & VI Sem. Following AICTE guidelines and which also met the current demand in industry should be modified and may be accepted.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairman)

1. Dr. Rajeev Pandey, UIT, R.G.P.V. Bhopal
2. Dr. Tryambak Hiwarkar, Prof., Chairman
3. Mr. Jitendra Sheetlani, Asst. Prof., Member
4. Mr. Manoj Verma, Asst. Prof., Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

Bhopal-Indore Road, Opp. Pachama oilfed plant, Pachama, Dist.-Sehore M.P.PIN-466001 Ph. 07562-223647, Fax : 07562-223644, Web- www.ssutms.co.in, info@ssutms.co.in

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Scheme of Examination - CBCS Pattern

Academic Year 2018- 2019

Information Technology (V Semester/ III Year)

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Periods / Hour / Week			Credits	Total Marks
			End Sem. Exam.	Mid Tests	Assignments/Quiz	End Sem. Practical & Viva	Practical Record /Assignment/Quiz / Presentation	L	T	P		
1	ITC-501	Microprocessor & Interfacing	60	30	10	30	20	2	1	2	4	150
2	ITC-502	Computer Graphics	60	30	10	30	20	2	1	2	4	150
3	ITC-503	Java Programming	60	30	10	30	20	2	1	2	4	150
4	ITC-504	Department Elective-I	60	30	10	-	-	2	1	2	3	100
5	ITC-505	Department Elective-II	60	30	10	-	-	2	1	2	3	100
6	ITC-506	Open Elective	60	30	10	-	-	2	1	2	3	100
7	ITC-507	Industrial Training-I	-	-	-	-	100	-	-	4	2	100
		TOTAL	360	180	60	90	160	12	6	10	23	850

Department Elective-I	ITC-504(A) Principles of Programming Languages	ITC-504(B) Information Retrieval	ITC-504(C) Computer Vision
Department Elective-II	ITC-505 (A) Software Engineering	ITC-505(B) Graph Theory	ITC-505(C) Real Time Fault Tolerant Systems
Open Elective	ITC-506(A) Multimedia	ITC-506(B) Advance Computer Architecture	ITC-506(C) Information Theory & Coding

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Scheme of Examination - CBCS Pattern

Academic Year 2018 – 2019

Information Technology [VI Semester / III Year]

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Periods/ Hour/ Week			Credits	Total Marks
			End Sem. Exam.	Mid Tests	Assign-ments/Quiz	End Sem. Practical & Viva	Practical Record /Assignment/Quiz / Presentation	L	T	P		
1	ITC-601	Computer Networking	60	30	10	30	20	2	1	2	4	150
2	ITC-602	Dot Net Technology	60	30	10	30	20	2	1	2	4	150
3	ITC-603	Data Base Management Systems	60	30	10	30	30	2	1	2	4	150
4	ITC-604	Department Elective-III	60	30	10	-	-	2	1	-	3	100
5	ITC-605	Department Elective-IV	60	30	10	-	-	2	1	-	3	100
6	ITC-606	Open Elective	60	30	10	-	-	2	1	-	3	100
7	ITC-607	Industrial Training Project - I	-	-	-	100	-	-	-	4	2	100
		TOTAL	360	180	60	190	60	12	6	10	23	1540

Department Elective-I	ITC-604(A) Distributed System	ITC-604(B) Digital Image Processing	ITC-604(C) Human Computer Interface
Department Elective-II	ITC-605(A) Theory of Computation	ITC-605(B) Network Analysis and Synthesis	ITC-605(C) Cyber Crime & Information Warfare
Open Elective	ITC-606(A) Data & Shell Programming	ITC-606(B) PHP Technology	ITC-606(C) Statistical Method

ITC-501 MICROPROCESSOR & INTERFACING
UNIT-I

Introduction to microprocessors, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture, advancements of microprocessors.

UNIT-II

Architecture of 8085 microprocessor, Instruction set and Addressing modes of 8085 microprocessor, Assembly language programs of 8085 microprocessor, Stack, Subroutines, Time-Delay loops, Modular programming, Macro.

UNIT-III

8086 Microprocessor: Architecture, Register, Memory Segmentation, 8086 Memory Addressing Memory Read and Write Bus Cycle of 8086, Demultiplexing of the system Bus in 8086 and 8088 microprocessors, Instruction set and Addressing modes of 8086 microprocessor, Assembly language programs of 8086 microprocessor.

UNIT-IV

I/O and Memory Interfacing Using 8085/8086, Interrupts of 8085/8086 Microprocessors, 8259A Programmable Interrupt Controller, Programmable peripheral Interface, 8253 Programmable Counter/Interval Timer, Communication and Bus Interfacing with 8085/8086 Microprocessor, Serial Communication Interface, DMA Controller 8257, 8279-Programmable Keyboard and Display I/O Interface, Bus Interface, 8089 I/O processor.

UNIT-V

8051 Microcontroller: Architecture of 8051 microcontroller, Memory organization, Timers/Counters, Interrupts, Addressing modes, 8051 Instruction set, Assembly language Programs, Applications of microcontrollers.

REFERENCES:

1. Douglas V Hall, "Microprocessors and interfacing – Programming & Hardware" TMH.
2. Gaonkar, "Microprocessor Architecture, Programming & Applications with 8085", TMH Grading System 2013 – 14.
3. Rafiquzzaman, "Microprocessors-Theory & Applications", PHI.
4. Savaliya, "8086 Programming & Advance Processor Architecture", Wiley India.
5. Ray, Bhurchandi, "Advanced Microprocessor and peripherals" TMH Pub.
6. Soumitra Kumar Mandal, "Microprocessors and Microcontroller" TMH Pub.

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LIST OF EXPERIMENTS:

1. To study 8085 based microprocessor system.
2. To study 8086 based microprocessor system.
3. To develop and run a program for finding out the largest/smallest number from a given set of numbers.
4. To develop and run a program for arranging in ascending/descending order of a set of numbers.
5. To perform multiplication/division of given numbers.
6. To perform conversion of temperature from 0F to 0C and vice-versa.
7. To perform computation of square root of a given number.
8. To perform floating point mathematical operations (Addition, Subtraction, Multiplication and Division).
9. To obtain interfacing of RAM chip to 8085/8086 based system.
10. To obtain interfacing of keyboard controller.

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ITC-501 COMPUTER GRAPHICS

UNIT-I
Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

UNIT-II
Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-III
2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT-IV
2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen Sutherland and Cyrus-beck line clipping algorithms, Sutherland Hodgeman polygon clipping algorithm.

UNIT-V
3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces, Basic illumination models, polygon rendering methods.

REFERENCES:
1. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc Graw hill edition.
2. "Procedural elements for Computer Graphics", David F Rogers, Tata Mc Graw hill, 2nd edition.
3. "Principles of Interactive Computer Graphics", Neuman and Sproul. TMH.
4. "Principles of Computer Graphics", Shalini, Govil-Pai, Springer.

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LIST OF EXPERIMENTS:

1. To implement Bresenham's algorithm for circle and ellipse drawing.

2. Program for Line Drawing using Bresenham's algorithm using C and OpenGL.

3. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.

4. To implement Cohen–Sutherland 2D clipping and window–viewport mapping.

5. To perform 3D Transformations such as translation, rotation and scaling.

6. To visualize projections of 3D images and Hidden Surface Elimination.

7. To convert between color models.

8. To implement text compression algorithm.

9. Program to implement basic graphics primitives in OpenGL.

10. Program for Line Drawing using DDA algorithm using C and OpenGL.

ITC-503 JAVA PROGRAMMING

UNIT-1

Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structure including selection, Looping, Java methods, Overloading, Math class, Arrays in java.

UNIT-II

Objects and Classes: Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference.

UNIT-III

Inheritance and Polymorphism: Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

UNIT-IV

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames. **Layout Managers:** Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

UNIT-V

Multithreading in java, Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to Java Beans and Network Programming.

REFERENCES:

1. Programming in Java, Sachin Malhotra & Saurabh Chaudhary, Oxford University Press.
2. The Complete Reference, Java.
3. (Fourth Edition), Herben Schild, TMH.
4. Java Programming, D. S. Malik, Cengage Learning.
5. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill.

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LIST OF EXPERIMENTS:

1. Write a Java program that displays area of different (Rectangle, Square, Triangle) using the method overloading.
2. To write a java program to print the individual digits of a 3 digit number.
3. To write a java program to read an integer and find whether the number is odd or even.
4. To write a java program find the biggest of three integers.
5. To write a java program to find the first 15 terms of Fibonacci sequence.
6. To write a java program to work with the creation of objects for the class with overloaded constructor and user defined methods returning a value.
7. To write a java program to get and sort names by command line argument.
8. To write a java program to understand the concept of functionalities of different Bitwise operators.
9. To write a java program to understand the concept of Method Overriding.
10. To write a java program to understand the steps in the creation of packages.

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ITC-504(A) PRINCIPLES OF PROGRAMMING LANGUAGES
UNIT-I

Programming Language and Its Implementation: Programming Language, Language categories, Language Evaluation Criteria, impacts on Language design, Programming Paradigms – Imperative, Object Oriented programming Structure, functional Programming, Logic Programming, Programming Language Implementation, Compilation process and Virtual Machines, programming environments.

UNIT-II

Data types and Statements: Overviews of Data type, category of data type, primitive and Non primitive data types, design and implementation uses related to these types, Names, Variable, type checking, strong typing, type compatibility, named constants, variable initialization, control statement with Expressions, Conditional Statements, Loops, Exception handling.

UNIT-III

Subprograms and Blocks: Overviews of sub-programs, Lifetime and Scope of variable, static and dynamic scope, Design issues of subprograms, parameter passing methods: call by value, address and reference , overloaded sub-programs, Method Overriding, generic subprograms, , co-routines.

UNIT-IV

Abstract Data types: Data abstraction, level of abstraction, Abstractions and encapsulation, abstract data type, Static and Stack-Based Storage management, heap based storage management, Garbage Collection, object oriented programming in small talk, C++, Java, C#, PHP, Perl, Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT-V

Exception Handling: Error, Type of Error, Exceptions, Type of Exception, exception Propagation, Exception handler in C++ and Java, Try, catch and throw statement, multiple catch.

REFERENCES:
1. Sebesta, "Concept of programming Language", Pearson Edu.
2. Louden, "Programming Languages: Principles & Practices", Cengage Learning.
3. Tucker, " Programming Languages: Principles and paradigms ", Tata McGraw –Hill.
4. Terrance W Pratt, "Programming Languages: Design and Implementation" Pearson Edu.

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ITC-504(B) INFORMATION RETRIEVAL

UNIT-I
Introduction: Introduction –History of IR, Components of IR Issues, Open source Search engine Frameworks, The impact of the web on IR - The role of artificial intelligence (AI) in IR – IR Versus Web Search Components of a Search engine, Characterizing the web.

UNIT-II
Information Retrieval: Boolean and vector-space retrieval models Term weighting - TF-IDF weighting- cosine similarity, Preprocessing Inverted indices, efficient processing with sparse vectors, Language Model based IR, Probabilistic IR, Latent Semantic Indexing Relevance feed backand query expansion.

UNIT-III
Web Search Engine – Introduction And Crawling: Web search overview, web structure, the user, paid placement, search engine optimization/ spam, Web size measurement, search engine optimization/spam, Web Search Architectures, crawling, meta-crawlers, Focused Crawling, web indexes, Near-duplicate detection, Index Compression XMLretrieval.

UNIT-IV
Web Search – Link Analysis And Specialized Search: Link Analysis, hubs and authorities, Page Rank and HITS algorithms, Searching and Ranking, Relevance Scoring and ranking for Web, Similarity Hadoop & Map Reduce, Evaluation, Personalized search, Collaborative filtering and content-based recommendation of documents and products, handling "Invisible" Web - Snippet generation, Summarization, Question Answering, Cross. Lingual Retrieval.

UNIT-V
Document Text Mining: Information filtering, organization and relevance feedback, Text Mining, Text classification and clustering, **Categorization algorithms:** naive Bayes, decision trees, and nearest neighbor, **Clustering algorithms:** agglomerative clustering, k-means, expectation maximization (EM).

REFERENCES:
1. Introduction to Information Retrieval South Asian Edition 2008 by Raghavan.
2. Modem Information Retrieval (ACM Press) Paperback – Import, 1999 by Dr Ricardo Baeza-Yates, Dr Berthier Ribeiro-Neto.

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ITC-504(C) COMPUTER VISION

UNIT-I

Image formation and Image model, Components of a vision system, Cameras, camera model and camera calibration Radiometry, Light in space, Light in surface. Sources, shadows and shading.

UNIT-II

Multiple images, The Geometry of multiple views, Stereopsis Affine structure from motion, Elements of Affine Geometry Affine structure and motion from two images, Affine structure and motion from multiple images, From Affine to Euclidean images.

UNIT-III

High level vision, Geometric methods. Model based visionObtaining hypothesis by pose consistency, pose clustering and using Invariants, Verification.

UNIT-IV

Introduction to pattern and classification, supervised and unsupervised learning, Clustering Vs classification, Bayesian Decision Theory, Minimum error rate classification Classifiers, discriminant functions, decision surfaces, The normal density and discriminant, functions for the Normal density.

UNIT-V

Linear discriminant based classifiers and tree classifiers Linear discriminant function based classifiers, Perceptron Minimum Mean Squared Error (MME) method, Support Vector machine, **Decision Tree:** CART, ID3.

REFERENCES:

1. C. M. Bishop, Pattern Recognition and Machine Learning, Springer, 2006.
2. R. O. Duda, P. E. Hart and D. O. Stork. Pattern Classification, John Wiley, 2001.
3. Richard Hartley and Andrew Zisserman, Multiple View Geometry in Computer Vision, Second Edition, Cambridge University Press, 2004.
4. S. Theodoridis and K. Koutroumbas, Pattern Recognition, 4th Ed., Academic Press, 2009.

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ITC-503(A) SOFTWARE ENGINEERING

UNIT-I

System Analysis and Design: Overview of System Analysis & Design, Business System Concept, System Development Life Cycle, Waterfall Model, Spiral Model, Feasibility Analysis, Technical Feasibility, Cost Benefit Analysis, COCOMO model.

UNIT-II

Design related Issues: System Requirement Specification DFD, Data Dictionary, ER diagram, Process Organization & Interactions, System Design. Problem Partitioning, Top-Down And Bottom-Up design, Decision tree, decision table and structured English, Functional vs. Object Oriented approach.

UNIT-III

Coding & Documentation: Coding & Documentation, Structured Programming, OO Programming, Information Hiding, Reuse, System Documentation, Testing Levels of Testing, Integration Testing, Test case Specification, Reliability Assessment, Validation &Verification Metrics, Monitoring & Control.

UNIT-IV

Coding standard and guidelines, programming style, code sharing, code review, software components, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging.

UNIT-V

Software quality Assurance, Software quality factors. Quality assurance, quality metrics, Halstead's S/W Science. Software Testing, Techniques S/W testing fundamentals, White Box testing, Black box testing, Validation Testing, system Testing, debugging, software maintenance maintainability, maintenance tasks, Reverse engineering and Re engineering.

REFERENCES:

1. Roger S. Pressman –"Software Engineering", Mc.Graw Hill.
2. Rajiv mall: Software engineering".
3. Sommerville, "Software Engineering", Pearson Education.

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ITC-505(B) GRAPH THEORY

UNIT-I
Introduction Graphs: Introduction, Isomorphism, Sub graphs, Walks, Paths, Circuits, Connectedness, Components, Euler graphs, Hamiltonian paths and circuits, **Trees:** Properties of Tree, Distance and centers in tree, Rooted and binary trees.

UNIT-II
Trees, Connectivity & Planarity: Spanning trees, Fundamental circuits, Spanning trees in a weighted graph, **Cut Sets:** Properties of cut set, All cut sets, Fundamental circuits and cut set, Connectivity and separability, Network flows, 1-Isomorphism, 2-Isomorphism, Combinational and geometric graphs, Planer graphs, Different representation of a Planner graph.

UNIT-III
Matrices, Colouring And Directed Graph: Chromatic number, Chromatic partitioning, Chromatic polynomial, Matching, Covering, Four color problem, Directed graphs, Types of directed graphs, Digraphs and binary relations, Directed paths and connectedness, Euler graphs.

UNIT-IV
Permutations & Combinations: Fundamental principles of counting, Permutations and combinations, Binomial theorem, combinations with repetition, Combinatorial numbers, Principle of inclusion and exclusion, Derangements, Arrangements with forbidden positions.

UNIT-V
Generating Functions: Generating functions, Partitions of integers, Exponential generating function, Summation operator, **Recurrence relations:** First order and second order, Non-homogeneous recurrence relations, Method of generating functions.

REFERENCES:

1. Clark J. and Holton D.A, "A First Look at Graph Theory", Allied Publishers, 1995.
2. Mott J.L, Kandel A. and Baker T.P. "Discrete Mathematics for Computer Scientists and Mathematicians", Prentice Hall of India, 1996.
3. Liu C.L., "Elements of Discrete Mathematics", Mc Graw Hill, 1985.
4. Rosen K.H., "Discrete Mathematics and Its Applications", Mc Graw Hill, 2007.

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ITC-505(C) REAL TIME FAULT TOLERANT SYSTEMS

UNIT-I

Structure of Real Time System, Performance Measure for real time system, Task Assignments, Fault Tolerant Scheduling, Real Time Vs General purpose Data Bases, Data Bases for Hard Real Time System, Real Time Communication.

UNIT-II

Fault Tolerance, Fault-Error-Failure, Redundancy, Error Detection. Damage Confinement, Error Recovery, Fault Treatment, Fault Prevention, anticipated and unanticipated Faults, **Error models:** General coding scheme Error detection techniques, Watchdog processors, Heartbeats, consistency and capability checking, Data audits, Assertions, Control-flow checking, Error control coding. **Application:** DHCP.

UNIT-III

Fault tolerance: Coding technique fault, Tolerant self checking and fail safe circuits, Fault tolerance in combinatorial and sequential circuits, Synchronous and Asynchronous fail safe circuits, **Software fault tolerance:** Process pairs, Robust data structures, N version programming, Recovery blocks, Replica consistency & reintegration, Multithreaded programs Application, VAX, Network fault tolerance, Reliable communication protocols, Agreement protocols, Database commit protocols Application, Distributed SQL server Check pointing & Recovery Application, Micro check pointing, IRIX Checkpoints.

UNIT-IV

Experimental Evaluation: Modelling and simulation based, Fault injection based Application, NFTAPE fault injector, Modelling for performance, Dependability and perform ability, Dependability specific methods (fault trees, reliability block diagrams), Queues, Stochastic Petri nets and stochastic activity networks Application, Ultra SAN.

UNIT-V

Practical Systems for Fault Tolerance: Ad-hoc wireless network , NASA Remote Exploration & Experimentation System Architecture, Fault tolerant computers, General purpose commercial systems, Fault tolerant multiprocessor and VLSI based communication architecture, Fault tolerant software, Design-N-version programming recovery block acceptance tests-fault trees validation of fault tolerant systems.

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REFERENCES:

1. K.K.Pradhan, "Fault Tolerant computing theory and techniques" volume III. Prentice Hall,1989.
2. Krishna, Real Time System, TMH.
3. Anderson and Lee. "Fault Tolerant principles and practice" ,PHI 1989.
4. Siewen, Real Time Embeded System, Cengage Learning.
5. Rajiv Mall, Real Time System, Pearson Edu.
6. Parag K. Lala, "Fault Tolerant and Fault Testable, Hardware design" PHI 1985.

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ITC-506(A) ADVANCE COMPUTER ARCHITECTURE

UNIT-I
Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and Multicomputers, Multivector and SIMD Computers. Data and resource dependences, Hardware and Software Parallelism, Program partitioning and scheduling, Grain size and latency, Control flow, Data flow and Demand driven mechanisms. Static interconnection networks, Dynamic interconnection Networks, Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks.

UNIT-II
Instruction set Architecture, CISC Scalar Processors , RISC Scalar Processors, VLIW architecture, Memory Hierarchy, Inclusion, Coherence and Locality, Memory capacity planning. Interleaved memory organization, Memory interleaving, Pipelined memory access, Bandwidth and Fault Tolerance. Backplane Bus System, Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt.

UNIT-III
Linear Pipeline Processor, Nonlinear Pipeline Processor, Instruction Pipeline design, Mechanisms for instruction Pipelining, Pipeline Hazards, Dynamic instruction scheduling - score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic Pipeline, Multifunctional Arithmetic Pipelines. Superscaler Pipeline design, Super Pipeline Processor Design.

UNIT-IV
Cache Coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, Deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes, Vector supercomputer architecture, SIMD organization, Distributed memory model and shared memory model. Principles of Multithreading, Multithreading Issues and Solutions, Multiple-Context Processors.

UNIT-V
Parallel Programming Models, Shared-Variable Model, Message-Passing Model, Data-Parallel Model, Object-Oriented Model, Functional and Logic Models, Parallel Languages and Compilers, Language Features for Parallelism, Parallel Programming Environment, Software Tools and Environments.

REFERENCES:

1. Kai Hwang, "Advanced computer architecture", TMH.
2. J.P.Hayes, "computer Architecture and organization"; MGH.
3. V.Rajarmman & C.S.R.Murthy, "Parallel computer"; PHI Learning.
4. Kain, "Advance Computer Architecture: - A System Design Approach", PHI Learning India.

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ITC-506(B) MULTIMEDIA

UNIT-I

Multimedia System Design: An Introduction Multimedia Elements, Multimedia Applications, Multimedia System Architecture, Evolving Technologies for Multimedia Systems, Multimedia Databases.

UNIT-II

Compression and Decompression Techniques: Types of Compression, Binary Image Compression Schemes, Color, Gray scale, Still-video image compression, Discrete Cosine Transform, Video Image compression, MPEG Coding methodology, Audio Compression, Data and File format standards- RTF, TIFF, RIFF, MIDI, JPEG, AVI, JPEG, TWAIN Architecture.

UNIT-III

Multimedia Input And Output Technologies: Key Technology Issues, Pen Input, Video and Image Display Systems, Prim Output Technologies, Image Scanners, Digital Voice and Audio, Video Images and Animation, Full Motion Video.

UNIT-IV

Storage And Retrieval Technologies: Magnetic Media Technology, RAID-Level-0 To 5, Optical Media, WORM optical drives, Hierarchical Storage Management, Cache Management for storage systems.

UNIT-V

Multimedia Application Design: Types of Multimedia systems, Virtual Reality Design, Components of Multimedia syste, Distributed Application Design Issues, Multimedia Authoring and User Interface, Hypermedia Messaging, Distributed Multimedia Systems.

REFERENCES:

1. Andleigh PK and Thakrar K, "Multimedia Systems", Addison Wesley Longman, 1999.
2. Fred Halsall, "Multimedia Communications", Addison Wesley, 2000.
3. Ralf Steinmetz, Klara Nahrstedt, "Multimedia, computing, communications and applications", Prentice Hall, 1995.
4. Tay Vaughan, "Multimedia making It work", TMH 5th Edition 2001.
5. Weixel, Fulton, Barksdale.Morse, "Multimedia Basics", Easwar Press 2004.

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ITC-506(C) INFORMATION THEORY & CODING

UNIT-I

Uncertainty, Information and Entropy Information Measures, Characteristics on information measure, Shannon's concept of information, Shannon's measure of information, Model for source coding theorem, Communication system, Source coding and line/channel coding, channel mutual information capacity (Bandwidth).

UNIT-II

Channel coding, Theorem for discrete memory less channel, Information capacity theorem: Error detecting and error correcting codes, Types of codes, Block codes, Tree codes, Hamming Codes, Description of linear block codes by matrices, Description of linear tree code by matrices, Parity check codes, Parity check polynomials.

UNIT-III

Compression: Lossless and lossy, Huffman codes, Binary Image compression schemes, Run length Encoding, CCITT group-3 1D compression, CCITT group-3 2D compression, CCITT group-4 2D compression.

UNIT-IV

Video Image Compression: Requirement of full motion video compression, CCITT H 261 video coding algorithm, MPEG compression methodology, MPEG-2 compression, Audio (Speech)compression.

UNIT-V

Cryptography: Encryption, Decryption, Cryptogram (cipher text), Concept of cipher, Cryptanalysis, Keys: Single key (Secret key), Cryptography, two-key (Public key) cryptography, Single key cryptography, Ciphers, Block Cipher code, Stream ciphers, Requirements for secrecy, The data Encryption Standard, Public Key Cryptography, Diffie- Hellmann public key distribution, The Rivest- Shamin Adehmm(R-S-A) system for public key cryptography, Digital Signature.

REFERENCES:

1. Rajan Bose "Information Theory, Coding and Cryptography", TMH, 2002.
2. G A Jones J M Jones, "Information and Coding Theory", Springer Verlag, 2004.
3. Cole, "Network Security", Bible, Wiley INDIA, Second Addition.
4. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006.

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ITC-601 COMPUTER NETWORKING

UNIT–I

Introduction to computer networks and Internet, overview Advantages network, Types server based, peer, hybrid, Server types, Network Topology: Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols Hardware Protocols, software Protocols, Selecting and design the network for an organization.

UNIT-II

Signal Transmission: Digital signaling, Analog Signaling, Bit synchronization, Baseband and Broadband transmission, Network Media types- properties & specialties, Network adapters working principals, configuration and selection.

UNIT-III

Network Layer: Network Layer Design issues, Store and forward packet switching connection less and connection oriented networks routing algorithm's optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT-IV

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP. **Transport Layer:** Services provided to the upper layers elements of transport protocol, Addressing connection establishment, Connection release, Crash Recovery.

UNIT-V

UDP, RPC, Real Time Transport Protocols, The Internet Transport Protocols, Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP. Application Layer: Introduction, providing services, Applications layer paradigms, Client server model, Standard client server application, HTTP, FTP, electronic mail, TELNET, DNS, SSH.

REFERENCES:

1. Andrew & Tanenbaum, "Computer Network ".
2. Prakash C Gupta, "Data Communication.
3. William Stallings, "Data and Computer Communication".
4. Computer Networking and the Internet (5th edition),Fred Halsall, Addison Wesley.
5. TCP/IP Protocol Suite (3rd edition), Behrouz Forouzan, McGraw Hill.

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LIST OF EXPERIMENTS:

1. Establishment and configuration of LAN.
2. Study of WAN.
3. Case study of ARP and RARP Protocols.
4. Study of basic networking commands like ping, ipconfig, etc.
5. Case study of various Routing Strategies.
6. Case studies of various Network Topologies.
7. Study of sliding window protocol.
8. Configuring routers, bridges and switches and gateways.
9. Case study of client-server application.
10. Study of IPv4, IPv6 Protocol.

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ITC-602 DOT NET TECHNOLOGY

UNIT-I
Introduction to .NET Technology, Introduction to VB.NET, Software development and Visual Basic .NET, Visual Basic .NET and .NET frame.

UNIT-II
Visual Basic fundamentals: The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.

UNIT-III
Classes and Objects: Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure.

UNIT-IV
Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns, Adapters and Delegates and Events Data Processing and I/O.

UNIT-V
Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

REFERENCES:

1. Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET" Tata Mcgraw Hill (2002

Edition).
2. Rox "Beginner and Professional Edition VB.NET" Tata Mcgraw Hill.
3. Steven Holzner "Visual Basic .NET Black Book" Wiley Dreamtech Publication.
4. Alex Homer, Dave Sussman "Professional ASP.NET1.1" Wiley Dreamtech.

LIST OF EXPERIMENTS:
1. Working with call backs and delegates in C#.

2. Code access security with C#.

3. Creating a Windows Service with C#.

4. Interacting with a Windows Service with C#.

5. Using Reflection in C#.

6. Perform String Manipulation with the String Builder and String Classes and C#:

7. Using the System .Net Web Client to Retrieve or Upload Data with C#.

8. Working with Page and forms using ASP .Net.

9. Data Sources access through ADO.Net.

10. Working with Data readers, Transactions.

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ITC-603 DATABASE MANAGEMENT SYSTEMS

UNIT-I

Basic Concepts: Introduction to DBMS, File system vs DBMS, Advantages of database systems, Database System architecture, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Entities and attributes, Entity types, Key attributes, Relationships, Defining the E-R diagram of database.

UNIT-II

Relational Model: Structure of relational databases, Domains, Relations, Relational algebra fundamental operators and syntax, relational algebra queries, **Entity Relationship model:** Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features generalization, specialization and aggregation.

UNIT-III

SQL: Data definition in SQL, update statements and views in SQL, Data storage and definitions, Data retrieval queries and update statements, Query Processing & Query Optimization: Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions.

UNIT-IV

Relational Database design: Functional Dependency definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, **Normalization:** 1NF, 2NF, 3NF, Decomposition using FD dependency preservation, lossless join, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF.

UNIT-V

Introduction of transaction, transaction processing and recovery, Concurrency control, Lock management, specialized locking techniques, concurrency control without locking, Protection and Security, Introduction to Distributed databases, Basic concepts of object oriented data base system.

REFERENCES:

1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley.
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill.
3. Toledo; Data base management systems;TMH.
4. Ashutosh Kumar Dubey "Data Base Management Concepts" Katson Publication.

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LIST OF EXPERIMENTS:

1. Study of DBMS, RDBMS and ORDBMS.

2. To study Data Definition language Statements.

3. To study Data Manipulation Statements.

4. Study of SELECT command with different clauses.

5. Study of SINGLE ROW functions (character, numeric, Data functions).

6. Study of GROUP functions (avg, count, max, min, Sum).

7. Study of various type of SET OPERATORS (Union, Intersect, Minus).

8. Study of various type of Integrity Constraints.

9. Study of Various type of JOINS.

10. To study Views and Indices.

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ITC-604(A) – DISTRIBUTED SYSTEM

UNIT-I

Introduction to distributed systems Architecture: for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System.

UNIT-II

Distributed Share Memory And Distributed File System: Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues in DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance, **Naming:** Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

UNIT-III

Inter Process Communication And Synchronization API for Internet Protocol: Data Representation & Marshaling, Group Communication, Client Server Communication, RPC-Implementing RPC Mechanism, Stub Generation, RPC Messages, **Synchronization:** Clock Synchronization, Mutual Exclusion, Election Algorithms; Bully & Ring Algorithms.

UNIT-IV

Distributed Scheduling And Deadlock Distributed Scheduling: Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms.

UNIT-V

Distributed Multimedia & Database system: Distributed Data Base Management System(DDBMS), Types of Distributed Database, **Distributed Multimedia:** Characteristics of multimedia Data, Quality of Service Managements.

REFERENCES:

1. Sinha, Distributed Operating System Concept & Design, PHI.
2. Coulouris & Dollimore, Distributed System Concepts and Design, Pearson Pub.
3. Singhal & Shivratari, Advance Concept in Operating System, McGraw Hill.
4. Aniya & Welch, Distributed Computing, Wiley Pub.

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ITC-404(B) DIGITAL IMAGE PROCESSING

UNIT-I

Digital Image Processing: Elements of a Digital Image Processing system, Structure of the Human eye, Image formation and contrastsensitivity, Sampling and Quantization, Neighbours of a pixel, Distance measures, Photographic file structure and exposure, Filern characteristics, Linear scanner, Video camera, Image processing applications.

UNIT-II

Image Transform: Introduction to Fourier transform DFT, Properties of two dimensional FT, Separability, Translation, Periodicity, Rotation, Average value, FFT algorithm, Walsh transform, Hadamard transform, Discrete Cosine transform.

UNIT-III

Image Enhancement: Definition, Spatial domain methods, Frequencydomain methods, Histogram modify technique, Neighborhood averaging, Media filtering, Lowpass filtering, Averaging of multiple images, Image sharpening by differentiation and high pass filtering.

UNIT-IV

Image Restoration: Definition, Degradation model, Discrete formulation, Circulant matrices, Block circulant matrices, Effect of diagnolization of circulant and block circulant matrices, Unconstrained and constrained restorations, Inverse filtering, Wiener filter, Restoration in spatial domain.

UNIT-V

Image Encoding: Objective and subjective fidelity criteria, Basic encoding process, The mapping, The quantizer, The coder, Differential encoding, Contour encoding, Run length encoding, Image encoding relative to fidelity criterion, Differential pulse code modulation.

REFERENCES:

1. Rafael, C. Gonzlez., and Paul, Wintz, "Digital Image Processing", Addison-Wesley Publishing Company.
2. Jain Anil K., "Fundamentals of Digital Image Processing", Prentice Hall.
3. Sosenfeld, and Kak, A.C., "Digital Image Processing", Academic Press.
4. William K. Pratt., "Digital Image Processing", John Wiley and Sons.

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ITC-604(C) HUMAN COMPUTER INTERFACE

UNIT-I

Introduction, Human Computer Interaction (HCI) concepts and definitions, Nature of interaction human and Machine, interaction design, Understanding and conceptualizing interaction, Understanding users, interfaces and Interactions, Data gathering.

UNIT-II

Introduction to User Centered System Design (UCSD), Natural computing, user centered system design, core concepts, interactive design and its strength and weakness, types of user model, user model and evaluation, Heuristic evaluation.

UNIT-III

Psychological user models, Black box models of human performance, including perception, motor control, memory and problem solving, Quantitative analysis of performance, Human processor, keystroke level model, and GOMS descriptions of user performance.

UNIT-IV

Modeling of system understanding, Mental models and metaphor, use of design prototypes, controlled experiments, Cognitive walkthrough. Evaluation from the perspective of a novice learning to use the system.

UNIT-V

Task analysis and design, Contextual and qualitative studies, use-case driven design. Research techniques, Cognitive dimensions of notations, CSCW, ubiquitous-computing, programmability. new interaction techniques.

REFERENCES:

1.Alan Dix, Janet E. Finlay, "Human-Computer interaction", Pearson Education.
2.Olsen, "Human-Computer Interaction", Cengage Learning.
3.Preece, J. Sharp, H. & Rogers, "Interaction design: beyond human-computer interaction", Y. Wiley.
4.Smith Atakan Serengal, "Human-Computer Interaction", Cengage Learning.

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ITC-605(A) THEORY OF COMPUTATION

UNIT-I

Introduction of the theory of computation, Finite state automata, Description of finite automata, properties of transition functions, Transition graph, designing finite automata, FSM, DFA, NFA, 2-way finite automata, equivalence of NFA and DFA, Mealy and Moore machines.

UNIT-II

Regular grammars, regular expressions, regular sets, closure properties of regular grammars, Arden's theorem, Myhill-Nerode theorem, pumping lemma for regular languages, Application of pumping lemma, applications of finite automata, minimization of FSA.

UNIT-III

Introduction of Context Free Grammar - derivation trees, ambiguity, simplification of CFGs, Normal forms of CFGs, Chomsky Normal Form and Greibach Normal forms, Pumping lemma for CFLs, decision algorithms for CFGs, Designing CFGs, Closure properties of CFL's.

UNIT-IV

Introduction of PDA, formal definition, Closure property of PDA, Examples of PDA, Deterministic Pushdown Automata, NPDA, Conversion PDA to CFG, Conversion CFG to PDA.

UNIT-V

Turing machines basics and formal definition, language acceptability by TM, examples of TM, variants of TMs, Multitape TM, NDTM, Universal Turing Machine, offline TMs, equivalence of single tape and multitape TMs, Recursive and recursively enumerable languages, decidable and undecidable problems –examples, halting problem, reducibility, Introduction of P, NP, NP complete, NP hard problems and Examples of these problems.

REFERENCES:

1. Daniel I.A, Cohen,"Introduction to Computer Theory",Wiley India.
2. John E. Hopcroft, Jeffrey D.Ullman and Rajeev Motwani. "Introduction to Automata Theory, Languages and Computation", Pearson Education.
3. K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHI Learning.
4. Peter Linz, "Introduction to Automata Theory and Formal Languages", Narosa Publishing.
5. John C Martin, "Introduction to languages and the theory of computation", TATA McGraw Hill.

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ITC-60S(B) NETWORK ANALYSIS AND SYNTHESIS

UNIT I

Introduction to circuit elements R,L,C and their characteristics in terms of linearity & time dependant nature, voltage & current sources controlled & uncontrolled sources KCL and KVL analysis, Nodal & mesh analysis, analysis of magnetically coupled circuits, Transient analysis, Transients in RL, RC&RLC Circuits, initial conditions, time constants. Steady state analysis, Concept of phasor & vector, impedance & admittance, Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices, dual networks, Dot convention, coupling coefficient, tuned circuits, Series & parallel resonance.

UNIT II

Network Theorems for AC & DC circuits, Thevenins & Norton's, Superpositions, Reciprocity, Compensation, Substitution, Maximum power transfer, and Millman's theorem, Tellegen's theorem, Problems with dependent & independent sources.

UNIT III

Frequency domain analysis, Laplace transform solution of Integro differential equations, transform of waveform synthesized with step ramp, Gate and sinusoidal functions, Initial & final value theorem, Network Theorems in transform domain.

UNIT IV

Concept of signal spectra, Fourier series co-efficient of a periodic waveform, Symmetries as related to Fourier coefficients, Trigonometric & Exponential form of Fourier series.

UNIT V

Network function & Two port networks, Concept of complex frequency, Network & Transfer functions for one port & two ports, Poles and zeros, Necessary condition for driving point & transfer function, Two port parameters –Z,Y, ABCD, Hybrid parameters, their inverse & image parameters, relationship between parameters, Interconnection of two ports networks, Terminated two port network.

REFERENCES:

1. M.E. Van Valkenburg, Network Analysis, (PHI).
2. F.F.Kuo, Network Analysis.
3. Minal GK; Network Analysis; Khanna Publisher.
4. Mesereau and Jackson; Circuit Analysis- A system Approach; Pearson.
5. Sudhakar & Pillai; Circuit & Networks- Analysis and Synthesis; TMH.
6. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH.
7. Decarlo lin; Linear circuit Analysis; Oxford.
8. William D Stanley : Network Analysis with Applications, Pearson Education.

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ITC-605(C) CYBER CRIME & INFORMATION WARFARE

UNIT-I

Introduction of Cyber Crime, Challenges of cyber crime, Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique.

UNIT-II

Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime, Perception of cyber criminals: hackers, insurgents and extremist group etc. Web servers were hacking, session hijacking.

UNIT-III

Cyber Crime and Criminal justice: Concept of Cyber Crime and the IT Act. 2000, Hacking, Teenage Web Vandals, Cyber Fraud and Cheating, Defamation, Harassment and E-mail Abuse, Other IT Act Offences, Monetary Penalties, jurisdiction and Cyber Crimes, Nature of Criminality, Strategies to tackle Cyber Crime and Trends.

UNIT-IV

The Indian Evidence Act of 1872 v, Information Technology Act 2000: Status of Electronic Records as Evidence, Proof and Management of Electronic Records, Relevancy, Admissibility and Probative Value of EEvidence, Proving Digital Signatures, Proof of Electronic Agreements, Proving Electronic Messages.

UNIT-V

Tools and Methods in Cybercrime: Proxy Servers and Anonymizers, Password Cracking, Key loggers and Spyware, virus and worms, Trojan Horses, Backdoors, DoS and DDoS Attacks, Buffer and Overflow, Attack on Wireless Networks, Phishing: Method of Phishing, Phishing Techniques.

REFERENCES:

1. Principles of Cyber crime, Jonathan Clough Cambridge University Press.

2. John R. Vacca, Computer Forensics:Computer Crime Scene Investigation. 2nd Edition, Charles River Media, 2005.

3. Cyber Law Simplified, VivekSood, Pub: TMH.

4. Cyber Security by Nina Godbole, SunitBelapure Pub: Wiley-India.

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ITC-606(A) UNIX & SHELL PROGRAMMING

UNIT–I

General Overview of the System: System structure, user perspective, O/S services assumption about Hardware The Kernel and buffer cache architecture of Unix O/S, System concepts, Kernel data Structure, System administration, Buffer headers, Structure of the buffer pool, Scenarios for retrieval of the buffer, Reading and writing disk block, Advantage and disadvantage of buffer cache.

UNIT–II

Internal Representation of Files: Inodes, Structure of regular, Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks, Open read write file and record close, File creation, Operation of special files change directory and change root, change owner and change mode, STAT and FSTAT, PIPES mounting and unmounting files system, Link Unlink.

UNIT–III

Structures of Processes and process control: Process states and transitions layout of system memory, The context of a process, manipulation of *process address space*, Sleep process creation/termination. The user Id of a process, changing the size of a process, Killing process with signals, job control, **Scheduling commands:** AT and BATCH,TIME,CORN.

UNIT–IV

Introduction to shell scripts: Shell Bourne shell, C shell, Unix commands, permissions, editors, grep family, shell variables, scripts, metacharacters and environment, if and case statements, for while and until loops, Shell programming.

UNIT–V

Introduction of Awk and perl Programming: Awk pattern scanning, BEGIN and END patterns, Awk arithmetic and variables, and operators, functions, perl, The chop() function, variable and operators, **Networking tools:** Resolving IP addressing, TELNET, FTP, Socket programming, introduction of Linux structure .

REFERENCES:

1. M.J. Bach "Design of UNIX O.S. ", PHI Learning.
2. Y.Kanetkar "Unix shell programming", BPB Pub.
3. B.W. Kernighan & R. Pike, "The UNIX Programming Environment", PHI Learning.

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ITC-606(B) PHP TECHNOLOGY

UNIT-I

Introduction to PHP: Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression.

Handling HTML Form With PHP: Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form , Redirecting a form after submission.

UNIT-II

Decisions and loop: Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html.

Function: What is a function, Define a function, Call by value and Call by reference, Recursive function.

UNIT-III

String: Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function.

Array: Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function.

UNIT-IV

Working with file and Directories: Understanding file& directory, Opening and closing a file, Coping, renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading.

State management: Using query string(URL rewriting), Using Hidden field, Using cookies, Using session.

UNIT-V

String matching with regular expression: What is regular expression, Pattern matching in Php, Replacing text, Splitting a string with a Regular Expression.

Generating Images with PHP: Basics of computer Graphics, Creating Image, Manipulating Image, Using text in Image.

REFERENCES:

1. Learning PHP, MySQL, books by ' O' riley Press.

2. PHP & MySQL.: Novice to Ninja by Kevin Yank.

3. PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman.

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ITC- 604(C) STATISTICAL METHOD

UNIT-I

Interpolation: Forward, Backward, central (Striplings) and divided difference formulas, lagrangie's interpolation, Inverse interpolation for equal and unequal intervals.

Numerical Integration: Newton Cote's formula, Simpson's 1/3rd and 3/8th rule, Gauss Legendre (two and three points) integration formula.

UNIT –II

Introduction of operation research, LP Formulations, Graphical method for solving LP's with 2 variables, Simplex method, Duality, Transportation problem.

UNIT-III

Numerical Solutions of Ordinary Different Equations: Linear Second– order Equations with variable coefficients, Correlation and Regression, Curve Fitting. Numerical solution by Runge Kutta Method, Its application to higher order equations.

UNIT-IV

Second Order linear differential equation with variable coefficients: Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method.

UNIT-V

Linear partial differential equation of second and higher order: Linear homogeneous and Non homogeneous partial diff. equation of nth order with constant coefficients, Separation of variable method for the solution of wave and heat equations.

REFERENCES:
1. Iyengyr M.K. Jain & R.K. Jain "Numerical Methods for scientific and engineering computation", Wiley Eastern (New Age), 1995.
2. E.V. Krishnamurthy & S.K. Sen "Computer Based Numerical Algorithms".
3. Miller & Freund's "Probability and Statistics for Engineers".
4. Dr. D.K. Jain Engineering Mathematics volume III & II.

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Sri Satya Sai
University of Technology and Medical Sciences

(Established under Govt. of M.P. Registered under UGC 2(F) 1956)

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Name of Faculty: School of Engineering

Name of Department: Information & Technology

Minutes of Board of Studies Committee Meeting Dated on 03.06.2019

The Board of Studies Committee Meeting was held in the room of Department of Computer Science Engineering at 2:30 PM. on 04.06.2019, Following members were present.

1. Dr. Tryambak Hiwarkar Prof,(Computer Science and Engineering), Chairman

2. Mr. Arif Hakeem Asst. Prof,(Computer Science and Engineering), Member

3. Dr. Anil Kumar Prof. ,(Computer Science and Engineering), Member

4. Mr. Gajendra Singh, Asst. Prof. ,(Information & Technology), Member

5. Mr. Narendra Sharma, Asst. Prof. ,(Information & Technology), Member

6. Mr. Harsh Pratap Asst. Prof. ,(Information & Technology), Member

7. Mr Kailash Patidar Asst. Prof. ,(Computer Science and Engineering), Member

8. Mr. Manoj Yadav Asst. Prof. ,(Computer Science and Engineering), Member

9. Mr. Harsh Lohiya Asst. Prof. ,(Computer Science and Engineering), Member

10. Ms. .Naina Solanki Asst. Prof. ,(Computer Science and Engineering), Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

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Agenda Preparation of syllabus as per CBCS Scheme for IIIrd and IVth Sem.
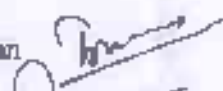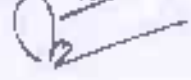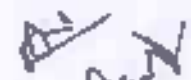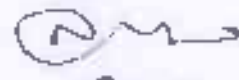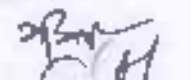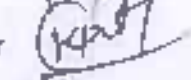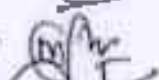
Discussion Scheme

Scheme and syllabus was put before the members as per AICTE guidelines met the current demand in Industry, it was discussed in detail by the members and some modifications were suggested.

Resolution of the Discussion

It was resolved that scheme and syllabus for IIIrd and IVth Sem following AICTE guidelines and which also met the current demand in Industry should be modified and may be accepted.

Signature of All members (Including Chairman)

1. Dr. Tryambak Hiwarkar Prof,(Computer Science and Engineering), Chairman
2. Mr. Arif Hakeem Asst. Prof,(Computer Science and Engineering), Member
3. Dr. Anil Kumar Prof. ,(Computer Science and Engineering), Member
4. Mr. Gajendra Singh, Asst. Prof. ,(Information & Technology), Member
5. Mr. Narendra Sharma, Asst. Prof. ,(Information & Technology), Member
6. Mr. Harsh Pratap Asst. Prof. ,(Information & Technology), Member
7. Mr Kailash Patidar Asst. Prof. ,(Computer Science and Engineering), Member
8. Mr. Manoj Yadav Asst. Prof. ,(Computer Science and Engineering), Member
9. Mr. Harsh Lohiya Asst. Prof. ,(Computer Science and Engineering), Member
10. Ms. Naina Solanki Asst. Prof. ,(Computer Science and Engineering), Member

Chairman

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& Medical Sciences Sehore (M.P.)

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES, SEHORE

Scheme of Examination
Bachelor of Engineering [Information Technology]
III Semester/ II Year
Academic Year 2019-20

S.No.	Subject Code	Subject Name	Theory End Sem.	Theory Mid Sem. Exam.	Theory Quiz/ Assignment	Theory End Sem	Practical Term work Lab Work & Sessional	Total Marks	L	T	P	Total Credits
1.	BEA-301	Mathematics- III	60	30	10	-	-	100	3	1	-	3
2.	ITA-302	Discrete Structure	60	30	10	-	-	100	3	1	-	3
3.	ITA-303	Data Structure	60	30	10	30	20	150	3	-	2	4
4.	ITA-304	Object Oriented Programming & Methodology	60	30	10	30	20	150	2	1	2	4
5.	ITA-305	Digital Circuits & System	60	30	10	30	20	150	3	-	2	4
6.	ITA-306	JAVA Programming Lab	-	-	-	30	20	50	-	-	2	1
7.	ITA-307	Self-Study / GD Seminar	-	-	-	-	50	50	-	-	2	1
		Total	300	150	50	120	130	750	13	2	10	20

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES, SEHORE

Scheme of Examination
Bachelor of Engineering [Information Technology]
IV Semester/ II Year

Academic Year 2019-20

S.No.	Subject Code	Subject Name	Theory			Practical		Total Marks	Periods/ hour/ week			Total Credits
			End Sem.	Mid Sem. Exam.	Quiz/ Assignment	End Sem.	Term work Lab Work & Sessional		L	T	P	
1.	BEA-401	Energy, Ecology, Environment And Society	60	30	10	-	-	100	3	-	-	3
2.	ITA-402	Computer Architecture	60	30	10	30	20	150	2	1	2	4
3.	ITA-403	Analysis and Design of Algorithm	60	30	10	30	20	150	2	1	2	4
4.	ITA-404	Analog & Digital Communication	60	30	10	30	20	150	3	-	2	4
5.	ITA-405	Data base Management System	60	30	10	30	20	150	3	-	2	4
6.	ITA-406	Introduction to MATLAB, Scilab/Web Design	-	-	-	30	20	50	-	-	2	1
7.	ITA-407	Industrial Training-I	*	*	*	*	*	*	*	*	*	*
		TOTAL	300	150	50	150	100	750	13	1	10	20

* To be completed anytime during fourth semester. Its evaluation/credit to be added in fifth semester.

BEA- 301 Mathematics-III

UNIT-I

NUMERICAL METHODS – 1 Solution Of Polynomial And Transcendental Equations – Bisection Method, Newton-Raphson Method And Regula-Falsi Method. Finite Differences, Relation Between Operators, Interpolation Using Newton's Forward And Backward Difference Formulae. Interpolation With Unequal Intervals: Newton's Divided Difference And Lagrange's Formulae.

UNIT-II

NUMERICAL METHODS – 2 Numerical Differentiation, Numerical Integration: Trapezoidal Rule And Simpson's 1/3rd And 3/8 Rules. Solution Of Simultaneous Linear Algebraic Equations By Gauss's Elimination, Gauss's Jordan, Crout's Methods, Jacobi's, Gauss-Seidal, And Relaxation Method.

UNIT-III

NUMERICAL METHODS – 3 Ordinary Differential Equations: Taylor's Series, Euler And Modified Euler's Methods. Rungekutta Method Of Fourth Order For Solving First And Second Order Equations. Milne's And Adam's Predicator-Corrector Methods. Partial Differential Equations: Finite Difference Solution Two Dimensional Laplace Equation And Poission Equation, Implicit And Explicit Methods For One Dimensional Heat Equation (Bender- Schmidt And Crank-Nicholson Methods), Finite Difference Explicit Method For Wave Equation.

UNIT-IV

Transform Calculus Laplace Transform, Properties Of Laplace Transform, Laplace Transform Of Periodic Functions. Finding Inverse Laplace Transform By Different Methods, Convolution Theorem. Evaluation Of Integrals By Laplace Transform, Solving Odes By Laplace Transform Method, Fourier Transforms.

UNIT-V

Concept of Probability Probability Mass Function, Probability Density Function, Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution.

References:

1. P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2nd Edition, Reprint 2012.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.
3. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2010.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
6. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi, 2008.
7. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).
8. S. Ross, A First Course in Probability. 6th Ed., Pearson Education India, 2002.
W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968. Statistic

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ITA- 302 Discrete Structure

UNIT-I

Set Theory, Relation, Function. Theorem Proving Techniques : Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Job Scheduling problem

Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction, Proof by contradiction.

UNIT-II

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

UNIT-III

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Normal Forms, Universal and existential quantifiers. Introduction to finite state machine Finite state machines as models of physical system equivalence machines, Finite state machines as language recognizers

UNIT-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

UNIT-V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms , Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions , Generating functions , Solution by method of generating functions.

Reference Books:

1. C.L.Liu" Elements of Discrete Mathematics" TMH.
2. Lipschutz, "Discrete mathematics (Schaum)",TMH.
3. U.S Gupta " Discrete Mathematical Structures" Pearson.
4. S. Santha," Discrete Mathematics with Combinatorics and graphtheory", Cengage Learning.
5. Dr.Sukhendu. Dey " Graph Theory With Applications" Shroff Publisher

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ITA-303 Data Structure

UNIT-I

Introduction Data, data type, data object. Types of data structure – primitive &n non- primitive , linear & non-linear. Operations on data structures – traversing, searching , inserting , deleting. Complexity analysis – worst case, best case, average case. Time – space trade off , algorithm efficiency, asymptotic notations – big oh , omega , theta.

UNIT-II

Arrays & Structure Introduction , declaration of arrays , operations on arrays – inserting , deleting , merging of two arrays , 1 dimensional & 2 dimensional arrays, row & column major representation , address calculation in array , storing values in arrays , evaluation of polynomial – addition & representation. Searching & sorting – Introduction , sequential search, binary search , Fibonacci search , indexed sequential search, hashed search. Types of sorting with general concepts – bubble , heap , insertion , selection , quick , heap , shell , bucket , radix and merge sort.

UNIT-III

Stacks & Queues Basic concept of stacks & queues, array representation of stacks, operation on stacks – push , pop , create , getTop , empty , linked representation of stack , multiple stack. Application of stack – Conversion: infix , prefix , postfix and evaluation of arithmetic expression. Linked representation of queue, operations on queue – insertion & deletion. Types of queue with functions – circular , deque , priority queue. Applications of queues – job scheduling , Josephus problem.

UNIT-IV

Linked List Introduction – basic terminology , memory allocation & deallocation for linked list. Linked list variants – head pointer , head node , types linked list – linear & circular linked list. Doubly linked list , creation of doubly list, deletion of node from doubly linked list, insertion of a node from doubly linked list, traversal of doubly linked list. Circular linked list – singly circular linked list , circular linked list with header node , doubly circular linked list. Applications of linked list – polynomial representation & garbage collection.

UNIT-V

Trees Basic terminology – general tree , representation of general tree, types of trees, binary tree-realization and properties , traversal in binary trees – inorder , preorder , postorder , applications of trees. Graph- Basic Terminologies and representations, Graph search and traversal algorithms.

References :
1. Varsha H. Patil "Data Structure Using C++" Oxford.
2. Rajesh K. Shukla "Data Structures Using C & C++" Wiley India.
3. Reema Thareja " Data Structure Using C " Oxford.
4. D. S Malik "Data Structure Using C++ " Second Edition Cengage.
5. Kushwaha and Mishra "Data Structure: A programming Approach with C", PHI Learning.
6. A. K Sharma "Data Structure Using C" Pearson.
7. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structures", Computer Science Press

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List of Experiments:-

1. Write a program to search an element in the array using Linear and Binary Search.
2. Write a program to perform the following operation in Matrix:
    1. Addition 2. Subtraction 3. Multiplication 4. Transpose
3. Write a program to perform the following operation on strings using string functions:
    1. Addition 2. Copying 3. Reverse 4. Length of String
4. Write program for implementing the following sorting methods to arrange a list of integers in ascending order:
    a) Quick sort b) Selection sort c) Insertion sort d) Merge sort
5. Write a program that uses stack operations to convert a given infix expression into its postfix equivalent.
6. Write a program to merge two sorted array into one sorted array.
7. Write a program to implement stack using array and linked list.
8. Write a program to implement queue and circular queue using array.
9. Write a program to insert an element in the beginning and end of singly linked list.
10. Write a program to insert an element at any position in singly and doubly linked list.
11. Insert and delete a node at any position in doubly linked list.
12. Write a program of Tower of Hanoi.
13. Write a program that uses functions to perform the following:
    a) Create a binary search tree of integers.
    b) Traverse the above Binary search tree non recursively in in order.

ITA- 304 Object Oriented Programming & Methodology

UNIT-I

Introduction: Object oriented programming, Introduction, Application, characteristics, difference between object oriented and procedure programming, Comparison of C and C++, Cout, Cin, Data Type, Type Conversion, Control Statement, Loops, Arrays and string arrays fundamentals, Function, Returning values from functions, Reference arguments, Overloaded function, Inline function, Default arguments, Returning by reference.

UNIT-II

Object and Classes: Implementation of class and object in C++, access modifiers, object as data type, constructor, destructor, Object as function arguments, default copy constructor, parameterized constructor, returning object from function, Structures and classes, Classes objects and memory, static class data, Arrays of object, Arrays as class Member Data, The standard C++ String class, Run time and Compile time polymorphism.

UNIT-III

Operator overloading and Inheritance: Overloading unary operators, Overloading binary operators, data conversion, pitfalls of operators overloading, Concept of inheritance, Derived class and base class, access modifiers, types of inheritance, Derived class constructors, member function, public and private inheritance.

UNIT-IV

Pointer and Virtual Function: Addresses and pointers, the address-of operator & pointer and arrays, Pointer and Function pointer, Memory management New and Delete, pointers to objects, debugging pointers, Virtual Function, friend function, Static function, friend class, Assignment and copy initialization, this pointer, dynamic type information.

UNIT-V

Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and insertion operators, memory as a stream object, command line arguments, printer output, Function templates, Class templates Exceptions, Containers, exception handling.

Reference Books:
1. E. Balaguruswami, "Object Oriented Programming in C++", TMH.
2. Robert Lafore, "Object Oriented Programming in C++", Pearson.
3. M.T. Somashekara, D.S. Guru, " Object-Oriented Programming with C++", PHI.
4. Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication.

List of Experiments:-

1. Write a program to find out the largest number using function.
2. Write a program to find the area of circle, rectangle and triangle using function overloading.
3. Write a program to implement complex numbers using operator overloading and type conversion.
4. Write a program using class and object to print bio-data of the students.
5. Write a program which defines a class with constructor and destructor which will count number of object created and destroyed.
6. Write a program to implement single and multiple inheritances taking student as the sample base class.
7. Write a program to add two private data members using friend function.
8. Write a program using dynamic memory allocation to perform 2x2 matrix addition and subtraction.
9. Write a program to create a stack using virtual function.
10. Write a program that store five student records in a file.
11. Write a program to get IP address of the system.
12. Write a program to shutdown the system on windows operating system

ITA- 305 Digital Circuits And Systems

UNIT-I

Number systems and logic gates: Decimal, Binary, Octal, Hexadecimal number systems and radix conversion. Codes- BCD, excess 3, gray, ASCII, Boolean algebra- Theorems and properties, Boolean functions, canonical and standard forms, De Morgans theorem, digital logic gates, Karnaugh maps.

UNIT-II

Combinational circuits: Introduction to combinational circuits, multilevel NAND, NOR implementation. Designing binary Adders and Subtractors, Decoder, Encoder, Multiplexer, Demultiplexer circuits.

UNIT-III

Sequential circuits: Introduction to Sequential circuits, flip-flops, RS, D, T, JK, M/S JK-flipflops, truth tables, excitation tables and characteristic equations, clocked and edge triggered flipflops, Registers-Definition, serial, parallel, shift left/right registers, Johnson counter, asynchronous and synchronous counters.

UNIT-IV

Digital logic families: Bipolar and unipolar logic families, Digital IC specifications, RTL, DTL, All types of TTL circuits, ECL, IIL, PMOS, NMOS & CMOS Logic.

UNIT-V

Clocks and timing circuits: Bistable, Monostable & Astable multivibrator, Schmitt trigger circuit, Introduction of Analog to Digital & Digital to Analog converters, Display devices, 7 and 16 segment LED display, LCD.

Reference Books

1. M. Morris Mono, "Digital logic design", Pearson Education Pvt. Ltd.
2. A Anand Kumar, "Fundamentals of digital circuits", PHI Learning Pvt Ltd.
3. A K Maini, "Digital Electronics Principles and Integrated Circuits, Wiley India Pvt Ltd.
4. R P Jain, "Modern Digital Electronics", Tata McGraw-Hill publishing company Ltd.
5. D P Kothari and J S Dhillon, "Digital Circuits and Design", Pearson Education Pvt. Ltd.

List of Experiments:-

1. Study and verify the operation of AND, OR, NOT, NOR and NAND logic gates.
2. Design all basic logic gates using NOR universal gate.
3. Design all basic logic gates using NAND universal gate.
4. Verification of Demorgan's theorem.
5. Construction and verification of half adder and full adder circuits.
6. Construction and verification of half subtractor and full subtractor circuits.
7. Design of Binary to Grey & Grey to Binary code Converters.
8. Design of BCD to excess-3 code converter.
9. Design and verification of Multiplexer circuit
10. Design and verification of De-multiplexer circuit.

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ITA-306 Java Programming Lab

UNIT-I
Overview of Java, Installation, First Simple Program, Compilation process , Java Keywords , Identifiers , Literals, Comments, Data Types, Variables, Dynamic initialization, type conversion and casting, Operators, Control Statements.

UNIT-II
Declaring Objects, Introducing Methods, Constructors, this Keyword, Garbage Collection, finalize Method, Overloading Methods, Overloading Constructors, Using Objects as Parameters, Inheritance, Creating a Multilevel Hierarchy, Packages and Interfaces, Exception Handling, Multithreaded

UNIT III
The Applet Class: Applet Basics, The Applet Class, Applet Architecture, Applet Initialization and Termination , Simple Applet Display Methods, Simple Banner Applet, Using the Status Window, The HTML APPLET Tag, Passing Parameters to Applets, Improving the Banner Applet.

UNIT IV
Introducing the AWT: Working with Windows, Graphics, and Text. AWT Classes, Window Fundamentals, Component, Container, Panel, Frame, Working with Frame Windows, Handling Events in a Frame Window, AWT Controls, Layout Managers, and Menus, Adding and Removing Controls, Grid Layout, Border Layout, introduction to swing and servlet.

UNIT V
Event Handling, Two Event Handling Mechanisms, The Delegation Event Model, Events, Event Sources, Event Listeners, Event Classes, The Mouse Event Class and others. JDBC: JDBCODBC bridge, the connectivity model, the driver manager, navigating the result set object contents, the JDBC exceptional classes, connecting to remote database.

Reference:-
1. E. Balagurusamy, "Programming with java A Primer", McGrawHill.
2. Sharanam Shah, " Core Java 8 for Beginners", Shroff Publisher.
3. Naughton & Schildt, "The Complete Reference Java 2", Tata McGraw Hill.
4. Horstmann & Cornell, "Core Java 2" (Vol I & II), Pearson.

List of Experiments:
1. Write a program that accepts two numbers from the user and print their sum.
2. Write a program to calculate addition of two number using prototyping of methods.
3. Program to demonstrate function overloading for calculation of average.
4. Program to demonstrating overloaded constructor for calculating box volume.
5. Program to show the detail of students using concept of inheritance.
6. Program to demonstrate package concept.
7. Program to demonstrate implementation of an interface which contains two methods declaration square and cube.
8. Program to demonstrate exception handling in case of division by zero error.
9. Program to demonstrate multithreading.
10. Program to demonstrate JDBC concept using create a GUI based application for student information.

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11. Program to display "Hello World" in web browser using applet.
12. Program to add user controls to applets.
13. Write a program to create an application using concept of swing.
14. Program to demonstrate student registration functionality using servlets with session management.

ITA-307 Self-Study / GD Seminar

Objective of GD and seminar is to improve the mass communication and convincing/understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves. Evaluation will be done by assigned faculty based on group.

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BEA-401 Energy, Ecology, Environment and Society

UNIT -I

Sources of Energy : Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, hydro, nuclear sources.

UNIT-II

Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Cycles in Ecosystem – Water, Carbon, Nitrogen. Biodiversity: Threats and conservation

UNIT-III

Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants, Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain. Sound Pollution: Causes, controlling measures, measurement of sound pollution (deciblage), Industrial and non – industrial.

UNIT-IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent. Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

UNIT-V

Society, Ethics & Human values– Impact of waste on society. Solid waste management Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study . Preliminary studies regarding Environmental Protection Acts , introduction to value education, self exploration, sanyam & swasthya.

REFERENCES:

1. Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2. Rana SVS ; "Essentials of Ecology and Environment"; PHl Pub.
3. Raynold, GW "Ethics in information Technology"; Cengage.
4. Svakumar, Energy Environment & Ethics in society; TMH
5. AK De "Environmental Chemistry"; New Age Int. Publ.
6. HK Sharma, "Environmental Chemistry" ; Goel Publ. House.
7. Bala Krishnamoorthy; "Environmental management"; PHI
8. Gerard Kiely, "Environmental Engineering" ; TMH
9. Miller GT JR; living in the Environment Thomson/cengage
10. Cunningham WP and MA; principles of Environment Sc: TMH
11. Gandhiji M.K.- My experiments with truth

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ITA- 402 Computer Architecture

UNIT-I
Computer architecture and organization, computer generations, von Neumann model, CPU organization, CPU organization, Register organization, Various CPU register, Register Transfer, Bus and Memory Transfers, Arithmetic, Logic and Shift micro-operations, Arithmetic logic shift unit.

UNIT-II
The arithmetic and logic unit, Fixed-Point representation: integer representation, sign- magnitude, 1's and 2's complement and range, Integer arithmetic: negation, addition and subtraction, multiplication, division, Floating-Point representation, Floating-Point arithmetic, Hardwired micro-programmed control unit, Control memory, Micro-program sequence.

UNIT-III
Central Progressing Unit (CPU), Stack Organization, Memory Stack, Reverse Polish Notation, Instruction Formats, Zero, One, Two, Three- Address Instructions, RISC Instructions and CISC Characteristics, Addressing Modes, Modes of Transfer, Priority Interrupt, Daisy Chaining, DMA, Input-Output Processor (IOP).

UNIT-IV
Computer memory system, Memory hierarchy, main memory: RAM, ROM chip, auxiliary and associative memory, Cache memory: associative mapping, direct mapping, set- associative mapping, write policy, cache performance, Virtual memory: address space, memory space, address mapping, paging and segmentation, TLB, page fault, effective access time, replacement algorithm.

UNIT-V
Parallel Processing, Pipelining General Consideration, Arithmetic Pipeline, and Instruction Pipeline, Vector Operations, Matrix Multiplication, and Memory Interleaving, Multiprocessors, Characteristics of Multiprocessors.

Reference Books:-
1. M. Morris Mano, "Computer System Architecture", Pearson.
2. Dr. M. Usha, T.S. Srikanth, "Computer System Architecture and Organization", Wiley India.
3. William Stallings, "Computer Organization and Architecture", Pearson.
4. V. Rajaraman, T. Radhakrishnan, "Computer Organization and Architecture", PHI.

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ITA- 403 Analysis And Design Of Algorithm

UNIT-I
Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort. Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, strassen's matrix multiplication.

UNIT-II
Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm, etc.

UNIT-III
Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm, etc.

UNIT-IV
Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc. Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.

UNIT-V
Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniques for trees and graphs (In order, preorder, postorder, DFS, BFS), NP-completeness.

Reference Books:-
1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. Michael T Goodrich, Roberto Tamassia, Algorithm Design, Wiely India

List of Experiments:
1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for optimal merge patterns.
6. Write a program for Huffman coding.
7. Write a program for minimum spanning trees using Kruskal's algorithm.
8. Write a program for minimum spanning trees using Prim's algorithm.
9. Write a program for single sources shortest path algorithm.
10. Write a program for Floye-Warshal algorithm.
11. Write a program for traveling salesman problem.
12. Write a program for Hamiltonian cycle problem.

ITA- 404 Analog & Digital Comm.

Unit-I

Signals and Systems: Block diagram of a communication system, signal-definition, types of signals continuous, discrete, deterministic, non-deterministic, periodic, non-periodic, energy, power, analog and digital signals. Electromagnetic Spectra, Standard signals- DC, sinusoidal, unit step, ramp, signum, rectangular pulse, impulse(delta) signal. System definition, classification of systems, linear, nonlinear, time variant, time invariant, causal, non causal, stable and unstable systems. Fourier transforms: Time domain and frequency domain representation of signal, Fourier Transform and its properties, conditions for existence, Transform of Gate, unit step, constant, impulse, sine and cosine wave. Shifting property of delta function, convolution, time and frequency convolution theorems.

UNIT-II

Amplitude modulation: Modulation, need of modulation, types of modulation techniques, amplitude modulation (DSB-FC), modulation index, frequency spectrum of AM wave, linear and over modulation, power relation in AM, transmission efficiency, modulation by a complex signal, bandwidth of AM, AM modulators, square law and switching modulator, advantages and disadvantages of AM. Demodulation of AM: Suppressed carrier amplitude modulation systems, DSB-SC, SSB-SC, VSB-SC systems, comparison of various amplitude modulation systems. Demodulation of AM, square law and envelope detector, synchronous detection of AM, Low and high power AM transmitters, AM receivers, TRF and superheterodyne receivers, sensitivity, selectivity and fidelity of receivers.

UNIT-III

Angle modulation: Introduction and types of angle modulation, frequency modulation, frequency deviation, modulation index, deviation ratio, bandwidth requirement of FM wave, types of FM. Phase modulation, difference between FM and PM, Direct and indirect method of FM generation. FM demodulators- slope detector, Foster seeley discriminator, ratio detector. Introduction to pulse modulation systems.

UNIT-IV

Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation (PAM), Time division, multiplexing (TDM), Channel Bandwidth for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digital signal, Quantization, Quantization error, Pulse code modulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM (DPCM), Delta Modulation (DM) and Adaptive Delta Modulation (ADM), comparison of various systems.

UNIT-V

Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude shift keying (ASK) Binary Phase Shift keying (BPSK), Differential phase shift keying (DPSK), offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM).

Reference Books:

1. Singh & Sapre, "Communication Systems", TMH.
2. Taub Schilling, "Principles of Communication Systems", TMH.
3. W. Tomasi "Electronic Communications Systems", Pearson Education Pvt. Ltd.
4. Taub & shilling, "Communication Systems", TMH.
5. Abhay Gandhi, "Analog and Digital Communication", CENGAGE Learning.

List of Experiments:

1. AM Modulation and Demodulation (Envelope Detector)
2. Frequency modulation using reactance modulator.
3. Frequency modulation using varactor modulator.
4. Pulse Amplitude Modulation and Demodulation
5. Pre-emphasis and De-emphasis
6. Analog Multiplexing.
7. Amplitude Modulation using Pspice
8. Receiver characteristics (selectivity, sensitivity, fidelity).
9. Operation of foster-seeley loop detector.
10. Operation of ratio detector.

ITA- 405 Data Base Management System

UNIT-I

Basic Concepts: Introduction to DBMS, File system vs DBMS, Advantages of database systems, Database System architecture, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Entities and attributes, Entity types, Key attributes, Relationships, Defining the E-R diagram of database.

UNIT-II

Relational Model: Structure of relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries, Entity-Relationship model :Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features –generalization, specialization and aggregation

UNIT-III

SQL: Data definition in SQL, update statements and views in SQL: Data storage and definitions, Data retrieval queries and update statements, Query Processing & Query Optimization: Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, Case Study of ORACLE and DB2.

UNIT-IV

Relational Database design: Functional Dependency –definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization –1NF, 2NF, 3NF, Decomposition using FD-dependency preservation, lossless join, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF

UNIT-V

Introduction of transaction, transaction processing and recovery. Concurrency control: Lock management, specialized locking techniques, concurrency control without locking, Protection and Security Introduction to: Distributed databases, Basic concepts of object oriented data base system.

Reference Books:

1. Korth, Silberiz, Sudarshan, "Database Concepts", McGraw Hill.
2. Elmasri, Navathe, "Fundamentals of Database Systems", Pearson.
3. Ivan Bayross, "SQL, PL/SQL the Programming Language of Oracle", BPB publications.
4. S. Sharma, J. Agrawal, S. Agrawal, "Advanced Database Management System", Dreamtech Press.
5. Leon & Leon, "Fundamental of Data Base Management System", TMH

List of Experiments:

1. To perform various SQL Commands of DDL, DML, DCL.
2. Write SQL Commands such as Insertion, deletion and updation for anyschema.
3. To execute Nested Queries, Join Queries, order-by, having clause and stringoperation.
4. To perform set operators like Union, Intersect, Minus on a set of tables.
5. To execute various commands for GROUP functions (avg, count, max, min, Sum).
6. Write a PL/SQL block for transaction application using Trigger.
7. Write a DBMS program to prepare report for an application using function.
8. Designing of various Input screens/Forms.
9. Create reports using database connectivity of Front end with back end.
10. Create database Design with normalization and implementing in any application.

ITA- 406 Introduction to MATLAB/SciLab/Web Design

Introduction to MATLAB/SciLab Installing MATLAB/SciLab Under windows/linux, Basics of MATLAB programming, Data Types, Creating variables, comments, multiline comments, Array operations in MATLAB/Scilab, Loops and execution control statements, inbuilt mathematical functions, Working with files: Scripts and Functions, Plotting and program output, overview of various toolboxes, introduction to Matlab simulink.

Introduction to Web Design Introduction, Elements, Tags, Attributes, Paragraph, Headings, Line Breaks, Horizontal Rule, Lists, Formatting, Color Codes, Font, Text Links, Email, Images, Image Link, Forms, Table, Frames, Comments, Music Codes, Video Codes, Div, DHTML: Cascading Style Sheet Introduction, Types of CSS, Selectors (Tags), Class and Id with the Selectors, CSS Background & Color, CSS Text, CSS Font, CSS Border, CSS Padding.

Reference Books:

1. Fausett L.V. (2007) Applied Numerical Analysis Using MATLAB, 2nd Ed., Pearson Education
2. Chapra S.C. and Canale R.P. (2006) Numerical Methods for Engineers, 5th Ed., McGraw Hill
3. N.P. Gopalan, "Web Technology", PHI.
4. Ivan Bayross, "HTML, JavaScript, DHTML, and PHP", BPB Publication.

List of Experiments:

1. Write your first Matlab/Scilab program.
2. Extract an individual element of an array
3. Write Matlab/Scilab program to illustrate loops and control statements.
4. Create a simple plot.
5. Name the title, axes title of the plot.
6. Create a webpage with HTML describing your department on following points: Use paragraph and list tags. Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.
7. Create a web page using HTML for following: Create a table to show your class time-table. Use tables to provide layout to your HTML page describing your university infrastructure.

ITA- 407 Industrial Training –I

Duration:- 2 weeks after the IVsemester in the summer break, Assessment in V semester. Students must observe following to enrich their learning during industrial training:
- Industrial environment and work culture.
- Organizational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.

Sri Satya Sai
University of Technology and Medical Sciences

(Established under Govt. of M.P. Registered under UGC 2(F) 1956)

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Name of Faculty: School of Engineering

Name of Department: Information & Technology

Minutes of Board of Studies Committee Meeting Dated on 04.06.2019

The Board of Studies Committee Meeting was held in the room of Department of Computer Science Engineering at 2:30 PM. on 04.06.2019, Following members were present.

1. Dr. Tryambak Hiwarkar Prof.(Computer Science and Engineering), Chairman

2. Mr. Arif Hakeem Asst. Prof.(Computer Science and Engineering), Member

3. Dr. Anil Kumar Prof. ,(Computer Science and Engineering), Member

4. Mr. Gajendra Singh, Asst. Prof. ,(Information & Technology), Member

5. Mr. Narendra Sharma, Asst. Prof. ,(Information & Technology), Member

6. Mr. Harsh Pratap Asst. Prof. ,(Information & Technology), Member

7. Mr Kailash Patidar Asst. Prof. ,(Computer Science and Engineering), Member

8. Mr. Manoj Yadav Asst. Prof. ,(Computer Science and Engineering), Member

9. Mr. Harsh Lohiya Asst. Prof. ,(Computer Science and Engineering), Member

10. Ms. .Naina Solanki Asst. Prof. ,(Computer Science and Engineering), Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

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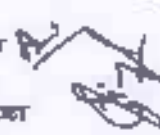**Agenda** Preparation of syllabus as per CBCS Scheme for VIIth and VIIIth Sem.
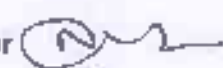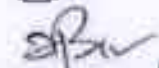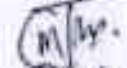
Discussion Scheme

Scheme and syllabus was put before the members as per AICTE guidelines and CBCS Scheme which also met the current demand in Industry, it was discussed in detail by the members and some modifications were suggested.

Resolution of the Discussion

It was resolved that scheme and syllabus for VIIth and VIIIth Sem following AICTE guidelines and CBCS Scheme which also met the current demand in Industry should be modified and may be accepted.

Signature of All members (Including Chairman)

1. Dr. Tryambak Hiwarkar Prof.,(Computer Science and Engineering), Chairman
2. Mr. Arif Hakeem Asst. Prof,(Computer Science and Engineering), Member
3. Dr. Anil Kumar Prof. ,(Computer Science and Engineering), Member
4. Mr. Gajendra Singh, Asst. Prof. ,(Information & Technology), Member
5. Mr. Narendra Sharma, Asst. Prof. ,(Information & Technology), Member
6. Mr. Harsh Pratap Asst. Prof. ,(Information & Technology), Member
7. Mr Kailash Patidar Asst. Prof. ,(Computer Science and Engineering), Member
8. Mr. Manoj Yadav Asst. Prof. ,(Computer Science and Engineering), Member
9. Mr. Harsh Lohiya Asst. Prof. ,(Computer Science and Engineering), Member
10. Ms. .Naina Solanki Asst. Prof. ,(Computer Science and Engineering), Member

Chairman

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Scheme of Examination - CBCS Pattern

Academic Year 2019-2020

Information Technology (VII Semester / IV Year)

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Periods / Hour / Week			Credits	Total Marks
			End Sem. Exam.	Mid Tests	Assignments / Quiz	End Sem. / Practical & Viva / Presentation	Practical Record / Assignment / Quiz	L	T	P		
1	ITC-701	Soft Computing	60	30	10	30	20	2	1	2	4	150
2	ITC-702	Cloud Computing	60	30	10	30	20	2	1	2	4	150
3	ITC-703	Object Oriented Analysis and Design	60	30	10	30	20	2	1	2	4	150
4	ITC-704	Department Elective-V	60	30	10	-	-	2	1	-	3	100
5	ITC-705	Department Elective-VI	60	30	10	-	-	2	1	-	3	100
6	ITC-706	Open Elective	60	30	10	-	-	2	1	-	3	100
7	ITC-707	Industrial Training - II	-	-	-	-	100	-	-	4	2	100
		TOTAL	360	180	60	90	160	12	6	10	23	850

Department Elective-V	Department Elective-VI	Open Elective
ITC-704(A) Cryptography & Information Security	ITC-705(A) Data Mining and Knowledge Discovery	ITC-706(A) Wireless Network
ITC-704(B) Simulation and Modeling	ITC-705(B) E-Commerce and Governance	ITC-706(B) Corel DRAW Graphics
ITC-704(C) Adhoc Network	ITC-705(C) Bioinformatics	ITC-706(C) Knowledge Management

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Scheme of Examination - CBCS Pattern
(M.P)
Academic Year 2019-2020
Information Technology(VIII Semester / IV Year)

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks Practical (Practical Slot)		Periods/ Hour/ Week			Credits	Total Marks
			End Sem. Exam.	Mid Tests	Assign-ments/ Quiz	End Sem./ Practical & Viva / Presentation	Practical Record / Assig / Quiz	L	T	P		
1	ITC-801	Compiler Design	60	30	10	30	20	2	1	2	4	150
2	ITC-802	Web Technology	60	30	10	30	20	2	1	2	4	150
4	ITC-803	Department Elective-VII	60	30	10	-	-	2	1	-	3	100
5	ITC-804	Department Elective-VIII	60	30	10	-	-	2	1	-	3	100
6	ITC-805	Open Elective	60	30	10	-	-	1	1	-	3	100
7	ITC-806	Industrial Training Project - II	-	-	-	50	100	-	-	8	4	150
8	ITC-807	General Proficiency	-	-	-	-	100	-	2	-	2	100
	TOTAL		300	150	50	110	240	10	7	12	23	1350

Department Elective-VII	ITC-803(A) Network Management System	ITC-803(B) Embedded Computer System	ITC-803(C)Advanced Concepts in Database System
Department Elective-VIII	ITC-804 (A)Information Storage & Management	ITC-804(B)PHP Technology	ITC-804(C) High Performance Computing
Open Elective	ITC-805(A) Artificial Intelligence	ITC-805(B) Android Technology	ITC-805(C)- Big Data Analytics

ITC-701
SOFT COMPUTING

UNIT-I

Soft Computing: Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Introduction to Neural Network: Concept, biological neural network, evolution of artificial neural network, McCulloch-Pitts neuron models, Learning (Supervise & Unsupervised) and activation function, Models of ANN-Feed forward network and feedback network, Learning Rules Hebbian, Delta, Perceptron Learning and Windrow-Hoff, winner take all.

UNIT – II

Supervised Learning: Perceptron learning,- Single layer/multilayer, linear Separability, Adaline, Madaline, Back propagation network, RBFN. Application of Neural network in forecasting, data compression and image compression.

UNIT – III

Unsupervised learning: Kohonen SOM (Theory, Architecture, Flow Chart, Training Algorithm) Counter Propagation (Theory, Full Counter Propagation NET and Forward only counter propagation net), ART (Theory, ART1, ART2). Application of Neural networks in pattern and face recognition, Intrusion detection, robotic vision.

UNIT – IV

Fuzzy Set: Basic Definition and Terminology, Set-theoretic Operations, Member Function, Formulation and Parameterization, Fuzzy rules and fuzzy Reasoning, Extension Principal and Fuzzy Relations, Fuzzy If-then Rules, Fuzzy Inference Systems, Hybrid system including neuro fuzzy hybrid, neuro genetic hybrid and fuzzy genetic hybrid, fuzzy logic controlled GA. Application of Fuzzy logic in solving engineering problems.

UNIT – V

Genetic Algorithm: Introduction to GA, Simple Genetic Algorithm, terminology and operators of GA (Individual, gene, fitness, population, data structure, encoding, selection, crossover, mutation, convergence criteria). Reasons for working of GA and Schema theorem, GA optimization problems including JSPP (Job shop scheduling problem), TSP (Travelling salesman problem), Network design routing, timetabling problem. GA Implementation using MATLAB.

REFERENCES:-

1. S.N. Shivnandam, "Principle of soft computing", Wiley
2. Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
3. Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli., PHI Pub.
4. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.

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LIST OF EXPERIMENTS

1. Form a Perceptron Net for basic gates with binary input and output

2. Using ADALINE Net, generate XOR function with bipolar inputs and targets

3. To Study the ADALINE NET and their training algorithm

4. To study the MADALINE NET and their training algorithm

5. Learn pattern, target output, learning rate and activation function

6. Obtain the output of the neuron Y for the network shown in fig; Using activation function as; a|

binary sigmoidal b| binary sigmoidal [x1 x2 x3] = [0.8 0.6 0.4] [y1 y2 y3] = [0.1 0.3 -0.2] b=0.35

7. To implement AND function using Mc-Culloch Pitts neuron model

8. Design fuzzy inference system for a given problem

9. Implement Travelling salesman problem using Genetic algorithm

10. To study the training algorithm of ART

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IT - 702-
CLOUD COMPUTING

UNIT-I

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (Iaas, Paas & Saas).

UNIT-III

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

UNIT-IV

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I , Network security – II, Host security, Disaster recovery and management, Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V

Cloud Solutions: - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds. Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services, Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridg Press, 2010

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LIST OF EXPERIMENTS

1. Creating and working with a new document in Google docs.

2. Preparing a presentation of ten slides on using Google docs.

3. Setting up service for running Hadoop daemons on windows 7

4. Create and Deploy a Cloud Service.

5. Study of Eucalyptus.

6. Installation of Eucalyptus Cloud.

7. Study of CloudsIm.

8. CloudSim setup and installation.

9. Working and installation of Google App Engine.

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ITC- 703
Object Oriented Analysis and Design

UNIT-I

Overview of Object Oriented concepts: Objects and classes, abstraction, generalization and inheritance, encapsulation, multiple inheritance, aggregation abstraction classes, polymorphism, link and association, Need for object oriented approach

UNIT II

System design life cycle, object oriented S/W development process model, Object Oriented Analysis, Object Modeling Technique (OMT): object model, function model, relationship among models, object diagrams, state diagrams, data flow diagrams, analysis.

UNIT III

Object oriented Design: Overview of object design, Combination the models, Designing algorithms, design optimization, implementation of control, Adjustment, Design of association, object representation, physical packaging, documenting design decision, comparison of use-case driven approach.

UNIT IV

Translation Object Oriented design into implementation, Programming style, Documentation, characterization of object oriented languages, Comparison of object oriented language like C++, JAVA, object programming.

UNIT V

Unified Modeling Language (UML): Class diagram sequence diagram Use case diagram, Collaboration, diagram, state, chart diagram, Activity diagram, component diagram, deployment diagram, Object oriented Database: Relational Vs object oriented database, the architecture of object oriented database, query language for Object Oriented database.

REFERENCES:

1. Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process", CENGAGE Learning.
2. Michael Blaha and J. Rumbugh, "Object oriented Modeling and design with UML", Pearson Education
3. O'Docherty, "Object Oriented Analysis and Design Understanding, System Development with UML2.0", Wiley India.

List of Experiment:-

1. Draw Object, state, Data flow Diagram of ATM.
2. Draw Object, state, Data flow Diagram of Telephone Call.
3. Draw Object, state, Data flow Diagram of Library Information System.
4. Draw Object, state, Data flow Diagram of Airline reservation System.
5. Draw Object, state, Data flow Diagram of Calculator, Draw Object, state, Data flow Diagram of College Management system.
6. Draw Object, state, Data flow Diagram of Payroll System, Draw Object, state, Data flow
7. Diagram of Railway Reservation system, Draw Object, state, Data flow Diagram of Online Sales
8. Draw Object, state, Data flow Diagram of Examination result display System of a University.

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ITC-704(A)

Cryptography & Information Security

UNIT I

E-security & Cryptography Threats, risks, consequences, Sources of threats, Attacks classification, Preventive measures, remedial measures. Stream ciphers vs. block ciphers, Keys and key management Key exchange (peer to peer, peer - keyserver - peer) Diffie Helman key sharing scheme Symmetric key cryptography vs asymmetric key cryptography Trapdoor functions

UNIT II

Hash digests: Properties of cryptographic hash functions, Merkle Damgard construction, md family, sha family, Digital signatures, sha3

UNIT III

GPG: Overview of GPG Commands and CLI , GPG trust model, GUI – KGPG, Seahorse Frontends – Kleopatra, enigmail.

UNIT VI

Block ciphers: Block cipher principles, Feistel networks, S boxes and P boxes, Block cipher modes of operation, DES , 3DES, AES.

UNIT V

Elementary number theory: Prime numbers, Factoring., Modular arithmetic, Fermat's & Euler's theorems, GCD, Euclid's algorithm, Discrete logarithm problem, Public key crypto systems, RSA algorithm, Elliptic Curve cryptography

REFERENCE BOOKS

1. William Stallings, *Cryptography and network security*, Pearson Educa- tion.
2. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone , *Hand- book of Applied Cryptography*, CRC Press.
3. Margaret Cozzens, Steven J Miller, *The mathematics of encryption*, American Mathematical Society
4. Bruce Schneier *Applied Cryptography*, John Wiley and Sons
5. Mark Stamp, *Information Security: Principles and Practice*, John Wi- ley and Sons
6. Matt Bishop, *Computer Security, Art and Science*, Pearson Education

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ITC-704(B)
Simulation and Modeling

Unit-I
Introduction to Modeling and Simulation

Nature of Simulation. Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, concept of simulation, Components of a simulation study, Principles used in modeling Static and Dynamic physical models, Static and Dynamic Mathematical models Introduction to Static and Dynamic System simulation , Advantages ,Disadvantages and pitfalls of Simulation.

Unit-II
System Simulation and Continuous System Simulation

Types of System Simulation, Monte Carlo Method, Comparision of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, Digital- Analog Simulators, Continuous system simulation languages ,Hybrid simulation ,Real Time simulations,

Unit —III
System Dynamics & Probability concepts in Simulation

Exponential growth and decay models, logistic curves ,Generalization of growth models , System dynamics diagrams, Multi segment models , Representation of Time Delays. Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

Unit-IV
Simulation of Queueing Systems and Discrete System Simulation

Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing

Disciplines, Simulation of single and two server queue. Application of queuing theory in computer system. Discrete Events ,Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization, Recording Distributions and Transit times .

Unit-V
Introduction to Simulation languages and Analysis of Simulation output

GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements . SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements . Estimation methods , Relication of Runs, Batch Means , Regenerative techniques , Time Series Analysis , Spectral Analysis and Autoregressive Processes.

REFERENCES BOOKS:
1. Gorden G., System simulation, Prentice Hall.
2. Seila, Simulation Modeling, Cengage Learning
3. Law .,Simulation Modeling And Analysis, McGraw Hill
4. Deo, System Simulation with Digital Computer, PHI
5. Harrington, Simulation Modeling methods, McGraw Hill
6. Severance, " System Modeling & Simulation, Willey Pub
7. Working in Cloud to demonstrate different language.

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ITC-704(C)
ADHOC NETWORK

UNIT I

Introduction:- Introduction-Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, GSM, GPRS, PCS, WLAN and UMTS, Components of Packet Radios, Routing in PRNETs, Ad Hoc Wireless Networks, Wireless Sensor Networks, Traffic Profiles, Types of Ad Hoc Mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad Hoc Mobile Networks.

UNIT II

Ad Hoc wireless MAC protocols:- Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Ad Hoc Routing Protocols- Introduction, Classifications of Routing Protocols: Table-Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR) Location Aided Routing (LAR).

UNIT III

Multicast routing in Ad Hoc Networks:- Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh- Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting.

UNIT IV

Transport Layer, Security Protocols:- Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management.

UNIT V

QoS and Energy Management: -Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classifications of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, Energy Management in Ad Hoc Wireless Networks – Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes.

REFERENCES BOOKS:-

1. C. Siva Ram Murthy and B.S. Manoj "Ad Hoc Wireless Networks: Architectures and Protocols", Pearson Education.
2. C.K. Toh, "Ad Hoc Mobile Wireless Networks: Protocols and Systems", Pearson Education.

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ITC-705(A)
DATA MINING AND KNOWLEDGE DISCOVERY

UNIT I

Data Mining:- Basic concept ,technology and rules, DM techniques, Mining problems, Issues and Challenges in DM, application of data mining, KDD v/s Data Mining, DBMS v/s Data Mining, DM Application areas. Data mining techniques: Exploration of data mining methodologies, decision tables, decision trees, classification rules, association rules, clustering,statistical models & linear models.

UNIT II

Mining Association Rules in Large Databases:- Association Rule Mining, Single Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, FpGrowth Algorithm, Time series mining association rules, latest trends in association rules mining.

UNIT III

Rules & Clustering Techniques:- Introduction, Various association algorithms like A Priori, Partition, Pincer search etc. Clustering paradigms; Partitioning algorithms like K- Method, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; Categorical Clustering algorithms, STIRR, ROCK, CACTUS.

UNIT IV

Data Mining of Image and Video:- A case study. Image and Video representation techniques, feature extraction, motion analysis, content based Image and video retrieval, clustering and association paradigm, knowledge Web mining: Introduction to web mining techniques, web basics and HTTP, data sources on the web, personalization, working with logs, forms and cookies, user identification and path analysis, E-Metrics.

UNIT V

Data Warehousing:- Need for data warehousing , Basic elements of data warehousing, Data Mart, Data Warehouse Architecture, extract and load Process, Clean and Transform data, Star, Snowflake and Galaxy Schemas for Multidimensional databases, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning.

REFERENCES:-

1. Han, Kamber, "Data Mining Concepts & Techniques".
2. M.Kaufman. Data Mining Techniques; Arun K.Pujari ; University Press.
3. Mastering Data Mining; Berry Linoff; Wiley
4. Data Mining: Adriaans & Zantinge; Pearson education.

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ITC-705(B)
E-COMMERCE AND GOVERNANCE

UNIT I

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal, environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

UNIT II

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

UNIT III

E-Government, theoretical background of e-governance, Issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, Interactive services / G2C2G.

UNIT IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e-governance, e-seva.

UNIT V

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

REFERENCES:-

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-govemence: concept and case study", PHI Learning Private Limited.
3. V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4. David Whiteley, "E-commerce study, technology and applications", TMH.

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ITC-705(C)
BIOINFORMATICS

UNIT-I

Introduction:-Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

UNIT-II

Bioinformatics Databases & Image Processing :- Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, protein purification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

UNIT-III

Sequence Alignment and database searching:- Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

UNIT-IV

Gene Finding and Expression:- Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data.

UNIT-V

Proteomics & Problem solving in Bioinformatics:- Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation. E- cell, Genomic analysis for DNA & Protein sequences, Strategies and options for similarity search, flowcharts for protein structure prediction .

REFERENCES:

1. Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics & Proteomics, TMH Pub
2. Rastogi, BioInformatics –Concepts, skills & Applications, CBS Pub
3. Bergeron, BioInformatics computing, PHI
4. Claverie, Bioinformatics, Wiley pub

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ITC-706(A)
WIRELESS NETWORK

UNIT – I

Introduction of Wireless Networks, wireless network architectures, Different Generations of Wireless Networks, Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modeling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modeling Techniques. Narrowband digital modulation and Coding under wireless fading environments.

UNIT – II

Introduction WLAN technologies:- Infrared, UHF narrowband, spread spectrum IEEE802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM,BRAN, HiperLAN2 – Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security IEEE802.16WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX.

UNIT – III

Network Planning: Introduction, Wireless Network Topologies, Cellular Topology, Cell Fundamentals, Signal to Interferences Radio Calculations, Network Planning for CDMA Systems. Wireless Network Operations: Mobility Management, Radio Resources and Power Management.

UNIT – IV

Introduction Mobile IP:- IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6 Network layer in the Internet Mobile IP session initiation protocol mobile adhoc network: Routing, Destination Sequence distance vector, Dynamic source routing. MOBILE TRANSPORT LAYER TCP enhancements for wireless protocols Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP, TCP over 3G wireless networks.

UNIT – V

IEEE 802.15 WPAN, Home RF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5G and 3G Networks., 3GSGSN, 3GGGSN, SMSGMSC/ SMS/WMSC, Firewall, DNS/DHCP High speed Downlink packet access (HSDPA) LTE network architecture and protocol. 4G NETWORKS Introduction – 4G vision – 4G features and challenges Applications of 4G – 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDMMIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.

REFERENCES:

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.
2. Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011,
3. Simon Haykin, Michael Moher, David Koilpillai, "Modern Wireless Communications", First Edition, Pearson Education 2013

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ITC-708(B)
Corel DRAW Graphics

UNIT I

Basics of CorelDraw, such as creating and saving documents, using fonts, resizing, rotating and moving documents and getting help. Create a report cover that contains a page border, an image from a symbol font, a title in artistic text and paragraph text. Font usage, design identification tools in the toolbox and use several common tools to create a half-page flyer for a party invitation. Ways to apply color to an object and/or its outline, reflective vs. direct color and how this relates to RGB and CMYK colors and screen vs. printed colors.

UNIT II

Basics of using vector graphics and node editing for graphics and text, multi-page layouts and the Print Preview dialog, and import and edit clipart, combine vector and bitmap images as they create a standard page (letter/A4). Corel PHOTO-PAINT* program works with CorelDraw. Editing a photo might be deemed deceitful, digital photography techniques in photography.

UNIT III

Templates: open an existing template file, modify it and create their own templates. Creating a two-page newsletter, use text in columns, flow text from column-to-column and page-to-page, wrap text around graphics and create drop caps. Use of Lorem Ipsum text, possible modern replacements, and the difference between newsletters, blogs and other social media in usage and design. ,work with bitmap and vector effects, layers, lenses and masks, while creating a collage of images and text on a chosen topic.

UNIT IV

Design and automation processes as they create a personal letterhead suite that includes mailing labels. Print Merge/Data Merge capabilities of CorelDraw, Interactive Fill Tool. Use of personalized mailings in marketing and other areas. Page Layout dialog, brochure designs and creating promotional materials, tools for text and graphics creation, page layout options, Extrude and Bevel tools.

UNIT V

3D effects to text and objects using Callouts and Connectors for creating charts, the Ellipse tool to draw pie shapes and Table and Paragraph formatting tools for layout, slideshow that includes charts, graphs and 3D bitmap effects, macro in CorelDRAW to create a 12-month pictorial calendar. Identifying the difference between a Macro and a Script, learning how to write a script, and considering safety issues surrounding the usage of downloaded scripts.

REFERENCE BOOKS:

1. Corel Draw X8: The Official Guide by Garry David Bouton
2. Corel Draw X3 ,by LP Editorial Board
3. Coreldraw X7 ,by VISHNU P. SINGH

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ITC-706(C)
KNOWLEDGE MANAGEMENT

Unit 1: Overview of Knowledge Management:
Introducing Knowledge Management, Need for Knowledge Management, Valuation of Intellectual Capital, Intellectual Capital: Human vs. Structural Capital, Forces Driving Knowledge Management, Knowledge Management Systems, Issues in Knowledge Management

Unit 2: The Nature of Knowledge:
What is Data, Information ?, What is Knowledge?, Data, Information, and Knowledge with Examples, Types of Knowledge, Subjective View of knowledge, Objective View of Knowledge, Procedural vs. Declarative Knowledge, Tacit vs. Explicit Knowledge, General vs. Specific Knowledge, Technically vs. Contextually Specific Knowledge, Knowledge and Expertise, Types of Expertise, Types of Knowledge, Codifiability and Teachability of Knowledge, Specificity of Knowledge, Reservoirs of Knowledge, Characteristics of Knowledge,

Unit 3: Technologies to Manage Knowledge:
Artificial Intelligence and Understanding Knowledge: Cognitive Psychology , Data, Information and Knowledge , Kinds of Knowledge, Expert Knowledge, Thinking and Learning In Humans , Knowledge vs Intelligence, dumb search, Heuristic search in Knowledge-Based Systems, Knowledge Based Systems for KM, What kinds of knowledge are in Knowledge-Based Systems?, Knowledge Based Systems vs Expert Systems, Advantage and disadvantage of Knowledge Based Systems vs Expert Systems.

Unit 4: Knowledge Management Systems Life Cycle:
Challenges in KM Systems Development, Conventional Vs KM Systems Life Cycle(KMSLC), Key Differences , Key Similarities, KMSLC Approaches .

Unit 5: Knowledge Creation & Knowledge Architecture:
Knowledge Creation, Nonaka's Model of Knowledge Creation & Transformation, Knowledge Architecture , Acquiring the KM System.

TEXTBOOK:
1. Knowledge Management in Theory and Practice - 2nd edition by Kimiz Dalkir:
2. Knowledge Management Paperback – 2007 by Shelda Debowski

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ITC – 707 Industrial Training - II

Students must observe following points to enrich their learning in electrical engineering during industrial training:

- The training must be the advance/ different already done on minor training.
-Industrial environment and work culture.
- Organizational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.
- Quality control and assurance.
- Maintenance system.
- Costing system.
- Stores and purchase systems.
- Roles and responsibilities of different categories of personnel.
- Customer services.
-Problems related to various areas of Work etc.
- Layout if any

To be submitted : The students has to submit the power point presentation of minimum 15 slides of the training performed (comprising of points stated above) along with the original certificate of training performed with proper seal and signature of the authorized person.

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ITC-801
COMPILER DESIGN

UNIT-I

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer.

UNIT-II

The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT-III

Bottom—Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

UNIT-IV

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

UNIT-V

Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

REFERENCE BOOKS:

1. Principles of compiler design -A.V. Aho , J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
3. A. C. Holub, Compiler Design in C , Prentice-Hall Inc., 1993.
4. Raghavan, Compiler Design, TMH Pub.

LIST OF EXPERIMENTS:

1. Develop a lexical analyzer to recognize a few patterns.
2. 2.Write a programme to parse using Brute force technique of Topdown parsing.
3. Develop LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser
6. Write a program for generating for various Intermediate code forms i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. 9 Generate YACC specifications for a few syntactic categories.
10. 10 Given any Intermediate code form Implement code optimization techniques

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ITC-802
WEB TECHNOLOGY

UNIT-I

History of the Internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains, Introduction to World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway Interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

UNIT-II

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations, DTD files and basics of Cascading Style Sheet (CSS),Document object Model (DOM) history and levels, Document tree, DOM event handling.

UNIT-III

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java.

UNIT-IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, Introduction to Apache web server, Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall, Middleware Concepts, CORBA, Java Remote Method Invocation (RMI), Message Oriented Middleware (MOM), EJB, Microsoft's Distributed Component Object Model(DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

UNIT-V

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP, Setting up an Open Data Base Connectivity (ODBC) data source.

References:-
1. J. C. Jackson, Web Technologies: A computer science perspective, Pearson Education.
2. A. S. Godbole & A. Kahate, Web Technologies: TCP/IP Architecture, and Java Programming, TMH.
3. Paul S. Wang Sanda, S Katila, An Introduction to Web Design, Programming, CENGAGE Learning.
4. N.P.Gopalan, J.Akilandeswari, Web Technology: A developer's Perspective, PHI Learning.

LIST OF EXPERIMENTS:

1. Adapt HTML and CSS syntax and semantics to build web pages.
2. Construct and visually format tables and forms using HTML and CSS
3. Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
4. Appraise the principles of object oriented development using PHP
5. Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

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Department Elective VII
IT-803(A)
NETWORK MANAGEMENT

UNIT-I
Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration, Selected Management Strategy.

UNIT –II
Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View, Remote Monitoring (RMON), RMON Group, Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents, Setting up LAN Access, SNMP Configuration.

UNIT-III
Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

UNIT-IV
Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing UNIT, Classless Addressing: CIDR, Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package, Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP, Private Networks, Virtual Private Network (VPN), Network Address Translation (NAT).

UNIT –V
Internet Control Message Protocols (ICMP):-Types of message, message format, error reporting, query, checksum, ICMP Package, IGMP, IGMP Message and its Operation, IGMP Package, Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers, TCP Operation, TCP Package, Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

REFERENCES:
1.Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2.Stevens, TCP/IP Illustrated Volume-I, Pearson
3.J.Richard Burkav, Network Management Concept and Practice, PHI

Department Elective VII
ITC-803 (b)
Embedded Computer Systems

UNIT – I

Introduction to Embedded systems

Embedded Systems Vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Purpose of Embedded systems ,Core of the Embedded system, Memory, Sensors and Actuators, Communication Interface, Embedded firmware, PCB and Passive Components, Characteristics and Quality attributes of a Embedded System .

UNIT – II

Design of Embedded Systems with 8bit Microcontrollers-8051

Factors for considering in selecting a Controller ,Designing with 8051 microcontroller Different addressing modes supported by 8051 , Instruction set for 8051 microcontroller, Fundamental Issues in Hardware Software Co-Design , Computational models in Embedded Design .

UNIT – III

Embedded Hardware & Firmware Design and Development

Analog &Digital Electronic components, VLSI & Integrated circuit design, Electronic Design Automation tools , PCB layout Design and its fabrication .Embedded firmware design approaches , Embedded firmware Development Languages ,Programming in Embedded C , Integration and testing of Embedded Hardware and Firmware , Safe & robust Design, Reliability, Faults, errors & Failure, Functional Design, Architecture Design, Prototyping.

UNIT –IV

Embedded System Development Environment

Integrated Development Environment (IDE) , Types of files Generated on CrossCompilation , Disassembler / Decompiler, Simulators, Emulators and Debugging, Boundary Scan.

UNIT – V

Embedded Product Development Lifecycle(EDLC) and Trends in Embedded Industry

What is EDLC ,Objectives of EDLC , Different phases of EDLC , EDLC Approaches-Linear or waterfall model , Iterative Model , Prototyping/Evolutionary Model, Spiral Model . Processor trends in Industry , Embedded OS Trends , Development Language trends Open Standards, Frameworks and Alliances , Bottlenecks.

References:

1. Shibu, Introduction to Embedded System:, TMH
2. Barrett ,Embedded Systems :Design and Applications ,Pearson Education
3. Rajkamal, Embeded System, TMH
4. Vahid ,Givargis ,Embedded System Design ,Wiley
5. Balbno, Embedded Micro Computer System Cengage Learning
6. Siewert, Real Time Embeded System & Components, Cengage Learning
7. Peckol, Embeded System, Willey Indi

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UNIT I
An overview of database, The Extended Entity Relationship Model and Object Model: The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

UNIT II
Query Processing, Optimization & Database Tuning: Algorithms For Executing Query Operations, Heuristics For Query Optimizations, Estimations of Query Processing Cost, Join Strategies for Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering & Indexing, Multiple Attribute Search Keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue in RDBMS.

UNIT III
Distributed Database System: Structure of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel & Pipeline Join, Distributed Query Processing In R * System, Concurrency Control In Distributed Database System, Recovery In Distributed Database System, Distributed Deadlock Detection and Resolution, Commit Protocols.

UNIT IV
Enhanced Data Model For Advanced Applications: Database Operating System, Introduction to Temporal Database Concepts, Spatial And Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues In Real Time Database Design.

UNIT V
Accessing databases from Web, JavaScript, JDBC, Java Servlets , database technology to Web related areas such as semi-structured databases and data integration, XML, XQuery, XPath, XML Schemas, distributed database design, distributed database transactions, and distributed query processing

REFERENCES:-
1. Majumdar & Bhattacharya, "Database Management System", TMH.
2. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley.
3. Korth, Silbertz, Sudarshan, " Database Concepts", McGraw Hill.
4. David M. Croenke and David J. Auer "Database Processing" Eleventh Edition, PHI
5. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill.
6. Peter Rob and Coronel, "Database Systems, Design, Implementation and Management", Cengage Learning
7. Data C J," An Introduction To Database System", Addison Wesley.
8. Bernstein, Hadzilacous, Goodman, "Concurrency Control & Recovery", Addison Wesley.

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UNIT-I

Introduction: - Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Data creation and The value of data to a business, Information Lifecycle Management, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Center infrastructure, Data categorization.

UNIT-II

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

UNIT-III

Introduction To Networked Storage: - Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, IP-SAN, Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN. Introduction to Information Availability: - Business Continuity and Disaster Recovery Basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles & techniques.

UNIT-IV

Managing & Monitoring: - Management philosophies (holistic vs. system & component), Industry management standards (SNMP, SMI-S, CIM), Standard framework applications, Key management, Metric analysis methodologies & trend analysis, Reactive and pro-active management best practices, Provisioning & configuration change planning, Problem reporting, prioritization, and handling techniques, Management tools overview.

UNIT-V

Securing Storage and Storage Virtualization: - Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

REFERENCE BOOKS:

1. EMC Corporation, Information Storage and Management, Wiley, India.
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill , Osborne, 2003.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill ,Osborne, 2001.
4. Additional resource material on www.emc.com/resource-library/resource-library.esp

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Department Elective VIII
ITC-804 (B)
PHP TECHNOLOGY

UNIT-I

Introduction to PHP:-Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression.

Handling HTML Form With PHP:- Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form , Redirecting a form after submission.

UNIT-II

Decisions and loop:- Making Decisions, Doing Repetitive task with looping , Mixing Decisions and looping with Html.

Function:- What is a function, Define a function, Call by value and Call by reference, Recursive function.

UNIT-III

String:- Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function.

Array:- Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function.

UNIT-IV

Working with file and Directories:-Understanding file& directory ,Opening and closing a file, Coping ,renaming and deleting a file , Working with directories, Building a text editor , File Uploading & Downloading.

State management-Using query string(URL rewriting), Using Hidden field ,Using cookies, Using session .

UNIT-V

String matching with regular expression:-What is regular expression, Pattern matching in Php , Replacing text ,Splitting a string with a Regular Expression.

Generating Images with PHP:- Basics of computer Graphics, Creating Image , Manipulating Image, Using text in Image

References:

- (i.) Learning PHP, MySQL, books by _ O" riley Press
- (ii.) PHP & MySQL: Novice to Ninja by Kevin Yank
- (iii.) PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman

BE(IT)-VIII

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List of Experiments:-

1. Write a program to print Factorial of any number.

2. Write a program in PHP to print Fibonacci series.

3. Write a program to find whether a number is Armstrong or not.

4. Write a program to print Reverse of any number.

5. Write a program to print Reverse of any number.

6. Write a program to check whether a number is Prime or not.

7. Program to find whether a year is LEAP year or not.

8. Write a Program for finding the biggest number in an array without using any array functions.

9. Write a Program to swap two numbers in PHP.

10. Write a Program for finding the smallest number in an array

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UNIT I

Introduction: Computational Science and Engineering: Computational Science and Engineering Applications; characteristics and requirements, Review of Computational Complexity, Performance: metrics and measurements, Granularity and Partitioning, Locality: temporal/spatial/stream/kernel, Basic methods for parallel programming, Real-world case studies (drawn from multi- scale, multi-discipline applications)

UNIT II

High-End Computer Systems : Memory Hierarchies, Multi-core Processors: Homogeneous and Heterogeneous, Shared-memory Symmetric Multiprocessors, Vector Computers, Distributed Memory Computers, Supercomputers and Petascale Systems, Application Accelerators / Reconfigurable Computing, Novel computers: Stream, multithreaded, and purpose-built

UNIT III

Parallel Algorithms: Parallel models: ideal and real frameworks, Basic Techniques: Balanced Trees, Pointer Jumping, Divide and Conquer, Partitioning, Regular Algorithms: Matrix operations and Linear Algebra, Irregular Algorithms: Lists, Trees, Graphs, Randomization: Parallel Pseudo-Random Number Generators, Sorting, Monte Carlo techniques

UNIT IV

Parallel Programming: Revealing concurrency in applications, Task and Functional Parallelism, Task Scheduling, Synchronization Methods, Parallel Primitives (collective operations), SPMD Programming (threads, OpenMP, MPI), I/O and File Systems, Parallel Matlabs (Parallel Matlab, Star-P, Matlab MPI), Partitioning Global Address Space (PGAS) languages (UPC, Titanium, Global Arrays)

UNIT V

Achieving Performance: Measuring performance, Identifying performance bottlenecks, Restructuring applications for deep memory hierarchies, Partitioning applications for heterogeneous resources, using existing libraries, tools, and frameworks

Text Books:

1. **Introduction to Parallel Computing,** AnanthGrama, Anshul Gupta, George Karypis and Vipin Kumar, 2nd edition, Addison-Welsey, 2003.
2. **Petascale Computing:** Algorithms and Applications, David A. Bader (Ed.), Chapman & Hall/CRC Computational Science Series, 2007

Reference Books:

1. An Introduction to Parallel Computing, Design and Analysis of Algorithms: Grama, A Gupta, G. Karypis, V. Kumar, 2/e, Addison-Wesley, 2003.
2. G.E. Karniadakis, R.M. Kirby II, Parallel Scientific Computing In C++ and MPI: A Seamless Approach to Parallel Algorithms and their Implementation, Cambridge University Press, 2003.
3. Wilkinson and M. Allen, Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers, 2/E, Prentice Hall, 2005.
4. Parallel Programming in C with MPI and OpenMP, McGraw-Hill, 2004. G.S. Almasi and A. Gottlieb, Highly Parallel Computing, 2/E, Addison-Wesley, 1994.
5. Kai Hwang, "Scalable Parallel Computing", McGraw Hill 1998.

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ITC-805 (A)
ARTIFICIAL INTELLIGENCE

UNIT I

Meaning and definition of artificial Intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A* algorithm, AO* algorithms etc, and various types of control strategies.

UNIT II

Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and nonmonotonic reasoning.

UNIT III

Probabilistic reasoning, Baye's theorem, Semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

UNIT IV

Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

UNIT V

Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

REFERENCES:-

1 Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
2 Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin.

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ITC 805 (B)
ANDROID TECHNOLOGY

UNIT I

Introduction: What is Android, Android versions and its feature set The various Android devices on the market , The Android Market application store ,Android Development Environment - System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs)

UNIT II

Android Architecture Overview and Creating an Example Android Application: The Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stooping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files,

UNIT III

Android Software Development Platform
Understanding Java SE and the Dalvik Virtual Machine , The Directory Structure of an Android Project , Common Default Resources Folders , The Values Folder , Leveraging Android XML, Screen Sizes , Launching Your Application: The AndroidManifest.xml File ,
Creating Your First Android Application

UNIT IV

Android Framework Overview
Android Application Components, Android Activities: Defining the UI, Android Services: Processing In the Background, Broadcast Receivers: Announcements and Notifications Content Providers: Data Management, Android Intent Objects: Messaging for Components
Android Manifest XML: Declaring Your Components

UNIT V

Understanding Android Views, View Groups and Layouts
Designing for Different Android Devices, Views and View Groups, Android Layout Managers, The View Hierarchy, Designing an Android User Interface using the Graphical Layout Tool.

Reference Books:

1. **Android** App Development for Dummies.
2. Head First **Android** Development.
3. Hello, **Android**: Introducing Google's Mobile Development Platform.
4. Professional Android 4th edition.

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ITC 805 (C)
BIG DATA ANALYTICS

UNIT – 1

Hadoop Distributed File System Basics, Running Example Programs and Benchmarks, Hadoop MapReduce Framework, MapReduce Programming

UNIT – 2

Essential Hadoop Tools, Hadoop YARN Applications, Managing Hadoop with Apache Ambari, Basic Hadoop Administration Procedures

UNIT – 3

Business Intelligence Concepts and Application, Data Warehousing, Data Mining, Data Visualization

UNIT – 4

Decision Trees, Regression, Artificial Neural Networks, Cluster Analysis, Association Rule Mining

UNIT – S

Text Mining, Naïve-Bayes Analysis, Support Vector Machines, Web Mining, Social Network Analysis

TEXT BOOKS:

1. Douglas Eadline,"Hadoop 2 Quick-Start Guide: Learn the Essentials of Big Data Computing in the Apache Hadoop 2 Ecosystem", 1"Edition, Pearson Education, 2016. ISBN-13: 978-9332570351

2. Anil Maheshwari, "Data Analytics", 1" Edition, McGraw Hill Education, 2017. ISBN-13: 978-9352604180

REFERENCE BOOKS:

3. Tom White, "Hadoop: The Definitive Guide", 4ᵗʰ Edition, O'Reilly Media,

4. Boris Lublinsky, Kevin T.Smith, Alexey Yakubovich,"Professional HadoopSolutions",

5. Eric Sammer,"Hadoop Operations: A Guide for Developers and Administrators"

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ITC – 806 INDUSTRIAL TRAINING PROJECT – II

Industrial Training Project - II should be the outcome of the training done/performed during after 7th semester . It should be submitted in hardware form (proto type)or simulation form along with proper data and certificates issued during project training. It should cover the electrical engineering aspects learned during training. A Power point presentation should also be submitted at the time of submission. It can be in the form of major project.

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ITC- 807 General Proficiency

This course objective is to develop the ability to handle all the tasks associated with the job and Ethics refers to behavior that adheres to societal norms and human conscience. In other words, a way of working that is honest and transparent.

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Ref. No.: SSSDoS/SoE/IT/01

Date: 08-06-2020

Name of Faculty: **School of Engineering**

Name of Department: **Information Technology**

Meeting of Board of Studies of Department of Information Technology was conducted in online mode through Microsoft Team at 1:30 PM. On 08-06-2020, Following members were present.

1.	Dr. Rajeev Pandey UIT R.G.P.V. Bhopal	External Member
2.	Dr. Sanjay Sharma OIST Bhopal	External Member
3.	Mr. Arif Hakeem, Asst. Prof. (CSE)	Chairman
4.	Dr. Jitendra Sheetlani Asst. Prof (CSE)	Member
5.	Mr. Gajendra Singh , Asst. Prof. (IT)	Member
6.	Mr. Gaurav Kumar Saxena, Asst. Prof. (IT)	Member
7.	Mr. Harsh Lohiya, Asst. Prof. (CSE)	Member
8.	Mr. Harsh Pratap Singh Asst. Prof. (IT)	Member
9.	Ms. Naina Solanki, Asst. Prof. (IT)	Member
10.	Mr. Manoj Verma, Asst. Prof. (IT)	Member
11.	Mr. Narendra Sharma, Asst. Prof. (CSE)	Member

Minutes of Meeting:

1. The Chairman of Board of Studies Committee welcomes and addressed the members and introduced external BOS Members to the Board.
2. Address by chair regarding the rationale for the proposal of Scheme and Syllabus based on AICTE Model curriculum for 5th to 8th Semester
3. Chairman of the Board of Studies explained the guidelines, commonalities, workshop to suit discipline requirements and uniqueness.
4. Proposed Scheme and syllabus 5th to 8th semester is presented by chair and following issue has been discussed and resolved.

    I.   Chairman of Board of Studies Committee expressed their concern about motivating students towards domain specific courses in 3rd semester and discuss about 4th semester courses like ecology and environment and other necessary courses.

    II.   Dr. Rajeev Pandey gathered the information and suggested to include some sensors based chapter as a part of curriculum keeping in view the utility of IOT in near future.

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Ref. No. : SSSBoS/SsiE/IT/01   Date : 08-06-2010

III.   Contents of core electives course should be revisited keeping in view of present and future demand in Computer Science and Engineering, suggested by Dr. Sanjay Sharma .

IV.   Mr. Arif Hakeem gives their concern over Emerging and Enduring Fields, Areas identified for Additional Training, Emerging and Enduring Tools and Techniques required for the Information & Technology graduates to meet the global challenges in the next 10 to 20 years

     Keeping in view the suggestions of BOS member as above. The final syllabus is prepared and mailed to all. No BOS member raise any objection. Hence ,the syllabus and scheme of 5th to 8th semester are hereby approved.

     The Chairman thanks the member for cooperation, their suggestions and peaceful conduction of meeting.

Signature of All members (Including Chairman)

1. Dr. Rajeev Pandey UIT R.G.P.V. Bhopal External Member
2. Dr. Sanjay Sharma OIST Bhopal External Member
3. Mr. Arif Hakeem, Asst. Prof. (CSE) Chairman
4. Dr. Jitendra Sheetlani Asst. Prof (CSE) Member
5. Mr. Gajendra Singh , Asst. Prof. (IT) Member
6. Mr. Gaurav Kumar Saxena, Asst. Prof. (IT) Member
7. Mr. Harsh Lohiya, Asst. Prof. (CSE) Member
8. Mr. Harsh Pratap Singh Asst. Prof. (IT) Member
9. Ms. Naina Solanki, Asst. Prof. (IT) Member
10. Mr. Manoj Verma, Asst. Prof. (IT) Member
11. Mr. Narendra Sharma. Asst. Prof. (CSE)

Chairman

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SCHOOL OF ENGINEERING
SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES
Outcome based Curriculum for
Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

V SEMESTER

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Total Marks	Periods/ hour / week			Credits
			End Sem. Exam.	Mid Tests	Assignments/Quiz	End Sem Practical & Viva	Practical Record /Assignment / Quiz / Presentation		L	T	P	
1	ITA-501	Microprocessor & Interfacing	60	30	10	30	20	350	2	1	2	4
2	ITA-502	Computer Graphics	60	30	10	30	20	150	2	1	2	4
3	ITA-503	Java Programming	60	30	10	30	20	150	2	1	2	4
4	ITA-504	Program Elective-1	60	30	10	-		100	1	1	0	4
5	ITA-505	Open Core Elective - 1	60	30	10	-		100	3	1	0	4
6	ITA-506	Industrial Training-1			50	150	50	250			1	2
		TOTAL	300	150	100	240	110	900	12	5	10	22

Program Elective-1	ITA-504(A) Software Engineering	ITA-504(B) Simulation & Modeling
Open Core Elective - 1	ITA-505(A) E-Commerce & Governance	ITA-505(B) Information Theory & Coding

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VI SEMESTER

S.No.	Subject Code	Subject Name	Maximum Marks Theory Slot			Maximum Marks (Practical Slot)		Total Marks	Periods/hour/week			Credits
			Unit Sem. Exam.	Mid Tests	Assignments/Quiz	End Sem. Practical & Viva	Practical Record /Assignment/ Quiz / Presentation		L	T	P	
1	ITA-601	Compiler Design	60	30	10	30	20	150	2	1	2	1
2	ITA-602	Computer Network	60	30	10	30	20	150	2	1	2	1
3	ITA-603	Program Elective-II	60	30	10			100	3	1	0	1
4	ITA-604	Program Elective-III	60	30	10	-		100	3	0	0	1
5	ITA-605	Open Core Elective - II	60	30	10	-		100	3	0	0	1
6	ITA-606	Minor Project	-	-	-	200	100	300	-	-	4	2
		TOTAL	300	150	50	260	140	900	13	3	8	20

Program Elective-II	ITA-603(A) Distributed System	ITA-603(B) Digital Image Processing
Program Elective-III	ITA-604 (A) Data Mining and Data Warehousing	ITA-604(B) Soft Computing
Open Core Elective - II	ITA-605(A) PHP Technology	ITA-605(A) Cyber Law & Ethics

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Scheme of Examination - AICTE Pattern

Undergraduate Degree Courses in Engineering & Technology

Bachelor of Engineering (Information and Technology)

VII SEMESTER

S.No	Subject Code	Subject Name	Maximum Marks Theory Slot				Maximum Marks (Practical Slot)		Total Marks	Periods/hour/week.			Credits
			End Sem. Exam	Mid Tests	Assignments/ Quiz	End Sem. Practical & Viva	Practical Record /Assignment/ Quiz / Presentation			L	T	P	
1	ITA-701	Ad-hoc and Sensor Networks	60	30	10	30	20	150	3	0	2	4
2	ITA-702	Cloud Computing	60	30	10	30	20	150	3	0	2	4
3	ITA-703	Program Elective-IV	60	30	10			100	3	0	0	3
4	ITA-704	Open Core Elective - III	60	30	10			100	3	0	0	3
5	ITA-705	Project Stage-I				100	100	200			10	5
6	ITA-706	Self-Study /GD/Seminar					200	200			2	1
	TOTAL		240	120	40	160	340	900	12	0	16	20

ITA-703	(A) Object Oriented Analysis and Design
	(B) Neural Networks

Program Elective-IV

ITA-704	(A) Information and Storage Management
	(B) Optimization Techniques

Open Core Elective-III

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Scheme of Examination - AICTE Pattern

Undergraduate Degree Courses in Engineering & Technology

Bachelor of Engineering (Information and Technology)

VIII SEMESTER

S.No	Subject Code	Subject Name	Maximum Marks Theory Slot				Maximum Marks (Practical Slot)	Total Marks	Periods/ hour/ week			Credits
			End Sem. Exam	Mid Sem. Tests	Assign-ments/ Quiz & Viva	End Sem. Practical & Viva	Practical Record /Assignment/ Quiz / Presentation		L	T	P	
1	ITA-801	Web Technology	60	30	10	30	150	3	2	0	0	4
2	ITA-802	Program Elective-V	60	30	10		100	3	0	0	3
3	ITA-803	Open Core Elective - IV	60	30	10		100	3	0	0	3
4	ITA-804	Project Stage-II	-	-	-	200	200	400	-	1h	1h	8
	TOTAL		180	90	30	230	220	750	9	0	18	14

Program Elective-V

ITA-802	(A) Artificial Intelligence
	(B) Network Management

Open Core Elective-IV

ITA-803	(A) Internet of Things
	(B) Mobile Computing

ITC-501

MICROPROCESSOR & INTERFACING

ITA-501	MICROPROCESSOR & INTERFACING	2L:1T:2P	1 credits	5Hrs/Week

Objectives :-

The objective of this course is to become familiar with the architecture and the instruction set of an Intel microprocessor

- Assembly language programming will be studied as well as the design of various types of digital and analog interfaces.
- Understand the architecture of 8085 and 8051

Learning Outcomes:

At the end of this course students should:

1. Design and implement programs on 8086, ARM, PIC.
2. Design I/O circuits.
3. The program prepares students to successfully compete for employment in Electronics, Manufacturing and Embedded fields.
4. Design Memory Interfacing circuits.
5. Design and implement 8051 microcontroller based systems.
6. Describe the architecture and instruction set of ARM microcontroller

UNIT-I   (8 Hr.)

Introduction to microprocessors, Microprocessor architecture and its operations, memory, inputs-outputs (I/Os), data transfer schemes interfacing devices, architecture, advancements of microprocessors.

UNIT-II   (7 Hr.)

Architecture of 8085 microprocessor, Instruction set and Addressing modes of 8085 microprocessor, Assembly language programs of 8085 microprocessor, Stack, Subroutines, Time-Delay loops, Modular programming, Macro.

UNIT-III   (8 Hr.)

8086 Microprocessor Architecture, Register, Memory Segmentation, 8086 Memory Addressing Memory Read and Write Bus Cycle of 8086, Demultiplexing of the system Bus in 8086 and 8088 microprocessors, Instruction set and Addressing modes of 8086 microprocessor, Assembly language programs of 8086 microprocessor.

UNIT-IV   (9 Hr.)

I/O and Memory Interfacing Using 8085/8086, Interrupts of 8085/8086 Microprocessors, 8259A Programmable Interrupt Controller, Programmable peripheral Interface, 8253 Programmable Counter/Interval Timer, Communication and Bus Interfacing with 8085/8086 Microprocessor, Serial Communication Interface, DMA Controller 8257, 8279-Programmable Keyboard and Display I/O Interface, Bus Interface,8089 I/O processor.

UNIT-V   (8 Hr.)

62

8051 Microcontroller: Architecture of 8051 microcontroller, Memory organization, Timers/Counters, Interrupts, Addressing modes, 8051 Instruction set, Assembly language Programs, Applications of microcontrollers.

REFERENCES:

1. Douglas V Hall, "Microprocessors and interfacing – Programming & Hardware" TMH.

2. Gaonkar, "Microprocessor Architecture, Programming & Applications with 8085", TMH Grading System 2013 – 14.

3. Rafiquzzaman, "Microprocessors-Theory & Applications", PHI.

4. Savaliya, "8086 Programming & Advance Processor Architecture", Wiley India.

5. Ray, Bhurchandi, "Advanced Microprocessor and peripherals" TMH Pub.

6. Soumitra Kumar Mandal, "Microprocessors and Microcontroller" TMH Pub.

LIST OF EXPERIMENTS:

1. To study 8085 based microprocessor system.

2. To study 8086 based microprocessor system.

3. To develop and run a program for finding out the largest/smallest number from a given set of numbers. 4. To develop and run a program for arranging in ascending/descending order of a set of numbers.

5. To perform multiplication/division of given numbers.

6. To perform conversion of temperature from 0F to 0C and vice-versa.

7. To perform computation of square root of a given number.

8. To perform floating point mathematical operations (Addition, Subtraction, Multiplication and Division). 9. To obtain interfacing of RAM chip to 8085/8086 based system.

10. To obtain interfacing of keyboard controller.

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ITA-502
Computer Graphics

ITA-502	Computer Graphics	2L:1T:2P	4 credits	5Hrs/Week

Objectives :-

This course will introduce students to all aspects of computer graphics including hardware, software and applications. Students will gain experience using a graphics application programming interface (OpenGL) by completing several programming projects.

Learning Outcomes:

At the end of this course students should:

Have a basic understanding of the core concepts of computer graphics.
Be capable of using OpenGL to create interactive computer graphics.
Understand a typical graphics pipeline.
Have made pictures with their computer

UNIT-I   (9 Hr.)

Introduction and Overview of Graphics Systems:- Introduction to Computer Graphics, Application area of Computer Graphics, Introduction to Raster scan & Random scan displays, refreshing, flickering, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques etc.

UNIT-II   (7 Hr.)

Scan conversion techniques, Image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-spline Method.

UNIT-III   (9 Hr.)

2-D Transformation:- Translation, Rotation, Scaling, Shearing, Reflection, Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation, Windowing & Clipping:- World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping & Polygon Clipping Algorithms

UNIT-IV   (7 Hr.)

3-D Transformations:- Translation, Rotation and Scaling, Parallel & Perspective Projection:- Types of Parallel & Perspective Projection, Hidden Surface elimination:- Depth comparison, Back face detection algorithm, Painter's Algorithm, Z-Buffer Algorithm, Curve generation, Bezier and Bspline methods, Basic Illumination Model:- Diffuse reflection, Specular reflection, Phong Shading, Gouraud shading, Ray Tracing, Color models like RGB, YIQ, CMY, HSV.

UNIT-V   (8 Hr.)

Multimedia :- Characteristics of a multimedia presentation, Uses of Multimedia, Text:- Types, Unicode Standard, text Compression, Text file formats, Audio Components of an audio system, Digital Audio, Digital Audio processing, Sound cards, Audio file formats, Audio Processing software, Video: -Video color spaces, Digital Video, Digital Video processing, Video file formats, Animation:- Uses of Animation, Principles of Animation, Computer based animation 3D Animation, Animation file formats, Animation software's.

REFERENCES:-

1. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill

2. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson-Education, 2003

ITA-503
Java Programming

ITA-503	Java Programming	2L:1T:2P	4 credits	5Hrs/Week

OBJECTIVE:-

This course explores concepts underlying the definition, implementation, and use of programming languages. The goal is to provide you with an understanding of (and a vocabulary for) common language features, including how they are implemented, how other language-design choices affect them, and how they can be used effectively in program development.

OUTCOME:-

1. When given a moderate-sized Scheme program and relevant input, calculate the result of that program.
2. Describe, compare, and contrast various language features.
3. Implement an interpreter for a simple language incorporating lexical or dynamic scope, side effects and state, environments, closures, and recursion

UNIT-I   (8 Hr.)

Basic Java Features – C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods,Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance, Polymorphism, Abstract methods and Classes

UNIT-II

9 Hr.)   (

Java Collective Frame Work – Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector, Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java, Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un- modifiable Collections,

UNIT-III   (7 Hr.)

Advance Java Features – Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI,Monitors and Monitor Locks, Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT-IV   (9 Hr.)

Advance Java Technologies – Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions,

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Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT-V (7 Hr.)

Advance Web/Internet Programming (Overview): J2ME, J2EE. EJB. XML.

References:
1. E. Balaguruswamy, "Programming In Java"; TMH Publications
2. The Complete Reference; Herbert Schildt, TMH
3. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
4. Cay Horstmann, Big JAVA, Wiley India.
5. Merlin Hughes, et al; Java Network Programming, Manning Publications/Prentice H

List of Experiment:

1. Installation of J2SDK
2. Write a program to show Scope of Variables
3. Write a program to show Concept of CLASS In JAVA
4. Write a program to show Type Casting In JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public, Private, Protected) In JAVA
9. Write a program to show use and Advantages of CONTRUCTOR
10. Write a program to show Interfacing between two classes

ITA- 504(A)
Software Engineering

ITA- 504(A)	Software Engineering	3L:1T:0P	4 credits	3 Hrs/Week

OBJECTIVE:-

1. Knowledge of basic SW engineering methods and practices, and their appropriate application.
2. Describe software engineering layered technology and Process frame work.
3. A general understanding of software process models such as the waterfall and evolutionary models.

OUTCOME:-

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

UNIT –I (8 Hr.)

The Software Product and Software Process Software Product and Process Characteristics, Software Process Models: LinearSequential Model, Prototyping Model, RAD Model, Evolutionary Process Models likeIncremental Model, Spiral Model, Component Assembly Model, RUP and Agileprocesses. Software Process customization and improvement, CMM, Product andProcess Metrics.

UNIT II (7 Hr.)

Requirement Elicitation, Analysis, and Specification Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

UNIT III (7 Hr.)

Software Design The Software Design Process, Design Concepts and Principles, Software Modeling andUML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics.

UNIT IV (9 Hr.)

Software Analysis and Testing Software Static and Dynamic analysis, Code Inspection, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, TestOracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized, Testing Test Plan, Test Metrics, Testing Tools, Introduction to Object-oriented analysis, design and comparison with structured Software Engg.

UNIT V (9 Hr.)

67

Software Maintenance & Software Project Measurement Need and Types of Maintenance, Software Configuration Management [SCM], Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support, Project Management Concepts, Feasilibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance(SQA), Project Plan, Project Metrics.

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68

ITA-504(B)
Simulation & Modeling

ITA-504(B)	Simulation & Modeling	3L:1T:0P	4 credits	4Hrs/Week

Objectives: -

The aim of this course is to introduce various system modelling and simulation techniques, and highlight their applications in different areas. It includes modelling, design, simulation, planning, verification and validation. After learning the simulation techniques, the students are expected to be able to solve real world problems which cannot be solved strictly by mathematical approaches. This course begins by demonstrating the usefulness of simulation as a tool for problem solving in business, industry, government, and society.

Learning Outcomes:

• Knowledge and understanding

Understand different methods for random number generation
Have a clear understanding of the need for the development process to initiate the real problem.
Have a clear understanding of principle and techniques of simulation methods informed by research direction.

• Cognitive skills (thinking and analysis)

(a) Be able to describe the components of continuous and discrete systems and simulate them.

(b) Be able to model any system from different fields

(c) Be able to implement numerical algorithm to meet simple requirements, expressed in English.

(d) Be able to discuss the simulation methods and select the suitable technique on the problems.

UNIT-I   (9 Hr.)

Introduction to Modelling and Simulation: Nature of Simulation System, Models and Simulation. Continuous and Discrete Systems, system modelling, concept of simulation, Components of a simulation study, Principles used in modelling, Static and Dynamic physical models, Static and Dynamic Mathematical models, Introduction to Static and Dynamic System simulation, Advantages, Disadvantages and pitfalls of Simulation.

UNIT-II   (8 Hr.)

System Simulation and Continuous System Simulation: Types of System Simulation, Monte Carlo Method, Comparison of analytical and Simulation methods, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model, Continuous System models, Analog and Hybrid computers, Digital-Analog Simulators, Continuous system simulation languages, Hybrid simulation, Real Time simulations.

UNIT-III   (8 Hr.)

System Dynamics & Probability concepts in Simulation: Exponential growth and decay models, logistic curves, Generalization of growth models, System dynamics diagrams, Multi segment models, Representation of Time

Delays, Discrete and Continuous probability functions, Continuous Uniformly Distributed Random Numbers, Generation of a Random numbers, Generating Discrete distributions, Non-Uniform Continuously Distributed Random Numbers, Rejection Method.

UNIT-IV   (8 Hr.)

Simulation of Queueing Systems and Discrete System Simulation: Poisson arrival patterns, Exponential distribution, Service times, Normal Distribution Queuing Disciplines, Simulation of single and two server queue, Application of queuing theory in computer system, Discrete Events, Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization , Recording Distributions and Transit times.

UNIT-V   (7 Hr.)

Introduction to Simulation languages and Analysis of Simulation output GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements, SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements, Estimation methods, Relication of Runs, Batch Means, Regenerative techniques, Time Series Analysis, Spectral Analysis and Autoregressive Processes.

REFERENCES:

1. Gorden G., System simulation, Prentice Hall.

2. Sells, Simulation Modeling, Cengage Learning.

3. Law .,Simulation Modeling And Analysis, McGraw Hill.

4. Deo, System Simulation with Digital Computer, PHI.

5. Harrington, Simulation Modeling methods, McGraw Hill.

6. Severance, " System Modeling & Simulation, Willey Pub.

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70

ITA- 505(A)
E-Commerce & Governance

ITA 505(A)	E-COMMERCE & GOVERNANCE	3L:1T:0P	4 credits	4Hrs/Week

Objectives: -

The main objective of this course are to :-

Examine the different definitions of e-commerce and e-governance
Describe major players in e-commerce
Explain the key drivers of e-commerce
Attempt a classification of e-commerce
Mention the role played by governments in the development of e-commerce
Examine the prerequisites for e-governance
Identify the skills needed for the successful functioning of e-governance
Describe the different models of e-governance

Learning Outcomes:

On completing this module, you should know clearly the meaning of the terms E-commerce and E-governance. You should also be aware of the various e- governance initiatives in India. You also need to have an idea of the role libraries, especially public libraries, can play in such initiatives.

UNIT-I (8 Hr.)

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal, environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

UNIT-II (8 Hr.)

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

UNIT-III (8 Hr.)

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of egovernance, e-governance models broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT-IV (8 Hr.)

E-readiness, e-government readiness, E- Framework step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in egovernance, e-seva.

UNIT-V (8 Hr.)

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

REFERENCES:

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-governance: concept and case study", PHI Learning Private Limited.
3. V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4. David Whiteley, "E-commerce study, technology and applications", TMH.

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ITA-505(B)
Information Theory & Coding

ITA-505(B)	Information Theory & Coding	3L:0T:0P	3 credits	3Hrs/Week

Objective:

The objectives of this course are to understand the fundamentals of Cryptography, to acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity, to understand the various key distribution and management schemes, to understand how to deploy encryption techniques to secure data in transit across data networks, to design security applications in the field of information technology.

Outcome:

The students at the end of the course will be able to:

- Understand and explain the basic concepts of Information theory, source coding, channel and channel capacity, channel coding and relation among them.

- Describe the real life applications based on the fundamental theory.

- Calculate entropy, channel capacity, bit error rate, code rate, steady-state probability and so on.

- Implement the encoder and decoder of one block code or convolutional code using any program language

UNIT-I (9 Hr.)

Uncertainty, Information and Entropy Information Measures, Characteristics on information measure, Shannon's concept of information, Shannon's measure of information, Model for source coding theorem, Communication system, Source coding and line/channel coding, channel mutual information capacity (Bandwidth).

UNIT-II (8Hr.)

Channel coding, Theorem for discrete memory less channel, Information capacity theorem Error detecting and error correcting codes, Types of codes, Block codes, Tree codes, Hamming Codes, Description of linear block codes by matrices, Description of linear tree code by matrices, Parity check codes, Parity check polynomials.

UNIT-III (9 Hr.)

Compression: Lossless and lossy, Huffman codes, Binary image compression schemes, Run length Encoding, CCITT group-3 1D compression, CCITT group-3 2D compression, CCITT group-4 2D compression.

UNIT-IV (7 Hr.)

Video Image Compression: Requirement of full motion video compression, CCITT H 261 video coding algorithm, MPEG compression methodology, MPEG-2 compression, Audio (Speech)compression.

UNIT-V (7Hr.)

Cryptography: Encryption, Decryption, Cryptogram (cipher text), Concept of cipher, Cryptanalysis, Keys: Single key (Secret key), Cryptography, two-key (Public key) cryptography, Single key cryptography, Ciphers, Block Cipher code, Stream ciphers, Requirements for secrecy, The data Encryption Standard, Public Key Cryptography, Diffie- Hellmann public key distribution, The Rivest- Shamin Adelman(R-S-A) system for public key cryptography, Digital Signature.

REFERENCES:

1. Rajan Bose "Information Theory, Coding and Cryptography", TMH, 2002.
2. G A Jones J M Jones, "Information and Coding Theory", Springer Verlag, 2004.
3. Cole, "Network Security", Bible, Wiley INDIA. Second Addition.
4. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 200

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Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

ITA-601
Compiler Design

ITA-601	**Compiler Design**	2L:1T:2P	4 credits	5 Hrs/Week

Objective:

The main objective of this course is to introduce the major concept areas of language translation and compiler design and to develop an awareness of the function and complexity of modern compilers. This course is a study of the theory and practice required for the design and implementation of interpreters and compilers for programming languages.

Outcome

By the end of the course, the successful student will be able to do:

* To realize basics of compiler design and apply for real time applications.
* To introduce different translation languages – To understand the importance of code optimization.
* To know about compiler generation tools and techniques.
* To learn working of compiler and non-compiler applications.
* Design a compiler for a simple programming language

UNIT-I   (9 Hr.)

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), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.

UNIT-II   (10 Hr.)

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT-III   (8 Hr.)

Bottom-Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples, Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

UNIT-IV   (8 Hr.)

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors. Semantic errors.

UNIT-V   (5 Hr.)

Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

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73

REFERENCES:

1. Principles of compiler design -A.V. Aho , J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel. Cambridge University Press.
3. A. C. Holub. Compiler Design in C , Prentice-Hall Inc, 1993.
4. Raghuvan, Compiler Design. TMH Pub.

List of Experiments:

1. Develop a lexical analyzer to recognize a few patterns.
2. Write a program to parse using Brute force technique of Topdown parsing.
3. Develop LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser
6. Write a program for generating for various intermediate code forms i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. Generate YACC specification for a few syntactic categories.
10. Given any intermediate code form implement code optimization techniques

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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES
Outcome based Curriculum for
Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

ITA-602
Computer Network

ITA-602	Computer Network	2L:1T:2P	4 credits	5 Hrs/Week

Objective:

This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

Outcomes:

The students will be able to:

* Build an understanding of the fundamental concepts of computer networking.
* Familiarize the student with the basic taxonomy and terminology of the computer networking area.
* Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
* Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

UNIT-I (9 Hr.)

Introduction to computer networks and Internet, overview Advantages - network, Types-server based, peer, hybrid, Server types, Network Topology: Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols Hardware Protocols, Software Protocols, Selecting and design the network for an organization.

UNIT-II (8 Hr.)

Signal Transmission: Digital signaling, Analog Signaling, Bit synchronization, Baseband and Broadband transmission, Network Media types- properties & specialties, Network adapters– working principals, configuration and selection.

UNIT-III (8Hr.)

Network Layer: Network Layer Design issues, Store and Forward Packet Switching, connection less and connection oriented networks, routing algorithm's, optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT-IV (8 Hr.)

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP. Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Crash Recovery.

UNIT-V (7 Hr.)

UDP, RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP, Application Layer: Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH.

REFERENCES:

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75

1. Andrew & Tanenbaum. "Computer Network ".
2. Prakash C Gupta, "Data Communication.
3. William Stallings, "Data and Computer Communication".
4. Computer Networking and the Internet (5th edition),Fred Halsall, Addison Wesley.
5. TCP/IP Protocol Suite (3rd edition), Behrouz Forouzan, McGraw Hill.

LIST OF EXPERIMENTS:
1. Establishment and configuration of LAN.
2. Study of WAN.
3. Case study of ARP AND RARP Protocols.
4. Study of basic networking commands like ping, ipconfig, etc.
5. Case study of various Routing Strategies.
6. Case studies of various Network Topologies.
7. Study of sliding window protocol.
8. Configuring routers, bridges and switches and gateways.
9. Case study of client-server application.
10. Study of IPv4, IPv6 Protocol.

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76

Program Elective-II
ITA-603(A)
Distributed System

ITA-603(A)	Distributed System	3L:0T:0P	3 credits	3Hrs/Week

OBJECTIVE:

1. To learn the principles, architectures, algorithms and programming models used in distributed systems.
2. To examine state-of-the-art distributed systems, such as Google File System.
3. To design and implement sample distributed systems.

OUTCOME:

1. Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
2. Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

UNIT-I   (7 Hr.)

Introduction to distributed systems Architecture: for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System.

UNIT-II   [9 Hr.]

Distributed Share Memory And Distributed File System :Basic Concept of Distributed Share Memory [DSM], DSM Architecture & its Types, Design & Implementations issues in DSM System, Structure of Share Memory Space, Consistency Model and Thrashing, Desirable features of good Distributed File System, File Model ,File Service Architecture ,File Accessing Model ,File Sharing Semantics, File Catching Scheme ,File Application & Fault tolerance, Naming: Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

UNIT-III   (8 Hr.)

Inter Process Communication And Synchronization API for Internet Protocol :Data Representation & Marshaling, Group Communication, Client Server Communication, RPC-Implementing RPC Mechanism, Stub Generation, RPC Messages ,Synchronization :Clock Synchronization, Mutual Exclusion, Election Algorithms: Bully & Ring Algorithms

UNIT-IV   [8 Hr.]

Distributed Scheduling And Dead lock Distributed Scheduling: Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its Issues, Deadlock-Issues indead lock detection & Resolutions ,Deadlock Handling Strategy, Distributed Deadlock Algorithms.

UNIT-V   **(8 Hr.)**

Distributed Multimedia &Database system: Distributed Data Base Management System[DDBMS], Types of Distributed Database, Distributed Multimedia: Characteristics of multimedia Data, Quality of Service Managements.

REFERENCES:

1. Sinha, Distributed Operating System Concept & Design, PHI.
2. Coulouris & Dollimore, Distributed SystemConcepts and Design, Pearson Pub
3. Singhal & Shivratari, Advance Concept in Operating System, McGraw Hill.
4. Attiya &Welch, Distributed Computing, Wiley Pub

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Department of Information Technology

ITA-603(B)

Digital Image Processing

ITA-603(B)	DIGITAL IMAGE PROCESSING	3L:0T:2P	4Credits	5Hrs/Week

OBJECTIVE:-

- Describe and explain basic principles of digital image processing;
- Design and implement algorithms that perform basic image processing (e.g., noise removal and image enhancement);
- Design and implement algorithms for advanced image analysis (e.g., image compression, image segmentation & image representation);
- Assess the performance of image processing algorithms and systems.

OUTCOME:-

- Design and Implementation of different transforms like: Fourier Transform, Z Transform, Discrete Cosine Transform, Walsh Transform, Hadamard Transform,
- Design and Implementation of Digital Filters like: FIR, IIR.
- Design and Implementation of multi-rate and adaptive systems.
- Power spectrum estimation and analysis

UNIT-I   (8 Hr.)

Digital Image Processing: Elements of a Digital Image Processing system, Structure of the Human eye, Image formation and contrast sensitivity, Sampling and Quantization, Neighbors of a pixel, Distance measures, Photographic file Structure and exposure, File characteristics, Linear scanner, Video camera, Image processing applications.

UNIT-II   (7 Hr.)

image Transform: Introduction to Fourier transform DFT, Properties of two dimensional FT, Separability, Translation, Periodicity, Rotation, Average value, FFT algorithm, Walsh transform, Hadamard transform, Discrete Cosine transform.

UNIT-III   (8 Hr.)

Image Enhancement: Definition, Spacial domain methods, Frequencydomain methods, Histogram modify technique, Neighborhood averaging, Media filtering, Lowpass filtering, Averaging of multiple images, Image sharpening by differentiation and high pass filtering.

UNIT-IV   (9 Hr.)

Image Restoration: Definition, Degradationmodel, Discrete formulation, Circulant matrices, Block circulant matrices, Effect of diagnolization of circulant and block circulant matrices, Unconstrained and constrained restoration, Inverse Filtering, Wiener filter, Restoration in spatial domain.

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79

UNIT-V (8 Hrs.)

Image Encoding: Objective and subjective fidelity criteria, Basic encoding process, The mapping, The quantizer, The coder, Differential encoding, Contour encoding, Run length encoding, Image encoding relative to fidelity criterion, Differential pulse code modulation.

REFERENCES:

1. Rafael. C. Gonzalez., and Paul. Wintz. "Digital Image Processing", Addison-Wesley Publishing Company.
2. Jain Anil K., "Fundamentals of Digital Image Processing", Prentice Hall.
3. Sonnfield, and Kak. A.C., "Digital Image Processing", Academic Press
4. William K. Pratt., "Digital Image Processing", John Wiley and Sons.

LIST OF EXPERIMENT:-

1. To study the Image Processing concept.
2. To obtain histogram equalization image.
3. To implement smoothing or averaging filter in spatial domain.
4. Program for opening and closing of the image.
5. To fill the region of interest for the image.
6. Program for edge detection algorithm.
7. Program of sharpen image using gradient mask.
8. Program for morphological operation: erosion and dilation
9. Program for DCT/IDCT computation.

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Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

ITA-604(A)
Data Mining and Data Warehousing

ITA-604(A)	Data Mining and Data Warehousing	3L:0T:0P	3 Credits	3Hrs/Week

Objective:

The objective of this course is to familiar with mathematical foundations of data mining tools, Understand and Implement classical models and algorithms in data warehouses and data mining. Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Outcome:

Students will be able to:

1. Understand Data Warehouse fundamentals, Data Mining Principles
2. Design data warehouses with dimensional modeling and apply OLAP operations.
3. Identify appropriate data mining algorithms to solve real world problems
4. Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
5. Describe complex data types with respect to spatial and web mining

UNIT- I   (9 Hr.)

Data Mining: Basic concept ,technology and rules, application of data mining, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas.

UNIT-II   (9 Hr.)

Rules & Clustering Techniques: Introduction, Various association algorithms like A Priori, Partition, Pincer search etc., Generalized association rules, Clustering paradigms; Partitioning algorithms like K- Method, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; categorical clustering algorithms, STIRR, ROCK, CACTUS.

UNIT-III   (7 Hr.)

Data mining techniques: Exploration of data mining methodologies, decision tables, decision trees, classification rules, association rules, clustering, statistical models &linear models.

Web mining: Introduction to web mining techniques, web basics and HTTP, data sources on the web, personalization, working with logs, forms and cookies, user identification and path analysis, E-Metrics.

UNIT-IV   (8 Hr.)

Data Mining of Image and Video : A case study, Image and Video representation techniques, feature extraction, motion analysis, content based image and video retrieval, clustering and association paradigm, knowledge discovery.

UNIT-V   (7 Hr.)

Data warehousing : Data warehouse, OLAP and Data mining, OLTP vs OLAP, Data Warehouse Design Identifying facts & dimensions, designing fact tables, dimension tables, star flake schema query redirection, OLAP operations Data ware house High Performance Computing architecture, Multidimensional schemes:1 partitioning strategy, aggregation, data marting, metadata. Capacity planning, tuning the data warehouse testing the data warehouse; developing test plan, testing operational environment Distributed and virtual data warehouses.

Reference Books :

1. Data Mining Techniques ; Arun K.Pujari ; University Press.
2. Data Mining, Adriaans & Zantinge; Pearson education.
3. Mastering Data Mining; Berry Linoff; Wiley.
4. Data Mining; Dunham; Pearson education.

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Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

IT A-6014(B)	Soft Computing	3L:0T:0P	4 credits	5Hrs/Week

IT A-6014(B)
Soft Computing

Objective:

The objective of this course is to develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory. Introduce students to artificial neural networks and fuzzy theory from an engineering perspective.

Scope:

The students are expected to:

* Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.
* Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
* To understand the fundamental theory and concepts of neural networks, identify different neural network architectures, algorithms, applications and their limitations
* Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications
* Reveal different applications of these models to solve engineering and other problems

UNIT-I   (9 Hr.)

Soft Computing:- Introduction of soft computing, soft computing vs hard computing, various types of soft computing techniques, applications of soft computing. Introduction to Neural Network:- Concept, biological neural network, evolution of artificial neural network, McCulloch-Pitts neuron models, Learning (Supervise & Unsupervised) and activation function, Models of ANN-Feed forward network and feedback network, Learning Rules Hebbian, Delta, Perceptron Learning and Window-Hoff, winner take all.

UNIT – II   (9 Hr.)

Supervised Learning: Perceptron learning, - Single layer/multilayer, linear Separability, Adaline, Madaline, Back propagation network, RBFN. Application of Neural network in forecasting, data compression and image compression.

UNIT – III   (7 Hr.)

Unsupervised learning: Kohonen SOM (Theory, Architecture, Flow Chart, Training Algorithm) Counter Propagation (Theory, Full Counter Propagation NET and Forward only counter propagation net), ART (Theory, ART1, ART2), Application of Neural networks in pattern and face recognition, Intrusion detection, robotic vision.

UNIT – IV   (7 Hr.)

Fuzzy Set: Basic Definition and Terminology, Set-theoretic Operations, Member Function, Formulation and Parameterization, Fuzzy rules and fuzzy Reasoning, Extension Principal and Fuzzy Relations, Fuzzy if-then Rules.

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Fuzzy Inference Systems. Hybrid system including neuro fuzzy hybrid, neuro generic hybrid and fuzzy genetic hybrid, fuzzy logic controlled GA. Application of Fuzzy logic in solving engineering problems.

UNIT – V   (7 Hr.)

Genetic Algorithm: Introduction to GA, Simple Genetic Algorithm, terminology and operators of GA (individual, gene, fitness, population, data structure, encoding, selection, crossover, mutation, convergence criteria). Reasons for working of GA and Schema theorem. GA optimization problems including JSPP (Job shop scheduling problem), TSP (Travelling salesman problem), Network design routing, timetabling problem. GA implementation using MATLAB.

REFERENCES:

1. S.N. Shivnandam. "Principle of soft computing", Wiley
2. Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
3. Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli., PHI Pub.
4. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.

LIST OF EXPERIMENTS

1. Form a Perceptron Net for basic gates with binary input and output.
2. Using ADALINE Net, generate XOR function with bipolar inputs and targets.
3. To Study the ADALINE NET and their training algorithm
4. To study the MADALINE NET and their training algorithm
5. Learn pattern, target output, learning rate and activation function
6. To implement AND function using Mc-Culloch Pitts neuron model
7. Design fuzzy inference system for a given problem
8. Implement Travelling salesman problem using Genetic algorithm
9. To study the training algorithm of ART

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83

ITA-605(A)
PHP Technology

ITA-605(A)	PHP TECHNOLOGY	2L:1T:2P	4 credits	5Hrs/Week

Objectives: –

The main objective of this course is to introduce the major concept areas of language translation and compiler design and to develop an awareness of the function and complexity of modern compilers. This course is a study of the theory and practice required for the design and implementation of interpreters and compilers for programming languages.

Learning Outcomes:

At the end of the course, students will have basic understanding of the web technology and be able to architect, write, debug, and run complete web applications using PHP and MySQL.

UNIT-I (8 Hr.)

Introduction to PHP: Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression. Handling HTML Form With PHP: Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form , Redirecting a form after submission.

UNIT-II (8 Hr.)

Decisions and loop: Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html. Function: What is a function, Define a function, Call by value and Call by reference, Recursive function.

UNIT-III (8 Hr.)

String: Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function. Array: Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and for each(), Some useful Library function.

UNIT-IV (8 Hr.)

Working with file and Directories: Understanding file& directory, Opening and closing a file, Coping, renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading. State management: Using query string(URL rewriting), Using Hidden field, Using cookies, Using session.

UNIT-V (8 Hr.)

String matching with regular expression: What is regular expression, Pattern matching in Php, Replacing text, Splitting a string with a Regular Expression. Generating Images with PHP: Basics of computer Graphics, Creating Image, Manipulating Image, Using text in Image.

REFERENCES:

1. Learning PHP, MySQL, books by , O''riley Press.

2. PHP & MySQL: Novice to Ninja by Kevin Yank.

3. PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman.

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ITA-605(B)

Cyber Law & Ethics

ITA-605(B)	Cyber Law & Ethics	3L:0T:0P	3 credits	3 Hrs/Week

Objective:
The Objectives Of This Course Is To Enable Learner To Understand, Explore, And Acquire A Critical Understanding Cyber Law. Develop Competencies For Dealing With Frauds And Deceptions (Confidence Tricks, Scams) And Other Cyber Crimes For Example, Child Pornography Etc. That Are Taking Place Via The Internet.

Outcomes:
Student will be able to:
1. Make Learner Conversant With The Social And Intellectual Property Issues Emerging From 'Cyberspace.
2. Explore The Legal And Policy Developments In Various Countries To Regulate Cyberspace;
3. Develop The Understanding Of Relationship Between Commerce And Cyberspace; And
4. Give Learners In Depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection.
5. Make Study On Various Case Studies On Real Time Crimes.

UNIT-I
(9 Hr.)

Cyber world: an overview, internet and online resources, security of information, digital signature, intellectual property (IP), historical background of IP, IPR governance, National patent offices, the world intellectual property organization (WIPO).

UNIT-II
(9 Hr.)

Introduction about the cyber space, cyber law, regulation of cyber space, scope of cyber laws: ecommerce; online contracts; IPRs (copyright, trademarks and software patenting), e-taxation; e-governance and cyber-crimes, cyber law in India with special reference to Information Technology Act, 2000.

UNIT-III
(8 Hr.)

Introduction to computer and cyber-crimes, Cyber-crimes and related concepts, distinction between cyber-crimes and conventional crimes, Cyber criminals and their objectives. Kinds of cyber-crimes cyber stalking; cyber pornography, forgery and fraud, crime related to IPRs, cyber terrorism; computer vandalism etc. Cyber forensics, computer forensics and the law, forensic evidence, computer forensic tools.

UNIT-IV
(7 Hr.)

Regulation of cyber-crimes, Issues relating to investigation, issues relating to jurisdiction, issues relating to evidence, relevant provisions under Information Technology Act 2000, Indian penal code, pornography Act and evidence Act etc.

UNIT-V
(7 Hr.)

Copyright issues in cyberspace: linking, framing, protection of content on web site, international treaties, trademark issues in cyberspace: domain name dispute, cyber-squatting, uniform dispute resolution policy, computer software and related IPR issues.

REFERENCES:
1. Nelson, Phillips, "Computer Forensics and Investigations", Cengage Learning India.
2. Vinod V. Sople, "Managing Intellectual Property" PHI Learning Private Limited.
3. Dr.R.K.Tiwari P.K.Sastri,K.V. Ravikumar, "Computer crime and Computer Forensics", First Edition 2002, Select publishers.
4. NIIT, Understanding Forensics in IT, PHI Learni

ITA-701
Ad-Hoc And Sensor Network

ITA-701	Ad-HOC AND SENSOR NETWORK	3L:0T:2P	4 credits	5 Hrs/Week

OBJECTIVE :-

To understand the state-of-the-art in network protocols, architectures and applications, Analyze existing network protocols and networks, Develop new protocols in networking, To understand how networking research is done, To investigate novel ideas in the area of Networking via term-long research projects.

OUTCOME:-

After completion of the course the student will be able to

* Describe the unique issues in ad-hoc/sensor networks.
* Describe current technology trends for the implementation anddeployment of wirelesad-hoc/sensor networks.
* Discuss the challenges in designing MAC, routing and transportprotocols for wireless ad-hoc/sensor networks.
* Discuss the challenges in designing routing and transport protocolsfor wireless Ad-hoc/sensor networks.

UNIT-I   (8 Hr.)

Introduction :Introduction-Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, GSM, GPRS, PCS, WLAN and UMTS, Components of Packet Radios, Routing in PRNETs, Ad Hoc Wireless Networks, Wireless Sensor Networks, Traffic Profiles, Types of Ad Hoc Mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad Hoc Mobile Networks.

UNIT II   (9 Hr.)

Ad Hoc wireless MAC protocols-Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Ad Hoc Routing Protocols-Introduction, Classifications of Routing Protocols, Table-Driven Routing Protocols –Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Source-Initiated On-Demand Approaches -Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR) LocationAided Routing (LAR).

UNIT III   (8 Hr.)

Multicast routing in Ad Hoc Networks : Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh-Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols -Energy-Efficient Multicasting.

UNIT IV   (7 Hr.)

Transport Layer, Security Protocols : Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management.

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UNIT V   (8 Hrs.)

QoS and Energy Management : Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classifications of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, Energy Management in Ad Hoc Wireless Networks –Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes.

REFERENCES BOOKS:-

1. C. Siva Ram Murthy and B.S. Manoj "Ad Hoc Wireless Networks: Architectures and Protocols", Pearson Education.

2. C.K. Toh, "Ad Hoc Mobile Wireless Networks: Protocols and Systems", Pearson Education.

3. George Aggelou, "Mobile Wireless Networks", Tata McGraw-Hill.

LIST OF EXPERIMENT:-

1. Introduction of Wireless sensor network applications and its simulation.
2. Network Simulator installation of wireless sensor network.
3. Write TCL script for transmission between mobile nodes.
4. Write TCL script for sensor nodes with different parameters.
5. Generate tcl script for udp and CBR traffic in WSN nodes.
6. Generate tcl script for TCP and CBR traffic in WSN nodes.
7. Implementation of routing protocol in NS2 for AODV protocol.
8. Implementation of routing protocol in NS2 for DSR protocol.
9. Implementation of routing protocol in NS2 for TORA protocol.
10. Study other wireless sensor network simulators (Mannasim, Contiki.)

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87

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ITA- 702

CLOUD COMPUTING

ITA-702	CLOUD COMPUTING	3L:0T:2P	4 credits	5 Hrs/Week

Objectives

The objective of this course is to provide graduate students of Information Technology with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations. Another objective is to expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Outcomes

1. Analyze the Cloud computing setup with it's vulnerabilities and applications using different architectures.

2. Design different workflows according to requirements and apply map reduce programming model, algorithm.

3. Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds

4. Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application

5. addressing the security issues of cloud computing.

UNIT-I   (8 Hr.)

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II   (8 Hr.)

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (Iaas, Paas & Saas).

UNIT-III   (9 Hr.)

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

UNIT-IV   (7 Hr.)

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I , Network security – II, Host security, Disaster recovery and management, Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V   18 Hrs.

Cloud Solutions - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds. Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services, Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010

2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009

3 Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridg Press, 2010

ITA-703(A)

OBJECT ORIENTED ANALYSIS AND DESIGN

ITA-703(A)	OBJECT ORIENTED ANALYSIS AND DESIGN	3L:0T:0P	3 credits	3 Hrs/Week

UNIT- I Introduction to OOAD   (10 Hr.)

Introduction to OOAD – Unified Process – UML diagrams – Use Case – Class Diagrams– Interaction Diagrams – State Diagrams – Activity Diagrams – Package, component and Deployment Diagrams.

UNIT II DESIGN PATTERNS   (7 Hr.)

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller – Design Patterns - creational – factory method – structural – Bridge – Adapter – behavioural – Strategy – observer.

UNIT III CASE STUDY   (7 Hr.)

Case study – the Next Gen POS system, Inception -Use case Modeling – Relating Use cases – include, extend and generalization – Elaboration – Domain Models – Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies – Aggregation and Composition.

UNIT IV APPLYING DESIGN PATTERNS   (8 Hr.)

System sequence diagrams – Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement – UML class diagrams – UML interaction diagrams – Applying GoF design patterns.

UNIT V CODING AND TESTING   (8 Hr.)

Mapping design to code – Testing: Issues in OO Testing – Class Testing – OO Integration Testing – GUI Testing – OO System Testing.

TEXT BOOK

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and

Design and Iterative Development", Third Edition, Pearson Education, 2005.

REFERENCES:

1. Simon Bennett, Steve Mc Robb and Ray Farmer, "Object Oriented Systems Analysis and Design

Using UML", Fourth Edition, Mc-Graw Hill Education, 2010.

2. Erich Gamma, and Richard Helm, Ralph Johnson, John Vlissides, "Design patterns: Elements of

Reusable Object-Oriented Software", Addison-Wesley, 1995.

3. Martin Fowler, "UML Distilled: A Brief Guide to the Standard Object Modeling Language"

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90

CSA-703(B)

Neural Network

CSA-703(B)	Neural Network	3L:0T:0P	3 credits	3Hrs/Week

Objective:
Introduce major deep learning algorithms, the problem settings, and their applications to solve real world problems.

Outcomes:

Student should be able to:

* Describe the structure and function of the most common artificial neural network (ANN) types, e.g. multi-layer perceptron, recurrent network, self-organizing maps, Boltzmann machine, deep belief network, autoencoder, and provide examples of their applications
* Explain mechanisms of supervised/unsupervised learning from data and information processing in different ANN architectures, and also account for derivations of the basic ANN algorithms discussed in the course
* Demonstrate when and how deep architectures lead to increased performance in pattern recognition and data mining problems
* Quantitatively analyze the process and outcomes of learning in ANNs, and account for their shortcomings, limitations
* Apply, validate and evaluate suggested types of ANNs in typical small problems in the realm of regression, prediction, pattern recognition, scheduling and optimization
* Devise and implement ANN approaches to selected problems in pattern recognition, system identification or predictive analytics using commonly available development tools, and critically examine their applicability

Unit-I   (9 Hr.)

Neural Network (NN): Introduction, benefits of neural network, models of a neuron, neural network as directed graph, network architectures, artificial intelligence, and neural network.
Learning processes: error correction learning, memory based learning, Hebbian learning, competitive learning, Boltzman learning, learning tasks, adaptation, statistical nature of learning process, statistical learning theory.

Unit-II   (8 Hr.)

Perceptron:
Single layer perceptron: adaptive filtering problem, unconstrained optimization technique, linear least squares filter. least mean square algorithm (LMS), perceptron convergence theorem.
Multilayer perceptron: architecture, back propagation algorithm, generalization, approximations of functions, network pruning techniques

Unit-III   (8 Hr.)
Radial Basis Function (RBF) Networks: Cover's theorem on the separability of patterns, interpolation problem, supervised learning as an Ill-posed hypersurface reconstruction problem, regularization theory, regularization network, generalized radial basis function networks (RBF), estimation of the regularization parameter, approximation properties of RBF networks, comparison of RBF networks and multilayer perceptrons, Kernel regression and its relation to RBF networks, learning strategies.

Unit-IV   (8 Hr.)
Information-Theoretic Models: Entropy, maximum entropy principle, mutual information, Kullback-Leibler divergence, mutual information as an objective function to be optimized, maximum mutual information principle, infomax and redundancy reduction, spatially coherent and incoherent features, independent component analysis, maximum likelihood estimation, maximum entropy method.

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Unit V (8 Hr.)

Dynamically Driven Recurrent Networks: Introduction, recurrent network architectures, state space model, non-linear autoregressive with exogenous input model, computational power of recurrent networks, learning algorithms, back propagation through time, real time recurrent learning, Kalman filter, decoupled Kalman filter, vanishing gradients in recurrent networks, system identification, model reference adaptive control.

References:

1. S. Haykin: Neural Networks- A Comprehensive Foundation, PHI Learning.
2. S. N. Sivanandam, S. Sumathi and S. N. Deepa: Introduction to Neural Networks using Matlab 6.0, TMH, New Delhi.
3. J. A Freeman and D. M. Skapura: Fundamentals of Neural Networks- algorithms, applications and programming techniques, Pearson Education.
4. M. T. Hagan, H. B. Demuth and M. Beale: Neural Network Design, Cengage Learning.
5. J.A Anderson: An Introduction to Neural Networks, PHI Learning.
6. Satish Kumar: Neural Networks, TMH, New Delhi.

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92

ITA-704(A)

Information And Storage Management

ITA-704(A)	INFORMATION AND STORAGE MANAGEMENT	3L:0T:0P	3 credits	3Hrs/Week

OBJECTIVE:-

ISM is very useful for efficient and effective planning and control functions of the management. Management is the art of getting things done through others. MIS will be instrumental in getting the things done by providing quick and timely information to the management. Reports give an idea about the performance of men, materials, machinery, money and management. Reports throw light on the utilization of resources employed in the organization.

OUTCOME:-

- Search, retrieve and synthesize information from a variety of systems and sources.
- Evaluate systems and technologies in terms of quality, functionality, cost-effectiveness and adherence to professional standards.
- Integrate emerging technologies into professional practice.
- Apply theory and principles to diverse information contexts

UNIT-I   (8 Hr.)

Introduction:-Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components,Data creation and The value of data to a business,Information Lifecycle Management, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Center infrastructure,Data categorization.

UNIT-II   (8 Hr.)

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

UNIT-III   (9 Hr.)

Introduction To Networked Storage:-Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS,IP-SAN, Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

Introduction to Information Availability: -Business Continuity and Disaster Recovery Basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles & techniques.

UNIT-IV   (8 Hr.)

Managing & Monitoring:-Management philosophies (holistic vs. system & component), Industry management standards (SNMP, SMI-S, CIM), Standard framework applications, Key management, Metric analysis methodologies & trend analysis, Reactive and pro-active management best practices, Provisioning & configuration change planning, Problem reporting, prioritization, and handling techniques, Management tools overview.

UNIT-V   (7 Hr.)

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Securing Storage and Storage Virtualization:-Information security, Critical security attributes for information systems, Storage security domains, List and analyze the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

REFERENCE BOOKS:

1. EMC Corporation, Information Storage and Management, Wiley, India.

2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill , Osborne, 2003.

3. Marc Farley, "Building Storage Networks", Tata McGraw Hill ,Osborne, 2001.

4. Additional resource material on www.emc.com/resource-library/resource-library.esp

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94

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ITA-704(B)

Optimization Techniques

ITA-704(B)	OPTIMIZATION TECHNIQUES	3L:0T:0P	3 credits	3 Hrs/Week

OBJECTIVE:-

The student should be made to;
* Be exposed to compiler writing tools.
* Learn to implement the different Phases of compiler
* Be familiar with control flow and data flow analysis
* Learn simple optimization techniques

OUTCOME:-

* Implement the different Phases of compiler using tools
* Analyze the control flow and data flow of a typical program
* Optimize a given program
* Generate an assembly language program equivalent to a source language program

UNIT-I
(8 Hr.)

INTRODUCTION Non-linear programming. Mathematical fundamentals. Numerical evaluation of gradient Unconstrained Optimization: One dimensional, single variable optimization. Maximum of a function. Uni modal-Fibonacci method. Polynomial based methods.

UNIT-II
(7 Hr.)

UNCONSTRAINED MINIMIZATION Multivariable functions. Necessary and sufficient conditions for optimality. Convexity. Steepest Descent Method -Convergence Characteristics. Conjugate Gradient Method. Linear programming - Simplex Method.

UNIT-III
(8 Hr.)

CONSTRAINED MINIMIZATION Non-linear programming. Gradient based methods. Rosen's gradient, Zoutendijk's method, Generalizedreduced gradient, Sequential quadratic programming. Sufficient condition for optimality.

UNIT-IV
(9 Hr.)

DIRECT SEARCH METHODSDirect search methods for nonlinear optimization. Cyclic coordinate search. Hooke and Jeeves Pattern search method. Genetic algorithm. Discrete And Dynamic Programming: Integer and discrete programming. Branch and bound algorithm for mixed integers. General definition of dynamic programming problem. Problem modeling and computer implementation. Shortest path problem.

UNIT –V
(8 Hr.)

OPTIMIZATION APPLICATION:Transportation problem. Transportation simplex method. Network problem. Maximum flow in networks. General definition of dynamic programming. Problem modeling and computer

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implementation. Finite Element Based Optimization: Parameter optimization using gradient methods -Derivative calculation. Shape optimization. Topology optimization of continuum structures

After Class Students should learn

1. Implementation of Symbol Table

2. Develop a lexical analyzer to recognize a few patterns in C. (Ex. identifiers, constants, comments, operators etc.)

3. Implementation of Lexical Analyzer using Lex Tool

4. Convert the BNF rules into Yacc form and write code to generate Abstract Syntax Tree.

5. Implement control flow analysis and Data flow Analysis

7. Implement any one storage allocation strategies (Heap, Stack, Static)

8. Implementation of Simple Code Optimization Techniques (Common Folding., etc.)

TEXT BOOK

1. George Leimman, Optimization Techniques, Volume 51st Edition, ISBN: 9780030955131, Academic Press

REFERENCES BOOK

1. Foulds, L. R., Optimization Techniques an Introduction, springer

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96

ITA-705
Project Stage-I

ITA-705	PROJECT STAGE-II	0L:0T:10P	5 credits	10 Hrs/Week

Students must observe following points to enrich their learning in electrical engineering during industrial training:

* The training must be the advance/ different already done on minor training
* Industrial environment and work culture
* Organizational structure and inter personal communication
* Machines/ equipment/ instruments -their working and specifications.
* Product development procedures and plans.
* Project planning, monitoring and control.
* Quality control and assurance.-Maintenance system.
* Costing system.-Stores and purchase systems.-Roles and responsibilities of different categories of personnel.
* Customer services.
* Problems related to various areas of Work etc.
* Layout if any

To be submitted :The students has to submit the power point presentation of minimum15 slides of the training performed (comprising of points stated above) along with the original certificate of training performed with proper seal and signature of the authorised person.

ITA-706
Self Study/GD/Seminar

ITA-706	SELF STUDY/GD/SEMINAR II	0L:0T:2P	1 credits	2Hrs/Week

Objective

To improve the mass communication and convincing / understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves. Evaluation will be done by assigned faculty based on group discussion and power point presentation.

A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One should learn to control the conversation through listening attentively and then having the perseverance to mold it towards his/her own direction.

Outcomes:

- Analytical thinking
- Lateral thinking
- constructive argument
- Communication skill
- Presentation of views

Students will discuss the course related and interdisciplinary topics for problem solving. They will improve the mass communication and convincing / understanding skills about subject and their related problem in a group of students.

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ITA-801 Web Technology

ITA-801	WEB Technology	3L:0T:2P	4 credits	5Hrs/Week

OBJECTIVE :-

The goals of the course are as follows: To be able to analyze and design comprehensive systems for the creation, dissemination, storage, retrieval, and use of electronic records and documents

OUTCOME:-

Students should be able to:

• Employ techniques to analyze and evaluate software architectures on a real-world large-scale web-based software systems.

• Create and document a reference architecture for a non-trivial Webbased technological product.

• Present findings of case study analysis of software architectures of a family of large-scale web-based software systems.

• Envision an innovative product for a wicked problem and develop an architecture for the product that utilizes service-oriented computing technologies

• Write a research-in-progress paper on a Web engineering topic that utilizes Design Science Research methodology and adheres to appropriate academic standards.

UNIT-I   (8 Hr.)

Web Engineering: Introduction, History, Evolution and Need, Time line, Motivation, Categories & Characteristics of Web Applications, Web Engineering Models, Software Engineering v/s Web Engineering. World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Browser and search engines: Introduction, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines, Web Servers: Introduction, Features, caching, case study-IIS, Apache.

UNIT II   (9 Hr.)

Information Architecture: Role, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Website Design: Development, Development phases, Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems, Good & bad web design, Process of Web Publishing. Web-site enhancement, submission of website to search engines, Web security: issues, security audit. Web effort estimation, Productivity Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, ,Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

UNIT III   (8 Hr.)

Technologies for Web Applications I: HTML and DHTML: Introduction, Structure of documents, Elements, Linking, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form Elements. Introduction to CGI, PERL, JAVA SCRIPT, JSP,PHP, ASP AJAX Cookies: Creating and Reading

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UNIT IV (7 Hr.)

Technologies for Web Applications II: XML: Introduction, HTML Vs XML, Validation of documents, DTD, Ways to use, XML for data files, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization, Semantic web, Semantic Web Services, Ontology

UNIT V (8 Hr.)

E-Commerce: Business Models, Infrastructure, Creating an E-commerce WebSite, Environment and Opportunities Modes & Approaches, Marketing & Advertising Concepts. Electronic Publishing issues, approaches, legalities and technologies, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act. Electronic Cash, Electronic Payment Systems: RTGS, NEFT, Internet Banking, Credit/Debit Card. Security: Digital Certificates & Signatures, SSL, SET, 3D Secure Protocol,

Recommended Books;

1. Roger S.Pressman, David Lowe, "Web Engineering", Tata Mc Graw Hill Publication, 2007
2. Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
3. Gopalan N P , Akilandeswari, "Web Technology: A Developer s Perspective" , PHI
4. Nail Gray, "Web server Programming" Wiley
5. Chris Bates, "Web Programming: Building Internetapplications" Wiley
6. Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi, 2009
7. "Web Technologies: Black Book", Kogent, Dreamtech
8. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology & Design ", Tata McGraw Hill.
10. Ivan Bay Ross, "HTML,DHTML,Java script,Perl CGI" , BPB

LIST OF EXPERIMENTS:

1. Program to show HTML Page Structure.
2. Program to show the Impact of HTML Headings.
3. Program to show the id attribute in HTM page.
4. Program to show The HTML <style> Element
5. Create The IT Department website home page for various tags.
6. Program to Make a hyperlink of an imageIN HTML.
7. Program to implement table in HTML.
8. Program for HTML Document, which provides a form that collects names and phone numbers.
9. JavaScript program to show factorial of a number.
10. Design a Home Page for IT Department OBST using various HTML Tags.

ITA-802(A)
Artificial Intelligence

ITA-802(A)	ARTIFICIAL INTELLIGENCE	3L:0T:0P	3 credits	3 Hrs/Week

OBJECTIVE:-

It presents the concepts of Artificial Intelligence and the participants will get to work in the areas of Machine learning, Deep Learning, Implement methods to solve problems using Artificial Intelligence and Natural Language Processing, etc.

OUTCOME:-

This course is designed in synchronization with the industry to provide the participants in-depth knowledge and skills required by AI fields around the globe. It provides comprehensive knowledge about the fundamental principles, methodologies and industry practices in AI.

- Fundamentals of neural networks and fuzzy logic.
- Supervised learning and unsupervised learning.
- Neurodynamical models

UNIT-I   (9 Hr.)

Introduction: Artificial Intelligence, AI Problems, AI Techniques, The Level of the Model, Criteria For Success. Defining the Problem as a State Space Search, Problem Characteristics, Production Systems, Search: Issues in The Design of Search Programs, Un-Informed Search, BFS, DFS; Heuristic Search Techniques: Generate-And-Test, Hill Climbing, Best-First Search, A*Algorithm, Problem Reduction, AO*Algorithm, Constraint Satisfaction, Means-Ends Analysis.

UNIT-II   (8 Hr.)

Knowledge Representation: Procedural Vs Declarative Knowledge, Representations & Approaches to Knowledge Representation, Forward Vs Backward Reasoning, Matching Techniques, Partial Matching, Fuzzy Matching Algorithms and RETE Matching Algorithms; Logic Based Programming-AI Programming languages: Overview of LISP, Search Strategies in LISP, Pattern matching in LISP, An Expert system Shell in LISP, Over view of Prolog, Production System using Prolog

UNIT-III   (8 Hr.)

Reasoning under Uncertainty: Introduction to Non-Monotonic Reasoning, Truth Maintenance Systems, Logics for Non-Monotonic Reasoning, Model and Temporal Logics; Statistical Reasoning: Bayes Theorem, Certainty Factors and Rule-Based Systems, Bayesian Probabilistic Inference, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic: Crisp Sets ,Fuzzy Sets, Fuzzy Logic Control, Fuzzy Inferences & Fuzzy Systems.

UNIT-IV   (7 Hr.)

Overview of Computational Intelligence and Artificial Evolution , Artificial Neural Networks (ANNs), Introduction to ANNs, Learning in ANNs, Supervised Learning in ANNs, Unsupervised Learning in ANNs, Reinforcement Learning in ANNs, Deep Learning in ANNs, Performance of ANNs.

UNIT-V   (8 Hr.)

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Artificial Evolution. Fundamentals of Evolution, Introduction to Evolutionary Computation (EC), Common EC Methods, Genetic Algorithms, Genetic Programming, Evolutionary Programming, Evolution Strategies, Grammatical Evolution, Cultural Evolution, Introduction to Artificial Life (ALife), Artificial Neural Networks and Artificial Evolution, Introduction to Neuroevolution, Topology Evolution, Learning Rule Evolution, Deep Neuroevolution.

TEXTBOOKS:-

1. Artificial Intelligence, George F Luger, Pearson Education Publications
2. Artificial Intelligence, Elaine Rich and Knight, Mcgraw-Hill Publications
3. Computational Intelligence: An Introduction, Second Edition, Andries P. Engelbrecht, 2007,
4. Bio-Inspired Artificial Intelligence: Theories, Methods, and Technologies, Dario Floreano and Claudio Mattiussi, 2008, The MIT Press
5. Writing for Computer Science, Third Edition, Justin Zobel, 2014, Springer

REFERANCES:-

1. Introduction To Artificial Intelligence & Expert Systems, Patterson, PHI
2. Multi Agent systems-a modern approach to Distributed Artificial intelligence, Weiss.G, MIT Press.
3. Artificial Intelligence : A modern Approach, Russell and Norvig, Prinice Hall

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SCHOOL OF ENGINEERING
SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES
Outcome based Curriculum for
Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

ITA-802(B)

Network Management

ITA-802(B)	NETWORK MANAGEMENT	3L:0T:0P	3 credits	3 Hrs/Week

OBJECTIVE:-

Network management and security are essential factors in the reliable, efficient, and secure operation of networks. As business become increasingly dependent on networking services, keeping these services running and secure becomes synonymous with keeping the business running. This course provides a thorough introduction to network management technologies and standards as well as to a wide variety of techniques for evaluating, monitoring, and defending the security of computer networks and systems.

OUTCOME:-

On the successful completion of the course, students will be able to

- Examine the need of security for the given network scenario.
- Criticize the preventive measures to secure routing and switching.
- offer the design of firewall, VPN and IDS / IPS for the given network.

UNIT-I   (8 Hr.)

Network Management Framework, Network Based Management, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Management, Accounting Management. Network Management Configuration: Centralized Configuration, Distributed Configuration, Selected Management Strategy

UNIT-II   (8 Hr.)

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View, Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents, Setting up LAN Access, SNMP Configuration.

UNIT-III   (9 Hr.)

Introduction. layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration. Internet Addresses, Internet protocol: Introduction. IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format. RARP Examples, RARP server design

UNIT-IV   (8 Hr.)

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Internet

and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP, Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

UNIT-V (7 Hr.)

Internet Control Message Protocols (ICMP):-Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation. IGMP Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package, Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

REFERENCES:

1. Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2. Stevens, TCP/IP Illustrated Volume-I, Pearson
3. J. Richard Barkey, Network Management Concept and Practice, PHI

ITA-803(A)

Internet Of Things

ITA-803(A)	INTERNET OF THINGS	3L:0T:0P	3 credits	3 Hrs/Week

OBJECTIVE:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

OUTCOME:

1. Able to understand the application areas of IOT
2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
3. Able to understand building blocks of Internet of Things and characteristics.

UNIT –I (7 Hr.)

Introduction:Definition, Characteristics of IOT, IOT Conceptual framework, IOT Architectural view, Physical design of IOT, Logical design of IOT, Application of IOT.

UNIT–II (8 Hr.)

Machine-to-machine (M2M), SDN (software defined networking) and NFV(network function virtualization) for IOT, data storage in IOT, IOT Cloud Based Services.

UNIT–III (9 Hr.)

Design Principles for Web Connectivity, Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, SOAP, REST, HTTP Restful and Web Sockets. Internet Connectivity Principles,Internet Connectivity, Internet based communication, IP addressing in IOT, Media Access control.

UNIT–IV (8 Hr.)

Sensor Technology, Participatory Sensing, Industrial IOT and Automotive IOT, Actuator, Sensor data Communication Protocols, Radio Frequency Identification Technology, Wireless Sensor Network Technology.

UNIT–V (8 Hr.)

IOT Design methodology: Specification requirement, process, model, service, functional & operational view, IOT Privacy and security solutions, Raspberry Pi & arduino devices, IOT Case studies, smart city streetlight control & monitoring.

REFERENCES:

1. Rajkamal,"Internet of Things", Tata McGraw Hill publication.
2. Vijay Madisetti and Arshdeep Bahga, "Internet of things(A-Hand-on-Approach)" 1st Edition ,Universal Press.
3. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.
4. Charless Bell "MySQL for the Internet of things", Apress publication.

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ITA-803(B)
MOBILE COMPUTING

ITA-803(B)	MOBILE COMPUTING	3L:0T:0P	3 credits	3Hrs/Week

OBJECTIVE:-

The objective of this course is to learn about the concepts and principles of mobile computing; to explore both theoretical and practical issues of mobile computing; to develop skills of finding solutions and building software for mobile computing applications

OUTCOME:-
Student will be able to:

- Describe the basic concepts and principles in mobile computing
- Understand the concept of Wireless LANs, PAN, Mobile Networks, and Sensor Networks
- Explain the structure and components for Mobile IP and Mobility Management
- Understand positioning techniques and location-based services and applications
- Describe the important issues and concerns on security and privacy Professional Skill
- Design and implement mobile applications to realize location-aware computing
- Design algorithms for location estimations based on different positioning techniques and platform
- Acquire the knowledge to administrate and to maintain a Wireless LAN Aistude
- Recognize the important issues and concerns on security and privacy

UNIT-I   (7 Hr.)

INTRODUCTION: Introduction to Mobile Computing –Applications of Mobile Computing-Generations of Mobile Communication Technologies-Multiplexing –Spread spectrum -MAC Protocols –SDMA-TDMA-FDMA-CDMA

UNIT-II   (9 Hr.)

MOBILE TELECOMMUNICATION SYSTEM: Introduction to Cellular Systems –GSM –Services & Architecture – Protocols –Connection Establishment –Frequency Allocation –Routing –Mobility Management –Security –GPRS-UMTS –Architecture –Handover –Security

UNIT-III   (8 Hr.)

MOBILE NETWORK LAYER: Mobile IP –DHCP –Ad Hoc-Proactive protocol-DSDV, Reactive Routing Protocols – DSR, AODV , Hybrid routing –ZRP, Multicast Routing-ODMRP, Vehicular Ad Hoc networks (VANET) –MANET Vs VANET –Security.

UNIT-IV   (8 Hr.)

MOBILE TRANSPORT AND APPLICATION LAYER: Mobile TCP-WAP –Architecture –WDP –WTLS –WTP – WSP –WAE –WTA Architecture –WML

UNIT-V   (8 Hr.)

MOBILE TRANSPORT AND APPLICATION LAYER: Mobile Device Operating Systems –Special Constraints & Requirements –Commercial Mobile Operating Systems –Software Development Kit: iOS, Android, BlackBerry, Windows Phone –M Commerce –Structure –Pros & Cons –Mobile Payment System –Security Issues

TEXT BOOKS:

1. JochenSchiller, ―Mobile Communications‖, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, ―Fundamentals of Mobile Computing‖, PHI Learning Pvt.Ltd, New Delhi – 2012

REFERENCES:

1. Dharma Prakash Agarwal, Qing and An Zeng, "Introduction to Wireless andMobile systems",Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklous and Thomas Stober, ―Principles of Mobile Computing‖, Springer, 2003.
3. William.C.Y.Lee,―Mobile Cellular Telecommunications-Analog and Digital Systems‖, Second Edition,TataMcGraw Hill Edition ,2006.
4. C.K.Toh, ―AdHoc Mobile Wireless Networks‖, First Edition, Pearson Education. 2002.
5. Android Developers : http://developer.android.com/index.html
6. Apple Developer : http://developer.apple.com/
7. Windows Phone DevCenter : http://developer.windowsphone.com
8. BlackBerry Developer : http://developer.blackberry.com

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107

ITA-804

Project Stage –II

ITA-804	PROJECT STAGE -II	0L:0T:16P	8 credits	16 Hrs/Week

Project -II should be the outcome of the training done/performed during after 7th semester. It should be submitted in hardware form (proto type)or simulation form along with proper data and certificates issued during project training. It should cover the electrical engineering aspects learned during training. A Power point presentation should also be submitted at the time of submission. It can be in the form of major project

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108

Ref. No.: S&BAS/IT/02.

Date: 14/06/2017

Name of Faculty: School of Engineering

Name of Department: Information Technology.

Minutes of Board of Studies Committee Meeting Dated on 14-06-2017

The Board of Studies Committee was held in room of Department of Information Technology at 1:00 PM, on 14-06-2017, Following members were present.

1. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal

2. Dr. Tryambak Hiwarkar, Prof., Chairman

3. Mr. Jitendra Sheetlani, Asst. Prof., Member

4. Mr. Manoj Verma, Asst. Prof., Member

5. Mr. Harsh Lohiya, Asst. Prof. Member

6. Mr Gaurav Saxena, Asst. Prof., Member

7. Mr. Rishi Khushwah, Asst. Prof., Member

8. Mr. Kailash Patidar, Asst. Prof., Member

9. Mr. Manoj Yadav, Asst. Prof., Member

10. Mr. Harsh Pratap, Asst. Prof., Member

11. Mr. Sudeesh Chouhan, Asst. Prof., Member

12. Mr. Narendra Sharma, Asst. Prof., Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:

Modification in Scheme and Syllabus of M Tech.(IT) III Sem.

Ref. No.: SoEB05/IT/02   Date: 14/06/2017

Discussion Scheme & Syllabus

Scheme and Syllabus was put before the members as per AICTE guidelines met the current demand in industry, it was discussed in details by the members and some modifications were suggested.

Resolution of the Discussion:

It was resolved that new Scheme and Syllabus of M Tech.(IT) III Sem follow the AICTE guidelines and which also met the current demand in industry, should be modified and may be accepted.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairman)

1.   Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal

2.   Dr. Tryambak Hiwarkar, Prof., Chairman

3.   Mr. Jitendra Sheetlani, Asst. Prof., Member

4.   Mr. Manoj Verma, Asst. Prof., Member

5.   Mr. Harsh Lohiya, Asst. Prof. Member

6.   Mr Gaurav Saxena, Asst. Prof., Member

7.   Mr. Rishi Khushwah, Asst. Prof., Member

8.   Mr. Kailash Patidar, Asst. Prof., Member

9.   Mr. Manoj Yadav, Asst. Prof., Member

10.   Mr. Harsh Pratap, Asst. Prof., Member

11.   Mr. Sudeesh Chouhan, Asst. Prof., Member

12.   Mr. Narendra Sharma, Asst. Prof., Member

Chairman

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Scheme of Examination

Third Semester – Master of Technology (Information Technology)

| S.No. | Subject Code | Subject Name | Periods per week | | | Credits | Maximum marks (Theory Slot) | | | Maximum Marks (Practical Slot) | | Total Marks |
			L	T	P		End Sem. Exam.	Tests (Two)	Assignmental Quiz	End Sem. Practical / Viva	Practical Recard/ assignment/Quiz/Presentation	
1.	MCIT 301	Elective I	3	1	-	4	70	20	10	-	-	100
2.	MCIT 302	Elective II	3	1	-	4	70	20	10	-	-	100
3.	MCIT 303	Seminar	-	-	4	4	-	-	-	-	100	100
4.	MCIT 304	Dissertation Part-1	-	-	8	8	-	-		120	80	200
		Total	6	2	12	20	140	40	20	120	180	500

L: Lecture-   T: Tutorial-   P: Practical

w.e.f. July- 2015

Elective –I (MCIT- 301)

(A) Ad-hoc Networks

(B) Parallel Computation and Applications

(C) Web Engineering.

(D) Cyber Law & Forensic

Elective-II (MCIT- 302)

(A) Software Testing & Quality assurance

(B) Data Mining and Warehousing.

(C) High Performance Computing

(D) Real Time Systems

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MCIT 301(A): Ad-hocNetworks

UNIT I

Ad Hoc Wireless : An introduction, Cellular vs Adhoc wireless Networks, Applications of Adhoc wireless Networks, Issues in Adhoc wireless N/WS, Heterogeneity in Mobile devices, Wireless Sensor N/WS, traffic Profiles, Types of Adhoc Mobile Communications, Types of Mobile Host movements, Challenges facing Ad hoc mobile N/WS, Model of operation, symmetric Links, Layer-2 Ad Hoc solutions, Proactive versus reactive protocols, multicast, commercial Applications of Ad Hoc networking, conferencing, Home Networking, Emergency services, personal Area Networks and Bluetooth, Embedded Computing Applications, Sensor Dust, Automotive/PC Interaction, Factors Affecting Ad Hoc.Networks, Scalability, Wireless Data Rates, DARPA packet Radio network, Survivable Radio Networks.

UNIT II

Adhoc Protocols :- Adhoc Wireless Media Access Protocols, Introduction Synchronous MAC Protocol &asynchronous MAC protocol, Problems in Adhoc channel Access Receiver Initiated MAC protocols, Sender. Initiated MAC Protocol, Existing Adhoc MAC Protocol.

UNIT III

Ad Hoc Routing Protocols: Table-Driven Approaches, DSDV, WRP ,CSGR, Source, Initiated On demand Approaches : AODV, DSR, TORA, SSR, LAR, PAR, ZRP, RDMAR., Multicast Routing in Mobile Ad Hoc Networks, Existing Ad Hoc Multicast Routing Protocols, ABAM : Associativity-Based Ad Hoc Multicast.

UNIT IV

Transport Layer for Ad Hoc Wireless Network : Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks. Other Transport Layer Protocols for Ad Hoc Wireless Networks.

UNIT V

Quality of service in Ad-hoc wireless networks: Issues and challenges in providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, MAC Layer Solutions, Network Layer Solutions, Qos Frameworks for Ad Hoc Wireless Networks. Security issues in Ad Hoc Network: Security in Ad Hoc Wireless Network, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management and Secure Routing in Ad Hoc Wireless Networks.

Books Suggested

1. Ad Hoc Mobile Wireless Networks : Protocols and Systems, C. K. Toh, Springer.
2. Ad Hoc Network, C E Perkins, Pearson Education.
3. Ad Hoc Wireless Networks : Architectures and protocols, C, Siva Ram Murthy and B.S. Manoj, Pearson Education.

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MCIT 301(B): ParallelComputationandApplications

UNIT I

Parallel Processing-Evolution of Parallel architectures-Applications of architectural Parallelism-Architectural classification schemes- parallelism in algorithms- Parameters characterizing algorithm parallelism- speedup and efficiency of parallel algorithms- architectures- interconnection networks.

UNIT II

Array Processors -SIMD array processors: SIMD computer organization- SIMD interconnection networks: static v/s dynamic, mesh connected ILLIAC network, MIMD Computers and Multiprocessors, Shared memory and message passing architecture – overview of shared memory multiprocessor programming- pipelined MIMD- multithreading.

UNIT III

Multiprocessor Architecture -Functional structures, UMA and NUMA multiprocessors. Interconnection Networks: Time shared or common buses, Cross bar switch and multiport memories, Comparison of multiprocessor interconnection structure, multistage networks for multiprocessors.

UNIT IV

Data dependence and Parallelism: Discovering parallel operations in sequential code- variables with complex names-sample compiler techniques - data flow principles-data flow architectures- Implementing Synchronization and Data Sharing: The character of information conveyed by synchronization - synchronizing different kinds of cooperative computations-waiting mechanisms- mutual exclusion using atomic read and write.

UNIT V

Parallel Programming: Shared memory programming, distributed memory programming, object oriented programming, data parallel programming, functional and dataflow programming.

References:

1. Harry F. Jordan and Gita Alaghband, "Fundamentals Of Parallel Processing", Pearson Education, 2003
2. Kaihwang and Faye A. Briggs, "Computer Architecture and Parallel Processing", McGraw Hill Series.
3. Kaihwang, "Advanced Computer Architecture – Parallelism, Scalability, Programmability".
4. Michael J. Quinn, "Parallel Computing – Theory and Practice", McGraw Hill Publication.

MCIT 301(C): WebEngineering

UNIT I

Introduction to Web Engineering : History, Web Applications, layering, DNS - encapsulation, de-multiplexing, client /server model, port numbers, standardization process, the Internet. Link layer: introduction, Ethernet and IEEE 802 encapsulation, trailer encapsulation, SLIP, PPP- Loop back interface, MTU.

Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet Mask special case of IP addresses, a subnet example.

UNIT II

Binding Protocol Address- Address Resolution Protocol & RARP, ARP & RARP, packet format, Encapsulation, Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Super-netting- special case of IP addresses, Ipv6-Motivation, frame format and addressing, comparison of Ipv4 and Ipv6.

UNIT III

ICMP: Introduction, ICMP Header, ICMP message types , ICMP timestamp request and reply, trace route, ping program, Intra & inter domain routing-distance vector routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP, Unicast Routing protocols, IGMP-IGMP message, operation, encapsulation.

UNIT IV

UDP: introduction, UDP Operation , header, checksum, IP Fragmentation, UDP Server design. DNS Introduction-basics, message format, simple example, pointer quires, resource records, caching, UDP, TFTP: introduction, protocol, security. BOOTP: introduction, packet format, server design, through router.

UNIT V

TCP: Introduction, TCP services, headers, connection establishment and termination, timeout of connection establishment- maximum segment size- half, close, state transition diagram, reset segments, simultaneous open and close- options, server design. SNMP Introduction, protocol, structure of management information, object identifiers, management information base, instance identification.

Telnet: rlogin protocols, examples, telnet protocol and examples. FTP, protocol, examples, SMTP protocols, examples, NFS, TCP/IP Applications.

References/Books:

1. W. Richard Stevens, TCP/IP Illustrated Volume-I "The Protocols ", Addison W 2

2. Jaiswal .S, TCP/IP Principles, Architecture, Protocols And Implementation, First Edition, Galgotia Publications Pvt Ltd.

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MCIT- 301 (D) CYBER LAW & FORENSIC

UNIT-I

Cyber world; an overview, internet and online resources, security of information, digital signature, intellectual property (IP), historical background of IP, IPR governance, National patent offices, the world intellectual property organization (WIPO).

UNIT-II

Introduction about the cyber space, cyber law, regulation of cyber space, scope of cyber laws: ecommerce; online contracts; IPRs (copyright, trademarks and software patenting), etaxation; e-governance and cyber-crimes, cyber law in India with special reference to Information Technology Act, 2000.

UNIT-III

Introduction to computer and cyber-crimes, Cyber-crimes and related concepts, distinction between cyber-crimes and conventional crimes, Cyber criminals and their objectives. Kinds of cyber-crimes cyber stalking; cyber pornography, forgery and fraud, crime related to IPRs, cyber terrorism; computer vandalism etc. Cyber forensics, computer forensics and the law, forensic evidence, computer forensic tools.

UNIT-IV

Regulation of cyber-crimes, Issues relating to investigation, issues relating to jurisdiction, issues relating to evidence, relevant provisions under Information Technology Act 2000, Indian penal code, pornography Act and evidence Act etc.

UNIT-V

Copyright issues in cyberspace: linking, framing, protection of content on web site, international treaties, trademark issues in cyberspace: domain name dispute, cyber-squatting, uniform dispute resolution policy, computer software and related IPR issues.

REFERENCES:

1. Nelson, Phillips, "Computer Forensics and Investigations", Cengage Learning India.
2. Vinod V. Sople, "Managing Intellectual Property" PHI Learning Private Limited.
3. Dr.R.K.Tiwari P.K.Sastri,K.V. Ravikumar, "Computer crime and Computer Forensics", First Edition 2002, Select publishers.
4. NIIT, Understanding Forensics in IT, PHI Learning.

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MCIT 302(A):Software Testing & Quality Assurance

Unit I

Introduction to software testing, concepts, issues and techniques, test activities, management and automation, Coverage and usage testing based on checklist, input domain portioning and boundary testing.

UNIT II

Object oriented testing: testing OOA and OOD models, object oriented testing strategies, test case design for OO software, testing methods applicable at the class level, interclass test case design. Web application testing, debugging, security & reliability.

UNIT III

The Software Quality Challenge - Software Quality Factors - Components of the Software Quality Assurance System. Pre-Project Software Quality Components -Contract Review - Development and Quality Plans.

UNIT IV

Programming style and program quality: simple style rules, comment statement, program quality, quantifying program quality, Software quality and quality Assurance: Principle of Software Quality Assurance (SQA). Applying SQA to software project, proven factors for SQA success, SQA during software requirements, SQA during software design phase. SQA during software code and test. Advance quality engineering topics.

UNIT V

Human factors in software engineering: Human factors history, HCI requirements and design process, HCI testing.

Reference Books:

1. Ali Behforooz and Frederick J. Hudson, Software Engineering Fundamentals, Oxford University Press

2. Jeff Tain, Software Quality Engineering: Testing, Quality Assurance and Quantifiable improvement, Willy Pub.

3. Aditya Mathur, Foundation of Software Testing 1/e, Pearson Education

4. Paul C. Jorgensen, Software Testing, A Craftsman's Approach, Second Edition, CRC Press

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MCIT 302(B): DataMiningandWarehousing

UNIT I

Data Mining: Basic concept ,technology and rules, application of data mining, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas,

UNIT II

Rules & Clustering Techniques: Introduction, Various association algorithms like A Priori,Partition, Pincer search etc., Generalized association rules, Clustering paradigms; Partitioning algorithms like K- Method, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; categorical clustering algorithms, STIRR, ROCK, CACTUS.

UNIT III

Data mining techniques: Exploration of data mining methodologies, decision tables, decision trees, classification rules, association rules, clustering, statistical models &linear models.

Web mining: Introduction to web mining techniques, web basics and HTTP, data sources on the web, personalization, working with logs, forms and cookies, user identification and path analysis. E-Metrics.

UNIT IV

Data Mining of Image and Video : A case study, Image and Video representation techniques, feature extraction, motion analysis, content based image and video retrieval, clustering and association paradigm, knowledge discovery.

UNIT V

Data warehousing : Data ware house, OLAP and Data mining, OLTP vs. OLAP, Data Warehouse Design Identifying facts & dimensions, designing fact tables, dimension tables, star flake schema query redirection, OLAP operations Data ware house High Performance Computing architecture, Multidimensional schemes:1 partitioning strategy, aggregation, data marting, metadata, Capacity planning, tuning the data warehouse testing the data warehouse: developing test plan, testing operational environment Distributed and virtual data warehouses.

ReferenceBooks:

1. Data Mining Techniques ; Arun K.Pujari ; University Press.

2. Data Mining; Adriaans & Zantinge; Pearson education.

3. Mastering Data Mining; Berry Linoff; Wiley.

4. Data Mining; Dunham; Pearson education.

MCIT 302(C): HighPerformanceComputing

UNIT-I

Introduction to high performance computing: Cluster, Grid, meta-computing, middle ware etc., examples of representative applications. Programming models: shared memory, message passing, peer-to-peer, broker-based. Introduction to PVM and MPI. Architecture of cluster-based systems, Issues in cluster design: performance, single-system-image, fault tolerance, manageability, programmability, load balancing, security, storage..

UNIT-II

High performance sequential computing: Effects of the memory hierarchy, Out-of-order execution, superscalar processors, Vector processing, Shared-memory processing: Architectures (extensions of the memory hierarchy), Programming paradigms, OpenMP Distributed-memory processing: Architectural issues(networks and interconnects), Programming paradigms, MPI (+MPI2)

UNIT-III

Grids: Computational grids, Data grids Architecture of Grid systems, Grid security infrastructure, Examples of Grids: Globus etc

UNIT-IV

Performance issues and measurement: Profiling and development tools, Sustained versus peak performance, Performance libraries and packages

UNIT-

The productivity crisis & future directions: Development overheads, Petaflops programming, New parallel languages: UPC, Titanium, Co-Array FORTRAN

BOOKS:

1. Charles Severance, Kevin Dowd "High Performance Computing", Second Edition by, O'reilly, Second Edition July 1998
2. David j. Kuck "High Performance Computing" Oxford Univ Pr, 1996
3. Gary W. Sabot "High Performance Computing " Add ison-Wesley, 1995

MCIT- 302 (D) REAL TIME SYSTEMS

UNIT I

Introduction to real time systems, structure, issues, task classes, performance measures for real time systems-their properties, traditional measures, cost functions and hard deadlines. Estimation of program run time-source code analysis, accounting for pipelining and caches.

UNIT II

Task Assignment and Scheduling-Rate monotonic scheduling algorithm, Preemptive earliest deadline first algorithm, Using primary and alternative tasks. Task Assignment-Utilization balancing algorithm, next fit for RM(Rate monitoring) scheduling. Bin packing assignment algorithm for EDF, Myopic offline scheduling(MOS) algorithm, Focused addressing and bidding(FAB) algorithm, Buddy strategy, Assignment with precedence conditions.

UNIT III

Programming Languages & Tools- Desired language characteristics, data typing, control structures, hierarchical decomposition, packages, run time error handling, Overloading and generics, Multitasking. Low level programming, Fcu, Euclid, Run time support.

UNIT IV

Real time Communication-Communication media, network topologies. Protocols Contention based, Token based, Stop-and-Go, Polled bus, Hierarchical round robin, deadline based.

UNIT V

Fault Tolerance Techniques- Fault, fault types, fault detection, fault and error containment, hardware and software redundancy, time redundancy, information redundancy. Reversal checks, Malicious or Byzantine failures, Integrated failure handling.

REFERENCES:-

1. C.M Krishna and Kang G. Shin, Real Time Systems, TMH
2. Stuart Bennett, Real time computer control and introduction, Pearson education, 2003
3. Jane W.S Liu, Real time systems, Mc-Graw Hill

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Sri Satya Sai
University of Technology and Medical Sciences

Ref. No. : SSS Bos/CoE/IT/01

Date: 08/06/2020

Name of Faculty: School of Engineering

Name of Department: Information Technology

Minutes of Board of Studies Committee Meeting Dated on 08-06-2020

The Board of Studies Committee of Information Technology was conducted a meeting in online mode via google meet at 3:30 PM. on 08-06-2020. Following members were present.

1. Dr. Rajeev Pandey, UIT, R.G.P.V. Bhopal
2. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
3. Mr. Arif Hakeem, Asst. Prof., Chairman
4. Mr. Manoj Verma, Asst. Prof., Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:

Modification in Scheme and Syllabus of M Tech.(IT) III Sem.

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Ref. No. : 3SS Bes/10E/IT/01   Date : 09/06/2020

Discussion Scheme & Syllabus

Scheme and Syllabus was put before the members as per AICTE guidelines met the current demand in industry, it was discussed in details by the members and some modifications were suggested.

Resolution of the Discussion:

It was resolved that new Scheme and Syllabus of M Tech.(IT) III Sem follow the AICTE guidelines and which also met the current demand in industry, should be modified and may be accepted.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairman)

1. Dr. Rajeev Pandey, UIT, R.G.P.V. Bhopal
2. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
3. Mr. Arif Hakeem, Asst. Prof., Chairman
4. Mr. Manoj Verma, Asst. Prof., Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

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Chairman

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Scheme of Examination

Third Semester – Master of Technology (Information Technology)

| S.No. | Subject Code | Subject Name | Periods per week | | | Credits | Maximum marks (Theory Slot) | | | Maximum Marks (Practical Slot) | | Total Marks |
			L	T	P		End Sem. Exam.	Two (Two)	Assignment/Quiz	End Sem. Final (Gd/Viva)	Practical Record/assignment/Quiz/Pre sentation	
1.	MCIT 301	Elective I	3	1	-	4	70	20	10	-	-	100
2.	MCIT 302	Elective II	3	1	-	4	70	20	10	-	-	100
3.	MCIT 303	Seminar	-	-	4	4	-	-	-	-	100	100
4.	MCIT 304	Dissertation Part- I	-	-	8	8	-	-		120	80	200
		Total	6	2	12	20	140	40	20	120	180	500

L: Lecture-   T: Tutorial-   P: Practical

w.e.f. July- 2015

Elective –1 (MCIT- 301)

(A) Ad-hoc Networks
(B) Parallel Computation and Applications
(C) Web Engineering.
(D) Cyber Law & Forensic
(E) Image Processing

Elective-II (MCIT- 302)

(A) Software Testing & Quality assurance
(B) Data Mining and Warehousing.
(C) High Performance Computing
(D) Real Time Systems
(E) Bioinformatics

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MCIT 301(A): Ad-hocNetworks

UNIT I

Ad Hoc Wireless : An introduction, Cellular vs Adhoc wireless Networks, Applications of Adhoc wireless Networks, Issues in Adhoc wireless N/WS. Heterogeneity in Mobile devices, Wireless Sensor N/WS, traffic Profiles, Types of Adhoc Mobile Communications, Types of Mobile Host movements, Challenges facing Ad hoc mobile N/WS. Model of operation, symmetric Links, Layer-2 Ad Hoc solutions, Proactive versus reactive protocols, multicast, commercial Applications of Ad Hoc networking, conferencing, Home Networking, Emergency services, personal Area Networks and Bluetooth, Embedded Computing Applications, Sensor Dust, Automotive/PC Interaction. Factors Affecting Ad Hoc Networks, Scalability, Wireless Data Rates, DARPA packet Radio network, Survivable Radio Networks.

UNIT II

Adhoc Protocols :- Adhoc Wireless Media Access Protocols, Introduction Synchronous MAC Protocol, &unynchronous MAC protocol, Problems in Adhoc channel Access Receiver Initiated MAC protocols, Sender, Initiated MAC Protocol, Existing Adhoc MAC Protocol.

UNIT III

Ad Hoc Routing Protocols: Table-Driven Approaches, DSDV, WRP ,CSGR, Source, Initiated On demand Approaches : AODV, DSR, TORA, SSR, LAR, PAR, ZRP, RDMAR., Multicast Routing in Mobile Ad Hoc Networks, Existing Ad Hoc Multicast Routing Protocols, ABAM : Associativity-Based Ad Hoc Multicast.

UNIT IV

Transport Layer for Ad Hoc Wireless Network : Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocols for Ad Hoc Wireless Networks.

UNIT V

Quality of service in Ad-hoc wireless networks: Issues and challenges in providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, MAC Layer Solutions, Network Layer Solutions, Qos Frameworks for Ad Hoc Wireless Networks. Security issues in Ad Hoc Network: Security in Ad Hoc Wireless Network, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, and Secure Routing in Ad Hoc Wireless Networks.

Books Suggested

1. Ad Hoc Mobile Wireless Networks : Protocols and Systems, C. K. Toh, Springer.
2. Ad Hoc Network, C E Perkins, Pearson Education.
3. Ad Hoc Wireless Networks : Architectures and protocols, C, Siva Ram Murthy and B.S. Manoj, Pearson Education.

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MCIT 301(B): ParallelComputationandApplications

UNIT I

Parallel Processing-Evolution of Parallel architectures-Applications of architectural Parallelism- Architectural classification schemes- parallelism in algorithms- Parameters characterizing algorithm parallelism- speedup and efficiency of parallel algorithms- architectures- interconnection networks.

UNIT II

Array Processors -SIMD array processors: SIMD computer organization- SIMD interconnection networks: static v/s dynamic, mesh connected ILLIAC network, MIMD Computers and Multiprocessors, Shared memory and message passing architecture – overview of shared memory multiprocessor programming- pipelined MIMD- multithreading.

UNIT III

Multiprocessor Architecture -Functional structures, UMA and NUMA multiprocessors. Interconnection Networks: Time shared or common buses, Cross bar switch and multiport memories, Comparison of multiprocessor interconnection structure, multistage networks for multiprocessors.

UNIT IV

Data dependence and Parallelism: Discovering parallel operations in sequential code- variables with complex names-sample compiler techniques – data flow principles-data flow architectures- Implementing Synchronization and Data Sharing: The character of information conveyed by synchronization - synchronizing different kinds of cooperative computations-wairing mechanisms- mutual exclusion using atomic read and write.

UNIT V

Parallel Programming: Shared memory programming, distributed memory programming, object oriented programming, data parallel programming, functional and dataflow programming.

References:

1. Harry F. Jordan and Gita Alaghband, "Fundamentals Of Parallel Processing", Pearson Education, 2003
2. Kaihwang and Faye A. Briggs, "Computer Architecture and Parallel Processing", McGraw Hill Series.
3. Kaihwang, "Advanced Computer Architecture – Parallelism, Scalability, Programmability".
4. Michael J. Quinn, "Parallel Computing – Theory and Practice", McGraw Hill Publication.

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MCIT 301(C): WebEngineering

UNIT I

Introduction to Web Engineering : History, Web Applications, layering, DNS - encapsulation, de-multiplexing, client /server model, port numbers, standardization process, the Internet, Link layer: introduction, Ethernet and IEEE 802 encapsulation, trailer encapsulation, SLIP, PPP- Loop back interface, MTU.

Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet Mask special case of IP addresses, a subnet example.

UNIT II

Binding Protocol Address- Address Resolution Protocol & RARP, ARP & RARP, packet format, Encapsulation, Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Super-netting- special case of IP addresses, Ipv6-Motivation, frame format and addressing, comparison of Ipv4 and Ipv6.

UNIT III

ICMP: Introduction, ICMP Header, ICMP message types , ICMP timestamp request and reply, trace route, ping program, Intra & inter domain routing-distance vector routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP, Unicast Routing protocols, IGMP-IGMP message, operation, encapsulation.

UNIT IV

UDP: introduction,UDP Operation , header, checksum, IP Fragmentation, UDP Server design, DNS Introduction-basics, message format, simple example, pointer quires, resource records, caching, UDP. TFTP: introduction, protocol security, BOOTP: introduction, packet format, server design, through router.

UNIT V

TCP: Introduction, TCP services, headers, connection establishment and termination, timeout of connection establishment- maximum segment size- half, close, state transition diagram, reset segments, simultaneous open and close- options, server design. SNMP Introduction, protocol, structure of management information, object identifiers, management information base, instance identification.

Telnet: rlogin protocols, examples, telnet protocol and examples, FTP, protocol, examples, SMTP protocols, examples, NFS, TCP/IP Applications.

ReferenceBooks:

1. W. Richard Stevens, TCP/IP Illustrated Volume-I "The Protocols ", Addison W 2

2. Jaiswal .S, TCP\IP Principles, Architecture, Protocols And Implementation, First Edition, Galgotia Publications Pvt Ltd.

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MCIT- 301 (D) CYBER LAW & FORENSIC

UNIT-I

Cyber world: an overview, internet and online resources, security of information, digital signature, intellectual property (IP), historical background of IP, IPR governance, National patent offices, the world intellectual property organization (WIPO).

UNIT-II

Introduction about the cyber space, cyber law, regulation of cyber space, scope of cyber laws; ecommerce; online contracts; IPRs (copyright, trademarks and software patenting), taxation; e-governance and cyber-crimes, cyber law in India with special reference to Information Technology Act, 2000.

UNIT-III

Introduction to computer and cyber-crimes, Cyber-crimes and related concepts, distinction between cyber-crimes and conventional crimes, Cyber criminals and their objectives. Kinds of cyber-crimes cyber stalking; cyber pornography, forgery and fraud, crime related to IPRs, cyber terrorism; computer vandalism etc. Cyber forensics, computer forensics and the law, forensic evidence, computer forensic tools.

UNIT-IV

Regulation of cyber-crimes, Issues relating to investigation, issues relating to jurisdiction, issues relating to evidence, relevant provisions under Information Technology Act 2000, Indian penal code, pornography Act and evidence Act etc.

UNIT-V

Copyright issues in cyberspace: linking, framing, protection of content on web site, international treaties, trademark issues in cyberspace; domain name dispute, cyber-squatting, uniform dispute resolution policy, computer software and related IPR issues.

REFERENCES:

1. Nelson, Phillips, "Computer Forensics and Investigations", Cengage Learning India.
2. Vinod V. Sople, "Managing Intellectual Property" PHI Learning Private Limited.
3. Dr.R.K.Tiwari P.K.Sastri,K.V. Ravikumar, "Computer crime and Computer Forensics", First Edition 2002, Select publishers.
4. NIIT, Understanding Forensics in IT, PHI Learning.

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MCIT-301 (E) IMAGE PROCESSING

UNIT I

Image representation, fundamental steps in image processing, image model, Sampling & quantization. Neighbors of a pixel, connectivity and distance measures. Basic transformations and perspective transformations. Two dimensional Fourier transform, Discrete Fourier transform and their properties. Fast Fourier transform, Walsh Transform, Hadamard transform and Discrete Cosine transform.

UNIT II

Image Enhancement:- Intensity transformations, histogram processing, Image subtraction, image averaging. Spatial filtering-smoothing and sharpening filters, frequency domain filtering methods-low pass filtering, high pass filtering, median filtering.

UNIT III

Image compression:- Redundancy and its types, Image compression model, variable length coding, bit plane coding, constant area coding, run length coding, lossless and lossy predictive coding, transform coding.

UNIT IV

Image restoration and Segmentation:- Degradation model, effect of diagonalisation on degradation, algebraic approach. Detection of discontinuities by point, line and edge detection. Edge linking, graph theoretic techniques, thresholding techniques, region oriented segmentation.

UNIT V

Representation & Description: Chain codes, polygonal approximations, signatures, boundary segments, skeleton, boundary descriptors, shape descriptors regional descriptors, image morphology-dilation, erosion, opening, closing, thickening, thinning, skeleton, pruning, hit or miss transform.

References:-

1. R.C Gonzalez & Richard E Wood, "Digital Image Processing", Addison Wesley Publishing
2. Anil K Jain, "Fundamentals of Digital image processing".
3. Sonka, Hlavac, Boyle, "Digital image processing and computer vision", cengage learning, India Edition.
4. B Chanda, D. Dutta Majumder, "Digital image Processing and Analysis", PHI.

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MCIT 302(A):SoftwareTesting&QualityAssurance

Unit I

Introduction to software testing, concepts, issues and techniques, test activities, management and automation, Coverage and usage testing based on checklist, input domain portioning and boundary testing.

UNIT II

Object oriented testing: testing OOA and OOD models, object oriented testing strategies, test case design for OO software, testing methods applicable at the class level, interclass test case design, Web application testing, debugging, security & reliability.

UNIT III

The Software Quality Challenge – Software Quality Factors - Components of the Software Quality Assurance System, Pre-Project Software Quality Components -Contract Review - Development and Quality Plans.

UNIT IV

Programming style and program quality: simple style rules, comment statements, program quality, quantifying program quality, Software quality and quality Assurance: Principle of Software Quality Assurance (SQA), Applying SQA to software project, proven factors for SQA success, SQA during software requirements, SQA during software design phase, SQA during software code and test, Advance quality engineering topics.

UNIT V

Human factors in software engineering: Human factors history, HCL requirements and design process, HCL testing.

Reference Books:

1. Ali Behforooz and Frederick J. Hudson, Software Engineering Fundamentals, Oxford University Press

2. JeffTian, Software Quality Engineering: Testing, Quality Assurance and Quantifiable improvement, Willy Pub.

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MCIT 302(B): DataMiningandWarehousing

UNIT I

Data Mining: Basic concept ,technology and rules, application of data mining, KDD v/s Data Mining, DBMS v/s Data Mining , DM techniques, Mining problems, Issues and Challenges in DM, DM Application areas.

UNIT II

Rules & Clustering Techniques: Introduction, Various association algorithms like A Priori,Partition, Pincer search etc., Generalized association rules. Clustering paradigms; Partitioning algorithms like K- Method, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; categorical clustering algorithms, STIRR, ROCK, CACTUS.

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4. Data Mining; Dunham; Pearson education.

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MCIT 302(C): HighPerformanceComputing

UNIT-I

Introduction to high performance computing: Cluster, Grid, meta-computing, middle ware etc., examples of representative applications. Programming models: shared memory, message passing, peer-to-peer, broker-based. Introduction to PVM and MPI. Architecture of cluster-based systems, Issues in cluster design: performance, single-system-image, fault tolerance, manageability, programmability, load balancing, security, storage..

UNIT-II

High performance sequential computing: Effects of the memory hierarchy, Out-of-order execution, superscalar processors. Vector processing. Shared-memory processing: Architectures (extensions of the memory hierarchy), Programming paradigms, OpenMP Distributed-memory processing: Architectural issues(networks and interconnects), Programming paradigms, MPI (+MP12)

UNIT-III

Grids: Computational grids, Data grids Architecture of Grid systems, Grid security infrastructure. Examples of Grids: Globus etc

UNIT-IV

Performance issues and measurement: Profiling and development tools, Sustained versus peak performance, Performance libraries and packages

UNIT-

The productivity crisis & future directions: Development overheads, Petaflops programming, New parallel languages: UPC, Titanium, Co-Array FORTRAN

BOOKS:
1. Charles Severance, Kevin Dowd "High Performance Computing", Second Edition by, O'reilly, Second Edition July 1998
2. David j. Kuck "High Performance Computing" Oxford Univ Pr, 1996
3. Gary W. Sabot "High Performance Computing " Add ison-Wesley, 1995

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MCIT- 302 (D) REAL TIME SYSTEMS

UNIT I

Introduction to real time systems, structure, issues, task classes, performance measures for real time systems-their properties, traditional measures, cost functions and hard deadlines. Estimation of program run time-source code analysis, accounting for pipelining and caches.

UNIT II

Task Assignment and Scheduling-Rate monotonic scheduling algorithm, Preemptive earliest deadline first algorithm, Using primary and alternative tasks. Task Assignment-Utilization balancing algorithm, next fit for RM(Rate monitoring) scheduling, Bin packing assignment algorithm for EDF, Myopic offline scheduling(MOS) algorithm, Focused addressing and bidding(FAB) algorithm, Buddy strategy, Assignment with precedence conditions.

UNIT III

Programming Languages & Tools- Desired language characteristics, data typing, control structures, hierarchical decomposition, packages, run time error handling, Overloading and genetics, Multitasking, Low level programming, Fex, Euclid, Run time support.

UNIT IV

Real time Communication-Communication media, network topologies. Protocols Contention based, Token based, Stop-and-Go, Polled bus, Hierarchical round robin, deadline based.

UNIT V

Fault Tolerance Techniques- Fault, fault types, fault detection, fault and error containment, hardware and software redundancy, time redundancy, information redundancy. Reversal checks. Malicious or Byzantine failures, Integrated failure handling.

REFERENCES:-

1. C.M Krishna and Kang G. Shin, Real Time Systems, TMH
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3. Jane W.S Liu, Real time systems, Mc-Graw Hill

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MCIT-302 (E) BIOINFORMATICS

UNIT-I

Introduction:-Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

UNIT-II

Bioinformatics Databases & Image Processing :- Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, protein purification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

UNIT-III

Sequence Alignment and database searching - Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

UNIT-IV

Gene Finding and Expression:- Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data.

UNIT-V

Proteomics & Problem solving in Bioinformatics:- Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences, Strategies and options for similarity search, flowcharts for protein structure prediction .

References:-

1. Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics & Proteomics, TMH Pub
2. Rastogi, Bioinformatics –Concepts, skills & Applications, CBS Pub
3. Bergeron, Bioinformatics computing, PHI
4. Claverie, Bioinformatics, Wiley pub

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