Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya

[University]

Enathur, Kanchipuram - 631 561.

B.E. COMPUTER SCIENCE AND ENGINEERING

SYLLABUS - 2015 ONWARDS

CHOICE BASED CREDIT SYSTEM FOR BE(CSE) FULL-TIME PROGRAMME
CREDITS

Theory courses: Courses with 3 credits will be assigned 3 Lecture, 2 Tutorial hours per week. **Practical courses: Courses** with 2 credits will be assigned 3 hours of lab/practical work per week

Each semester curriculum shall normally have a blend of theory and practical courses. In the first year the total number of credits will be 25.For Semester III to VII the average credits per semester will be 27 and for semester VIII credits will be 18. For the award of the degree a student has to earn a minimum of 195 credits.

DURATION OF THE PROGRAMME

A student is normally expected to complete BE(CS) programme in four years but in any case not more than seven years from the time of admission.

REGISTRATION FOR COURSES

A newly admitted student will automatically be registered for all the courses prescribed for the first year , without any option.

Every other student shall submit a completed registration form indicating the list of courses intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with the approval of the dean on the recommendation of the head of the department along with a late fee will be done, up to the last working day.

Registration for the project work shall be done only for the final semester.

ASSESSMENT

The break-up of assessment and examination marks for theory subjects is as follows.

Continuous Internal Assessment comprising of tests,

Assignments, Seminars, Group projects and attendance	:	40 Marks
Final Examination	:	60 Marks

The break-up of the assessment and examination marks for practical is as follows.

Continuous Internal Assessment comprising of tests,

Observation, Record work and attendance	:	40 Marks
Final Examination	:	60 Marks

The project work will be assessed for 40 marks by a committee consisting of the guide and a minimum of two members nominated by the head of the department. The head of the department may himself be a member or the chairman. 60 marks are allotted for the project work and viva voce examination at the end of the semester.

WITHDRAWAL FROM A COURSE

A student can withdraw from a course at any time before a date fixed by the head of the department prior to the second assessment, with the approval of the dean of the faculty on the recommendation of the head of the department.

TEMPORARY BREAK OF STUDY

A student can take a one-time temporary break of study covering the current year/semester and/or the next semester with the approval of the dean on the recommendation of the head of the department, not later than seven days after the completion of the mid-semester test. However, the student must complete the entire programme within the maximum period of seven years.

MOVEMENT TO HIGHER SEMESTERS

The following minimum credits must be earned by the student to move to a higher semester

To move to the fifth semester	:	45 credits

SUBSTITUTE ASSESMENT

A student who has missed, for genuine reasons accepted by the head of the department, one or more of the assessments of a course other than the examination, may take a substitute assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the fourth meeting of the respective class committees.

A student who wishes to have a substitute assessment for a missed assessment must apply to the head of the department within a week from the date of the missed assessment.

ATTENDENCE REQUIREMENTS

To be eligible to appear for the examination in a particular course, a student must put in a minimum of 80% of attendance in the course. However, if the attendance is 70% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in the course on payment of the prescribed condonation fee.

A student who withdraws from or does not meet the minimum attendance requirement in course must re-register for and repeat the course.

PASSING AND DECLARATION OF EXAMINATION RESULTS

All assessments of all the courses on the absolute mark basis will be considered and passed by the results passing board in accordance with the rules of the university. Thereafter, the controller of examinations shall convert the marks for each course to the corresponding letter grade as follows, compute the grade point average and cumulative grade point average , and prepare the grade cards.

90 to 100 marks	-	Grade 'S'
80 to 89 marks	-	Grade 'A'
70 to 79 marks	-	Grade 'B'
60 to 69 marks	-	Grade 'C'
55 to 59 marks	-	Grade 'D'
50 to 54 marks	-	Grade 'E'
less than 50 marks	-	Grade 'F'
Insufficient attendance	-	Grade 'I'
Withdrawn from the course	-	Grade 'W'

A student who obtains less than 50 marks out of 100 in the subject or less than 24 out of 60 in external exam or is absent for the examination will be awarded Grade 'F'.

A student who earns a grade of S,A,B,C,D or E for a course is declared to have successfully completed that course and earned the credits for that course. Such a course cannot be repeated by the student.

A student who obtains letter grade F in a course has to reappear for the examination in that course.

The following grade points are associated with each letter grade for calculating the grade point average.

S – 10; A-9; B-8; C-7; D-6; E-5; F-0

A student can apply for revaluation of one or more of his examination answer papers within a week from the date of issue of grade sheet to the student on payment of the prescribed fee per paper. The application must be made to the controller of examinations with the recommendation of the head of the department.

After results are declared, grade cards will be issued to the students. The grade card will contain the list of courses registered during the year/semester , the grades scored and the grade point average(GPA) for the year/semester.

GPA is sum of the products of the number of credits of a course with the grade point scored in that course, taken over all the courses for the Year/Semester , divided by the sum of the number of credits for all courses taken in that year/semester. CGPA is similarly calculated considering all the courses taken from the time of admission.

After successful completion of the programme, the degree will be awarded with the following classification based on CGPA.

For First Class with Distinction the student must earn a minimum of 212 credits within four years from the time of admission, pass all the courses in the first attempt and obtain a CGPA of 8.25 or above.

For First Class the student must earn a minimum of 212 credits within five years from the time of admission and obtain a CGPA of 6.5 or above.

For Second Class the student must earn a minimum of 212 credits within seven years from the time of admission.

ELECTIVES

Apart from the various core courses offered in the curriculum of the branch of specialisation, a student can choose a minimum of six electives from a list of electives offered by the department and from other departments with the approval of the head of the department and the head of the department offering the course.

COURSE CONTENT
&
SCHEME OF EXAMINATION

SCSVMV University
B.E (Computer Science and Engg., Credit Based System)

SEMESTER - III

SUBJECT CODE	Subject(Semester – III)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Applied Mathematics For Computers - I	3	2	0	3
	Applied Discrete Mathematics	3	2	0	3
	Analog & Digital Electronics	3	2	0	3
	Digital Logic & Computer Architecture	3	2	0	3
	Data Structures Using C	3	2	0	3
	Sanskrit & Indian Culture	1	0	0	1
	Hr Skills – I	1	1	0	1
	Digital Logic & Computer Architecture - Lab	0	0	3	2
	Data Structures Using C Lab	0	0	3	2
	Analog & Digital Electronics Lab	0	0	3	2
	Advanced C / C++ Lab	0	0	3	2
	TOTAL				**25**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

SEMESTER - IV

Subject Code	Subject(Semester – IV)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Applied Mathematics For Computers -Ii	3	2	0	3
	Analog & Digital Communications	3	2	0	3
	Microprocessor & Micro Controller	3	2	0	3
	Design And Analysis Of Algorithm Using C++	3	2	0	3
	Computer Graphics	3	2	0	3
	Sanskrit& Indian Culture	1	0	0	1
	HR Skills – II	1	1	0	1
	Analog & Digital Communications Lab	0	0	3	2
	Microprocessor & Micro Controller Lab	0	0	3	2
	Design And Analysis of Algorithm Using C++ Lab	0	0	3	2
	Computer Graphics Lab	0	0	3	2
	Total				**25**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

SCSVMV University
B.E (Computer Science and Engg., Credit Based System)

SEMESTER - V

Subject Code	Subject(Semester – V)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Automata Theory And Applications	3	2	0	3
	Database Management Systems	3	2	0	3
	Operating Systems	3	2	0	3
	Java Programming	3	2	0	3
	Elective – I	3	2	0	3
	Sanskrit & Indian Culture	1	0	0	1
	HR Skills – III	1	1	0	1
	Free Elective	2	0	0	2
	Database Management Systems Lab	0	0	3	2
	Operating Systems Lab	0	0	3	2
	Java Programming Lab	0	1	3	2
Total					**25**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

SEMESTER - VI

Subject code	Subject(Semester – VI)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Principles Of Compiler Design	3	2	0	3
	Computer Network	3	2	0	3
	Mobile Computing	3	2	0	3
	Elective – II	3	2	0	3
	Elective – III	3	2	0	3
	Sanskrit& Indian Culture	1	0	0	1
	HR Skills – IV	1	1	0	1
	Principles Of Compiler Design Lab	0	0	3	2
	Computer Network & Data Communication Lab	0	0	3	2
	Mobile Computing -Lab	0	0	3	2
	Web Technology - Lab	0	0	3	2
	TOTAL				**25**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

SCSVMV University
B.E (Computer Science and Engg., Credit Based System)

SEMESTER - VII

Subject Code	Subject(Semester – VII)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Resource Management Technique	3	1	0	3
	Software Engineering	3	1	0	3
	Elective – IV	3	1	0	3
	Elective – V	3	1	0	3
	Elective – VI	3	1	0	3
	Software Development Lab Using Case Tools	0	0	3	2
	Elective – IV Lab	0	0	3	2
	Elective – V Lab	0	0	3	2
	Elective – VI - Lab	0	0	3	2
	Project – I	0	0	8	4
	Total				**27**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

SEMESTER - VIII

Subject Code	Subject (Semester – VIII)	Ins. /Week in Hours			C (Units)
		L	T	P	
	Project - II	0	0	14	8
	Elective – VII	3	2	0	3
	Elective – VIII	3	2	0	3
	Elective –VI Lab	0	0	3	2
	Elective – VIII Lab	0	0	3	2
	Total				**18**

L – Lecture **T- tutorial** **P- Practical**
I- Internal **E- External** **C- Credits**

Examination Pattern for Sanskrit & Indian Culture paper

There will not be any external examination for Sanskrit and Indian culture paper to B.E / B. Tech courses all branches but performance of students will be assessed through tests and assignments conducted by the same department. The internal assessment pattern is as follows.

First test	30 Marks
Second test	30 Marks
Assignment (G.D + Seminar + Attendance + Class test)	40 Marks
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Total	100 Marks

Total Marks	100Marks
Passing Minimum marks	50%

In the last semester (B.E. - VIth) marks are allotted for test (50) and project work (50). A Candidate shall be declared to have passed the examination he/she should have secure a minimum mark of 50%.

III SEMESTER

MAUFT1231 – APPLIED MATHEMATICS FOR COMPUTERS I

3 2 0 3

(For students admitted from 2012-13)

PREREQUISITE:

Basic knowledge of Numerical methods, Laplace Transforms, Z-Transform, Fourier Transform, Application.

AIM:

1. The aim of this study is to provide an introduction to a variety of numerical methods for solving partial differential equations. The emphasis will be on understanding the fundamentals: the appropriateness of a given method for a given type of PDE (elliptic, parabolic and hyperbolic) and how to construct an accurate and stable numerical scheme to produce answers of the required precision.

2. The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. This course aims at providing the necessary basic concepts of a few numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
2. Student Views of Using the Laplace Transform in Solving Electric Circuits Problems
3. To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigate.
4. To acquaint the student with Fourier transform techniques used in wide variety of situations.
5. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.
6. Student Views of Using the Laplace Transform in Solving Electric Circuits Problems
7. To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

OUTCOME:

After completion of the course the students are expected to be able to:

1. The understanding of the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. Model several physical processes and to develop Z transform techniques for discrete time systems.

2. It helps the students to have a clear perception of the power of statistical and numerical techniques, ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.

UNIT – I
(INTERPOLATION AND NUMERICAL INTEGRATION)

Interpolation with equal intervals – Newton's forward interpolation formula – Newton's backward interpolation formula - Interpolation with unequal intervals: Lagrange's interpolation formula, Newton's divided difference formula - Numerical integration: Trapezoidal rule - Simpson's one-third rule - Simpson's three-eighth rule – Outline of applications of interpolation and numerical integration in engineering.

UNIT – II
(NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS)

Picard's method – Taylor series method - Euler's method – Modified Euler's method – Runge's method – Runge-Kutta method – Predictor-corrector methods: Milne's method, Adams Bashforth method – Outline of applications of numerical solutions of ordinary differential equations in engineering.

UNIT – III
(LAPLACE TRANSFORMS AND APPLICATIONS)

Transforms of elementary functions : $1, t^n, e^{at}, \sin at, \cos at, \sinh at, \cosh at$ - Properties of Laplace transforms: Linearity Property, First shifting property, Change of scale property – Transforms of derivatives - Transforms of integrals - Multiplication by t^n - Division by t - Evaluation of integrals by Laplace transform - Inverse transforms: Method of partial fractions – Other methods of finding inverse - Convolution theorem (Without proof) - Unit step function – Unit Impulse function - Application to differential equations – Outline of applications of Laplace transforms in engineering.

UNIT – IV
(FOURIER TRANSFORMS AND APPLICATIONS)

Fourier integral theorem (without proof) - Fourier Sine and Cosine integrals – Complex form of Fourier integral - Fourier integral representation of a function - Fourier transform – Fourier sine and Cosine transforms – Properties of Fourier Transforms: Linear property, Change of scale property, Shifting property - Parseval's identity for Fourier transforms (without proof) – Application of transforms to boundary value problems: Heat conduction, Vibrations of a string, Transmission lines

UNIT – V
(Z – TRANSFORM AND APPLICATIONS)

Standard z-transforms of $1, a^n, n^p$ – Linearity property – Damping rule – Shifting rules – Multiplication by n - Initial and final value theorems (without proof) – inverse z –transforms – Convolution theorem (without proof) – Convergence of z-transforms – Two sided z-transform – Evaluation of inverse z-transforms: Power series method, Partial fraction method, inversion integral method – Application to difference equations – Outline of applications of z-transform in engineering

Note: Questions are to be set on problem solving and not on the theoretical aspects.

TEXT BOOK

1. Grewal B.S, Higher Engineering Mathematics, 41st Edition, Khanna Publishers, New Delhi, 2011.

REFERENCE BOOKS

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons
2. Gerald C.F and Wheatley P.O, Applied Numerical Analysis, Addison-Wesley Publishing Company
3. Murrey R.Spiegel, Laplace Transforms, Schaum's Outlines, McGraw Hill

MAUFT1232– APPLIED DISCRETE MATHEMATICS

3 2 0 3

(For computer science engineering students admitted from 2012-13)

PRE-REQUISITE:

Understanding of math (in general Sets, Boolean Algebra, Graphs, State Machines, ideas of Algorithms)

AIM:

To introduce the student's foundational aspects of combinatorial mathematics via a selection of topics like graphs, relations, trees, state machine.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. To introduce a number of discrete mathematical structures found to be serving as tools in the development of theoretical computer science.
2. To focus on how discrete structures actually helped computer engineers to solve problems occurred in the development of programming languages.
3. To know about the importance of discrete structures towards simulation of a problem to computer science & engineering.

OUTCOME:

After completion of the course the students are expected to be able to

1. Have knowledge on various discrete structures.
2. Define the key concepts of graph theory and use graph structures to represent data sets and relations on them.
3. Deal with problems which may arrive in computer science & engineering.
4. Prepare for entrance examinations involving placement opportunities.

UNIT – I
(RELATIONS AND DIGRAPHS)

Product sets and partitions – Relations and digraphs – Paths in relations and digraphs – Properties of relations – Equivalence relations – Computer representation of relations and digraphs – Operations on relations – Transitive closure and Warshall's algorithm – Outline of applications of digraphs in information technology.

UNIT – II
(ORDER RELATIONS AND STRUCTURES)

Partially ordered sets – External elements of partial ordered sets – Lattices – Finite Boolean algebras – Functions of Boolean algebras – Circuit designs – Outline of applications of Boolean algebras in information technology.

UNIT – III
(TREES)

Trees – Labeled trees – Tree searching – Undirected trees – Minimal spanning trees – Outline of applications of trees in information technology.

UNIT – IV
(TOPICS IN GRAPH THEORY)

Graphs – Euler paths and circuits – Hamiltonian paths and circuits – Transport networks – Matching problems – Coloring problems – Outline of applications of graph theory in information technology.

UNIT – V
(LANGUAGES AND FINITE STATE MACHINES)

Semi groups (Definition only) – Product and quotients and semi groups (Definition only) - Languages **–** Representations of special grammars and languages – Finite state machines – Semi groups, machines and languages – Machines and regular languages – Simplification of machines – Outline of applications of finite state machines in information technology.

Note: Questions are to be set on problem solving and not on the theoretical aspects.

TEXT BOOK:

1. Kolman B., Busby R.C. and Ross S., Discrete Mathematical Structures for Computer Science, Fifth Edition, Prentice Hall of India, New Delhi, 2006.

REFERENCE BOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw Hill
2. Susanna S. Epp, Discrete Mathematics with applications, Brookes/Cole Publishing Company
3. J.P.Trembley, R.Monahor, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, New Delhi

ANALOG AND DIGITAL ELECTRONICS

3 2 0 3

(For Students admitted from 2014 onwards)

PREREQUISITE:

Basic Electronics

AIM:

The aim of this course is to understand the concepts and to familiarize the student with the principle of operation, capabilities and limitations of various electron devices so that he will be able to use these devices effectively and to have a basic knowledge in digital electronics.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Understand the Diode operation and switching characteristics.
2. Understand the Operation of BJT, FET, MOSFET metal semiconductor rectifying and ohmic contacts,
3. Study the characteristics and some applications of OPAMP.
4. Study various number systems and to simplify the mathematical expressions using Boolean functions - simple problems.
5. Study implementation of combinational circuits.

OUTCOME:

After completion of the course the students are expected to be able to

1. Develop through basic knowledge on the behavior and the characteristics of semiconductor junction,
2. Acquire knowledge on the applications of BJT, FET, MOSFET.
3. Distinguish clearly between an ideal and actual characteristics of an Op-amp. And to learn different linear applications.
4. Understand the basic number system and Boolean algebra.
5. Understand the basics of combinational circuits.

UNIT – I
SEMICONDUCTORS & DIODES

Semiconductor fundamentals –Energy Band diagram – Intrinsic and Extrinsic Semiconductors-Working and description of a PN diode– Varactor Diode –Avalanche and Zener Breakdown – Zener diode –Photo diode – Photo voltaic cell – Light emitting diode – Liquid crystal display – Light dependant resistor - Single –phase, half-wave and full-wave rectifiers – Bridge rectifiers.

UNIT – II
TRANSISTORS

Principle of transistor action – Cut off, Active and saturation regions of a transistor – CE,CB,CC Configurations –Transistor as a switch – Use of a heat sink – Constructional features of a field effect transistor –theory of operation–MOSFET –Working and V-I Characteristics – Depletion and enhancement types –Working and V-I characteristics of UJT – SCR, DIAC,TRIAC.

UNIT – III
CHARACTERISTICS OF OPAMP

Ideal OP-AMP characteristics, DC characteristics, AC characteristics, offset voltage and offset current, CMRR, Slew rate, virtual ground concept, Inverting and Non-inverting amplifier, voltage follower, summer, multiplier, differentiator and integrator, comparators, Schmitt trigger, multivibrators (Astable), D/A converter (R-2R ladder), A/D converters(Successive - Approximation).

UNIT – IV
BOOLEAN ALGEBRA AND LOGIC FUNCTIONS

Review of Number systems and their conversions.

Boolean Algebra: Introduction to Boolean algebra - The AND, OR and NOT operations. Laws of Boolean algebra. Minimization of Boolean expression. Boolean expressions and logic diagrams. Universal building blocks. Negative logic.

Logic Simplifications: Truth tables and maps. Sum-of-products and product-of-sums. Simplification of logic functions using Karanaugh map Minimization and Quine-McCluskey method of minimization.

UNIT – V
COMBINATIONAL AND SEQUENTIAL CIRCUITS

Combinational Circuits: Half Adder, Full Adder, Half Subtractor and Full Subtractor, Number complements. Multiplexer - Demultiplexer, Decoder and Encoder code converters – BCD to Excess3, Gray, and Seven Segment Display Conversions – Parity Generator and Checkers. Sequential Circuits: Basic latch circuits - Flip-flops, truth table and excitation table. Shift Registers.

TEXT BOOKS

1. Millman and Halkias, Electronic devices and Circuits, Tata McGraw Hill International,Edition,Second Edition 2008.
2. D.Roy Choudhary, Sheil B.Jani, 'Linear Integrated Circuits', II edition, New Age, 4e, 2010.
3. M.Morris Mano & Charles kime pearson 2013– Digital Logic & Computer Design – PHI, fourth Edition, 1999.

REFERENCE BOOKS

1. Salivahanan Electronic devices and Circuits, second editionTata McGraw Hill International, 2011.
2. David A.Bell, (Fundamentals of EDC) Electron Devices and Circuits, Prentice Hall Of India, 5e,2009.
3. Jacob Millman, Christos C.Halkias, 'Integrated Electronics - Analog and Digital circuits system', Tata McGraw Hill, 2e 2011.
4. Anand Kumar: Switching Theory and Logic Design – PHI, second Edition 2014.

DIGITAL LOGIC AND COMPUER ARCHITECTURE

3 2 0 3

(For Students admitted from 2014 onwards)

PREREQUISITES:

Data Structures and Algorithms, and Computer Science I or comparable Programming experience.

AIM:

The aim of the course is good understanding of logical digital circuits and getting knowledge about computer architecture.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Reviewing of number System with basic theorems and Properties of Boolean algebra and function and simplifying Boolean function using K maps and tabulation method. Understanding of the clocking methodologies necessary to manage the flow of information and preservation of circuit state.
2. To study the simple design of combinational logic including the basic gates, decoders, encoders, multiplexers, demultipexers, adders and subtractors.
3. To have a thorough understanding of the basic structure and operation of a digital computer.
4. To study the different ways of CPU organization and various instruction types and to study the instruction formats and addressing modes.
5. To study the different ways of communicating with I/O devices and standard I/O interfaces and to study the hierarchical memory system including cache memories and virtual memory.

OUTCOMES:

After completion of the course the students are expected to be able to:

1. Knowledge and understanding - Minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh map or Tabulation Method). Cognitive skills (thinking and analysis). Define the problem (Inputs and Outputs), write its functions.
2. Implement functions using Combinational digital circuit.
3. Have knowledge in analyzing and designing procedures of Combinational circuits. An ability to design advanced memory hierarchies- An ability to select appropriate computer systems for given application domains .Understand what hardware and software problems will require solutions for future generations.

UNIT – I
NUMBER SYSTEM & BOOLEAN ALGEBRA

Review of number system: types and conversion codes. Basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms. Simplification of Boolean functions using K-maps & tabulation method.

UNIT – II
COMBINATIONAL CIRCUITS

Digital logic gates-Design procedure – Adders-Subtractor, code converters Parallel adder/ Subtractor- Carry look ahead adder-BCD adder, Magnitude Comparator- encoder / decoder-Multiplexer/ Demultiplexer. Boolean function implementation using logic gates and MUX.

UNIT – III
BASIC COMPUTER ORGANISATION

Instruction Codes - Computer registers - Computer Instructions-timing and Control-Instruction Cycle-Memory Reference instructions-Input/Output Instructions -Complete computer Description.

UNIT – IV
CPU ORGANISATION

Introduction – General Register Organization-Stack Organization-Instruction formats-Addressing modes-Data Transfer and manipulation - Program Control.

UNIT – V
INPUT / OUTPUT AND MEMORY ORGANIZATION

Input/output Interface-Asynchronous Data Transfer- Priority Interrupt-Direct Memory Access - Memory Hierarchy-Main memory-Auxiliary memory-Cache memory-Virtual memory-Memory Protection.

TEXT BOOKS

1. M. Morris Mano, Digital Logic and Computer Design', Prentice Hall of India, Eastern Economy edition 2008 (1, 2 units)
2. M.Morris Mono, Computer System Architecture. Prentice Hall of India (Pvt) Ltd, New Delhi. Third Edition 1994.

REFERENCE BOOKS

1. Charles H.Roth, 'Fundamentals Logic Design', Jaico Publishing, IV edition, 2002.
2. Floyd, 'Digital Fundamentals', 8th edition, Pearson Education, 2003
3. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education.

DATA STRUCTURES USING C

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic Knowledge on C Programming**.**

AIM:

The purpose of this course is to impart knowledge on various data structures concepts to the students.

OBJECTIVES:

The student should be made to:

1. Learn linear data structures – list, stack, and queue.
2. Learn Non linear data Structures-Trees.
3. Be exposed to sorting, searching, hashing algorithms.

OUTCOME:

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

1. Implement application of linear and nonlinear data structures.
2. Apply the different linear data structures to problem solutions.
3. Critically implement the various algorithms.

UNIT I
INTRODUCTION TO DATA STRUCTURES AND LINKED LIST

Definitions of Data Structure and Algorithm - Arrays - Structures, Unions, Pointers- Abstract Data Type (ADT) – Introduction to Linked list-Single, Double and Circular linked lists.

UNIT II
LINEAR DATA STRUCTURE

Stacks- Array representation, linked list representation- Application - Infix, Postfix and prefix notation, Evaluating Postfix Expression, Converting an infix Expression to Postfix.

Queue-Array representation, linked list representation- Double ended queue-Circular queue-Priority queue.

UNIT III
NON LINEAR DATA STRUCTURE

Trees**-** Basic tree concepts-Binary trees-Tree Traversal Techniques- Pre order , Post order , In order-Application of tree-Introduction to Balanced Search trees-AVL trees-B-Trees-Graphs-Operations-DFS-BFS-Implementation-Storage Structures.

UNIT IV
SORTING

Bubble sort-Radix sort-Binary Tree sort- Heap sort- Insertion sort -Shell sort-Bucket sort-Address calculation sort.-selection sort.

UNIT V
SEARCHING

Searching – Introduction to search-Linear search, Indexed Sequential Search, Binary search, Interpolation search, Hash search. Hashing –Hashing Fundamentals-Hash function-Hashing methods-collision resolution technique.

TEXT BOOKS :

1. Seymour Lipschutz – "Theory and Problems of Data Structures".(AVL Trees,B-Trees), Tata mcgraw Hill, Edition 2006 20th Reprint 2011
2. Ellis Horowitz & Sartaj Sahani – "Fundamentals of Data Structures in C " – W.H. Freeman and Co., 2nd Edition, 2007
3. Jean Paul Tremblay & Paul Sorenson – "An Introduction to Data Structures with Applications" – TMH., 2nd Edition, 15th Reprint 1999 (Address calculation sort)

REFERENCE BOOKS :

1. Mark Allen Weiss – "Data Structures and Analysis in C" - Pearson Education Pubs.
2. Aho, Hopcroft, Ullman – "Data Structures and algorithms" – Pearson Education .
3. Behrouz A.Forouzan, Richard Gilberg, "Computer Science – Structured Programming Approach Using C ", 2nd Ed, Thomson Asia, 2001.

Sanskrit & Indian Culture

1 0 0 1

Unit - I (Gītā)

1. Introduction to Jñānayoga
2. Introduction to Bhaktiyoga
3. Introduction to Karmayoga

Unit - II (Upaniṣadic principles)

4. Introduction to Śaṅkara's Phillosophy
5. Introduction to Rāmānuja's Phillosophy
6. Introduction to Mādhva's Phillosophy

Unit - III

7. Amazing creations in Sanskrit (Varnacitras, Sthānacitras and Svaracitras, Gaticitras, Citrabandanas)
8. Intercity verses in Sanskrit, some intercity discoveries, Sanskrit and artificial intelligence beauty and charm of Sanskrit Poetry.
9. Stotrakāvyas and its relevance

Unit - IV

10. Introduction to Maths
11. Introduction to Physics and Chemistry
12. Introduction to Environmental science

Unit - V

13. Introduction to Yoga
14. Introduction to Botany & Zoology
15. Introduction to Agriculture

Reference Texts

1. The wonder that was India by Arthur Llewellyn Basham – 1971
2. The wonder that is Sanskrit by Sampadananda Misra – 2002
3. Vedic Science & Technology by Sadasiva Biswal and Bidyut Lata Ray – 2009
4. Vedavijnanasree by Urmila Srivatsava - 2002

SYLLABUS FOR II B.E. SEMESTER III & IV FROM 2014 – 2015 0NWARDS

1 1 0 1

English as a subject is being introduced for second year B.E/B.Tech students from 2014-2015. The objective is to impart intensive teaching to enable them to communicate in English both at the spoken and written levels. The expectations of the campus recruiters and other agencies are taken into consideration.

1. Words Misused
2. Homonyms and Homophones
3. One word substitution
4. Phrases and Clauses
5. Rearrangement of Sentences
6. Spotting Errors

BOOKS FOR REFERENCE:

1. Objective General English – Dr. R.S. Aggarwal (S.Chand and Co Pvt Ltd, New Delhi 110 055).
2. Essential English – A.P. Bharadwaj (S.Chand and Co Pvt Ltd, New Delhi 110 055).
3. English Grammar and Composition - Wren and Martin
4. English for Engineering Students – Dr. Sumant (VijayNicholas Publication)
   (Relevant portions in the syllabus will be selected from the books prescribed and given in a consolidated form to students.)

ASSESSMENT:

I. Examination for both the Semesters will be through Internal Assessment only. This will be for 100 marks each. A candidate has to secure 50% for a pass.

II. Internal Assessment will comprise of both oral and written examinations for 40 Marks.

III. End Semester Examination is of Practical Mode for 100 marks and this will be converted to 60.

DIGITAL LOGIC AND COMPUER ARCHITECTURE LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basics of Logic gates and circuits.

AIM :

The aim of the course is good understanding practically in logical digital circuits and getting knowledge about computer architecture.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Two-level logic functions with AND, OR, NAND, NOR and XOR gates with minimum number of gate delays or literals.
2. To design combinational circuits using decoders, ROM and transmission gates.
3. The operation of state-of-the-art components to design and build complex digital systems.
4. Such as memories, PLA, PALs and programmable logic devices (such as FPGAs).
5. To use state machine diagrams to design finite state machines using various types of flip-flops and combinational circuits with prescribed functionality.
6. To identify a paper related to the application of digital systems in society, read and summarize the paper.
7. To articulate how modern microelectronics has impacted society.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Ability to understand various hardware components on the computer system and Dismantling and assembling of PC.
2. To perform elementary manipulations of Boolean algebraic equations; simplify logic expressions; design combinational and sequential circuits.
3. To implement Multiplexer/Demultiplexer, Encoder/Decoder, Synchronous/Asynchronous Counter
4. To implement Seven segment display systems (with Counters & Decoders)
5. To Design the combinational circuits using PLAs and PALs.

LIST OF EXPERIMENTS

1. Recognize various components of PC.
2. Dismantling and assembling of PC.
3. Use of Hardware Trainer Kit.
4. Adder/Subtractor
5. Nand/Nor Implementations
6. Multi-Level NAND/NOR Circuits
7. Ripple Carry Adders
8. Carry Lookahead
9. Multiplexer/Demultiplexer
10. Encoder/Decoder
11. Asynchronous Counter
12. Synchronous counter
13. Shift register – Right/ Left/Serial/Parallel
14. Code Converters – Binary to Gray, BCD to Excess 3
15. BCD Adders
16. Comparators
17. Seven segment display systems (with Counters & Decoders)
18. Design of combinational circuits using PLAs and PALs.

DATA STRUCTURES USING C- LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Knowledge on C Programming**.**

AIM:

To develop programming skills in design and implementation of data structures and their applications

OBJECTIVES:

The students should be made to:

1. Be familiar with c programming.
2. Learn to implement Linear and Nonlinear data structures.
3. Learn to implement sorting and searching algorithms.

OUTCOME:

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

1. Design and implement C programs for implementing stacks, queues, linked lists.
2. Apply good programming design methods for program development.
3. Apply the different data structures for implementing solutions to practical problems.
4. Develop searching and sorting programs.

LIST OF PROGRAMS

1. Implementation of Stack
2. Implementation of Queue
3. Convert an Infix expression to postfix.
4. Evaluate the given postfix expression.
5. Implementation of Linked List.
6. Implementation of Doubly linked list.
7. Perform Traversals on a Binary Tree.
8. Sort the Given Numbers using.
    i) Bubble sort
    ii) Selection Sort.
9. Sort the given Elements using Heap Sort.
10. Implement linear and Binary Search algorithms
11. Implement BFS and DFS algorithms.

ANALOG AND DIGITAL ELECTRONICS LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Comfortable programming in Basic Electronics

AIM:

This lab aims to help students to prepare for the placement process and to be strong in Analog and Digital Electronics.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Understand the Diode operation and switching characteristics.
2. Understand the Operation of BJT, FET, MOSFET metal semiconductor rectifying and ohmic contacts,
3. Study the characteristics and some applications of OPAMP.
4. Study various number systems and to simplify the mathematical expressions using Boolean functions - simple problems.
5. Study implementation of combinational circuits.

OUTCOME:

After successfully completing this course a student should be able to

1. Develop through basic knowledge on the behavior and the characteristics of semiconductor junction,
2. Acquire knowledge on the applications of BJT, FET, MOSFET.
3. Distinguish clearly between an ideal and actual characteristics of an Op-amp. And to learn different linear applications.
4. Understand the basic number system and Boolean algebra.
5. Understand the basics of combinational circuits.

LIST OF EXPERIMENTS

1. V-I characteristics of PN & Zener diode.
2. Characteristics BJT (CE mode)
3. Characteristics of JFET
4. Characteristics of SCR/UJT
5. Op-amp characteristics – Slew rate verifications, CMRR, Input-Offset voltage.
6. Applications of Op-amp-I-Inverting, Non-Inverting, Adder & Subtractor.

7. Applications of Op-amp II – Differential Amplifier, Comparator, Integrator & Differentiator.
8. Implementation of Boolean functions, Adder / Subtractor Circuits.
9. Implementation of Multiplexer/ Demultiplexer Circuits.
10. Implementation of Code converters (Gray to Binary, Binary to Gray, Excess-3 to BCD and BCD to Excess-3).
11. Study of flip-flops - JK, RS, D &T FF.
12. Shift registers – SISO, PIPO, PISO and SIPO.

ADVANCED PROGRAMMING WITH C / C++

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Comfortable programming in C / C++

AIM :

This lab aims to help students to prepare for the placement process and to be strong in C / C++ programming.

OBJECTIVES:

The objective of the course is to impart knowledge on:

In addition to the aptitude, verbal reasoning many top companies like HCL, IBM and TCS includes c/c++ objective questions in their placement paper. To fit to the industry expectation, this lab is designed.

OUTCOME:

After successfully completing this course a student should be able to

1. Increase confidence level in his/her programming knowledge.
2. Bridge the gap between industry expectation and classroom scenario.

LIST OF EXERCISES

1. At least 20 unique problems which tests the data types and scope of the variables' life time.
2. At least 20 unique problems which tests the operators' precedence.
3. At least 20 unique problems to understand the decision making statement (if clauses and switch statement).
4. At least 20 unique problems to workout in looping statements.
5. At least 20 unique problems with pointer, string handling and dynamic memory allocation.
6. Program to implement variable arguments in C functions .
7. Program to implement pointer to function in C.
8. Program to implement default arguments in C++.
9. Program to implement exception handling in C++.
10. Program to implement user defined namespace in C++.
11. Program to implement Multithreading in C++.
12. Web Programming with C++.
13. Program to implement signal (interrupts) handling in C/C++.

14. Simple programs using C++ STL.
15. Simple programs using graphics concepts in C / C++.

TEXT BOOKS:

1. Yashavant Kanetkhr, “Let Us C”, Bpb Publications, 13th Edition.
2. Herbert schildt , C++ the Complete Reference, McGrw-Hll; Osborne Media, 5th Edition.

REFERENCE

1. http://placementpapers.students3k.com.
2. Refer placement papers of top companies time to time.

IV SEMESTER

MAUFT1241– APPLIED MATHEMATICS FOR COMPUTERS II

3 2 0 3

(For students admitted from 2012-13)

PRE-REQUISITE:

Basic knowledge of PDE, integration and probability.

AIM:

To develop techniques from PDE, Fourier series, numerical methods for solving partial differential equations of elliptic, hyperbolic and parabolic type and statistical concepts and methods .

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Aware of several different types of PDE s and its solution.
2. To develop techniques from PDE, Fourier series, relevant to applications in engineering.
3. Introduction to the analysis and design of numerical methods for solving partial differential equations of elliptic, hyperbolic and parabolic type.
4. To explain the statistical concepts and methods that can contribute to effective engineering design and high-quality industrial production.

OUTCOME :

After successfully completing this course a student should be able to

1. Formulate partial differential equations, and solution of PDE.
2. solve homogeneous linear PDE with constant coefficients and Lagrange's linear PDE.
3. find Fourier series for the given function
4. solve partial differential equations of elliptic, hyperbolic and parabolic type numerically.
5. apply various probability distributions to solve practical problems.

UNIT – I
(FOURIER SERIES)

Euler's Formulae (Without Proof) – Condition for Fourier expansion – Functions having points of discontinuity – Change of interval – Expansions of even and odd functions - Half-Range series – Parseval's formula (without proof) – Root mean square value (without proof) – Typical waveforms (Definition Only): Square wave form, Saw toothed waveform, Modified saw toothed waveform, Triangular waveform, Half wave rectifier, Full wave rectifier - Outline of applications of Fourier series in engineering

UNIT – II
(PARTIAL DIFFERENTIAL EQUATIONS)

Formation of partial differential equations – Solution of a partial differential equation – Equations solvable by direct integration – Linear equations of first order – Non linear equations of the first order – Charpit's method - Homogeneous linear equations with constant coefficients

–Rules for finding complementary functions – Rules for finding particular integral – Solution of homogeneous linear equation of any order.

UNIT – III
(NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS)

Classification of second order equations – Finite difference approximation to derivatives – Elliptic equations: Laplace Equation, Poisson's equation – Solution of Laplace's equation – Solution of Poisson's equation – Parabolic equations: Heat equation – Solution of heat equation – Hyperbolic equations: Wave equation – Solution of wave equation – Outline of applications of numerical solution of partial differential equations in engineering.

UNIT – IV
(PROBABILITY THEORY)

Random experiment – Mathematical, statistical and axiomatic definitions of probability – Conditional probability – Independent events - Theorem of total probability – Theorem of probability of causes: Bayes's theorem – Bernoulli's trials – De Moivre-Laplace approximation – Generalization of Bernoulli's theorem multinomial distribution – Outline of applications of probability theory in engineering.

UNIT – V
(THEORETICAL DISTRIBUTIONS)

Binomial distribution: Properties and constants of Binomial distribution – Fitting a Binomial distribution - The multinomial distribution – Negative Binomial distribution – Poisson distribution: Properties and constants of Poisson distribution – Fitting a Poisson distribution – Hyper-geometric distribution – Normal distribution: Properties and constants of Normal distribution – Fitting a normal curve – Outline of applications of theoretical distributions in engineering

TEXT BOOKS

1. Grewal B.S, Higher Engineering Mathematics, 41st Edition, Khanna Publishers, New Delhi, 2011.
2. Gupta S.P, Statistical Methods, 28th Edition, Sultan Chand and Sons., New Delhi, 1997.

REFERENCE BOOKS

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons
2. Gerald C.F and Wheatley P.O, Applied Numerical Analysis, Addison-Wesley Publishing Company
3. Richard Isaac, The Pleasures of Probability, Springer Verlag, 1995.

ANALOG AND DIGITAL COMMUNICATION

3 2 0 3

(For Students admitted from 2014 onwards)

PREREQUISITE:
Basic Electronic.

AIM :

To study the various analog communication fundamentals viz., Amplitude modulation and demodulation; Angle modulation and demodulation. To introduce the basic concepts of digital modulation techniques.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. Study the need of modulation, Amplitude Modulation and demodulation
2. Provide various Angle modulation and demodulation
3. Understand different methods of pulse digital modulation and demodulation schemes.
4. Study some basic information theory with some channel coding theorem. Analyze pass band digital modulation and demodulation schemes and compare its bit error probability.

OUTCOME :

After completion of the course the students are expected to be able to

1. Understand the need for modulation and amplitude modulation techniques.
2. Understand frequency modulation, demodulation and the comparison of AM and FM.
3. Understand the PAM, PPM and PWM techniques.
4. Understand the different methods of PCM, PAM, DPCM, DM, ADM schemes which are used in digital communication.
5. Understand the analysis of ASK, FSK, PSK, DPSK, DEPSK, QPSK, MSK and GMSK schemes and comparison of bit error probability.

UNIT – I
AMPLITUDE MODULATION

Generation and demodulation of AM, DSB-SC, SSB-SC, VSB Signals, Filtering of sidebands, Comparison of Amplitude modulation systems, Frequency translation, Frequency Division multiplexing, AM transmitters - Super heterodyne receiver, AM receiver.

UNIT – II
ANGLE MODULATION

Angle modulation, frequency modulation, Narrowband and wideband FM, transmission bandwidth of FM signals, Generation of FM signal - Direct FM - indirect FM, Demodulation of FM signals, FM stereo multiplexing, PLL - Nonlinear model and linear model of PLL, Non-linear effects in FM systems, FM Broadcast receivers, FM stereo receives, Pre-emphasis and de-emphasis in FM, Comparison of performance of AM and FM systems.

UNIT – III
PULSE MODULATION

Time Division Multiplexing, Types of Pulse modulation, PAM (Single polarity, double polarity) PWM-Generation & demodulation of PWM, PPM- Generation and demodulation of PPM

UNIT – IV
PULSE DIGITAL MODULATION

Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error. PAM and Other forms of pulse modulations Differential PCM system (DPCM), TDM, Delta modulation, adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

UNIT – V
MODULATION SCHEMES

Introduction of digital modulation techniques- Generation, Detection, Signal space diagram, calculation of bit error probability and Power spectra of ASK, FSK, PSK, DPSK, DEPSK, QPSK, MSK and GMSK, similarity of BFSK and BPSK, Comparison of Digital modulation systems using bit error probability.

TEXT BOOKS

1. Simon Haykin, Communication Systems, John Wiley & sons, NY, Fifth Edition, 2010.
2. Simon Haykin, "Digital communications", John Wiley, 2013.
3. H. Taub and D. Schilling, "Principles of Communication Systems", TMH, Third Edition, 2008.

REFERENCE BOOKS

1. Roddy and Coolen, Electronic communication, PHI, New Delhi, Fourth Edition, 2003.
2. Bruce Carlson et al, Communication systems, McGraw-Hill Int., Fifth Edition, 2010.
3. Bernard Sklar, "Digital Communication",Paerson Education, Second Edition , 2009.
4. Sam Shanmugam, " Digital and Analog Communication Systems", John Wiley, 2008.

MICROPROCESSOR AND MICROCONTROLLER

3 2 0 3

PRE-REQUISITE:

Basic knowledge of computer, digital electronics

AIM:

To excel in the Architecture of 8086 & 8051 and to develop skill in simple program writing, to study simple applications.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. The Architecture of 8086 & 8051.
2. The addressing modes & instruction set of 8086 & 8051.
3. The need & use of Interrupt structure.
4. Simple program Skills.
5. Commonly used peripheral / interfacing ICs.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Understand the functional block diagram, Timing Diagram, Interrupt structure and Multiprocessor configurations of 8086Microprocessor.
2. Develop the Programming skills using Loop structure with counting & Indexing, Look up table, Subroutine instructions stack.
3. Interface ICs 8255 PPI, 8259 PIC, 8257 DMA, 8251 USART, 8279 Key board display controller and 8253 Timer/ Counter, A/D and D/A converter.
4. Comprehend the Functional block diagram ,Instruction format and addressing modes, Interrupt structure ,I/O Ports and Serial communication of 8051 Microcontroller.
5. Develop the programming skills in PID control algorithm, square, triangular and sine wave form generation, closed loop control of servo motor and stepper motor control.

UNIT – I
INTRODUCTION TO MICROPROCESSOR- 8085

Comparison of microcomputer with "mini" and "large" Computers-Advantages and limitations of Microprocessor based system design -8085 Microprocessor architecture-Addressing modes-Instruction set-Programming the 8085- interrupts – Memory and I/O

UNIT – II
16 BIT MICROPROCESSOR – 8086

Intel 8086 microprocessor - Architecture - Instruction Set-Addressing Modes-- Assembly Language Programming-Procedures- Interrupts.

UNIT – III
MULTIPROCESSOR CONFIGURATIONS

Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration – 8087 Numeric Data Processor – Data Types – Architecture –8089 I/O Processor –Architecture – Communication between CPU and IOP

UNIT – IV
INTERFACING AND SYSTEM DESIGN USING MICRO PROCESSOR

1. 8255-Programmable peripheral Interface along with 8085-Both Mode 0 and Mode 1, detailed study.
2. 8254 - Programmable Interval Timer along with Intel 8086 - Both Mode 0 and Mode 3 to be studied.
3. Need for the following ICs: (a) 8251 - USART; (b) 8257 - Direct Memory Access Controller; (c) 8259-Programmable Interrupt Controller; (d) 8279 - Keyboard / Display Interface
4. Case studies – Traffic light control, washing machine control- Motor Control- Relay, PWM, DC & Stepper Motor

UNIT – V
MICROCONTROLLERS

Architecture of 8051 Microcontroller – signals – I/O ports – memory – counters and timers – serial data I/O – interrupts- Interfacing -keyboard, LCD,ADC & DAC

TEXT BOOKS

1. Ramesh S. Gaonkar ,"Microprocessor – Architecture, Programming and Applications with the 8085" Penram International Publisher , 5th Ed.,2006
2. Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", second edition, Prentice Hall of India , 2006
3. LA Levant Hal, Introduction to Microprocessor, Software, Hardware, Programming, PHI, Inc.1978.
4. Kenneth J.Ayala, 'The 8051 microcontroller 3e, 2004.

REFERENCE BOOKS:

1. Douglas V.Hall, " Microprocessors and Interfacing : Programming and Hardware", second edition , Tata McGraw Hill ,2006.
2. A.K.Ray & K.M Bhurchandi, "Advanced Microprocessor and Peripherals – Architecture, Programming and Interfacing", Tata Mc Graw Hill , 2006.
3. Mohamed Ali Mazidi,Janice Gillispie Mazidi," The 8051 microcontroller and embedded systems using Assembly and C", second edition, Pearson education /Prentice hall of India , 2007.

DESIGN AND ANALYSIS OF ALGORITHMS USING C++

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic knowledge of computer programming.

AIM :

To study various algorithmic techniques and methods of analysis of algorithms

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. To develop proficiency in problem solving and programming.
2. To be able to carry out the Analysis of various algorithms for mainly time and space complexity.
3. To develop a base for advanced study in computer Science

OUTCOME:

After completion of the course the students are expected to be able to:

1. Design algorithms for various computing problems.
2. Analyze the time and space complexity of algorithms.
3. Critically analyze the different algorithm design techniques for a given problem.
4. Modify existing algorithms to improve efficiency.

UNIT – I

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis of Algorithm Efficiency-Analysis Framework – Asymptotic Notations and Basic Efficiency Classes. Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers , Tower of Hanoi

UNIT – II

Divide and conquer: General Method, Binary Search ,Finding the maximum and minimum, Merge sort, Quick sort, Strassen's matrix multiplication

UNIT – III

The Greedy Method : General method, Fractional Knapsack problem, Job sequencing with deadlines, Minimum spanning trees, Single source shortest paths.

UNIT – IV

Dynamic programming: General method, Multistage graphs, All pairs shortest paths, Optimal binary search trees, 0/1 Knapsack, Travelling sales person problem.

UNIT – V

Back Tracking: General method, 8-Queens problem, Sum of subsets, Graph coloring, Hamiltonian cycles – Branch and Bound : General Methods (FIFO & LC) – 0/1 Knapsack problem - NP hard and NP complete Problems-Basic Concepts-Non deterministic Algorithms- The classes NP hard and NP Complete-definitions and examples.

Note : Topics involved in analysis related theorems are not included in the syllabus

TEXT BOOKS

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Education Asia, 2nd Edition 2011 (For Unit I).
2. Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran – "Computer Algorithms/C++, Second Edition, Universities Press, 2007 (For Unit II to V)

REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Sahani, Sanguthevar Rajasekaran – "Fundamentals of Computer Algorithms " – W.H. Freeman and Co. 1996

COMPUTER GRAPHICS

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Programming knowledge in C, Data structures, Basics of linear algebra and matrices.

AIM:

To study about graphics concepts and develop, design and implement two and three dimensional graphical structures and understand about various color model and animation Technique.

OBJECTIVES:

The objective of the course is to impart knowledge on:

To make the students understand graphics concepts and develop, design and implement two and three dimensional graphical structures and understand about various color model and animation Technique.

OUTCOME:

After completion of the course the students are expected to be able to:

1. At the end of subject Students can understand what all are input and output devices are used in graphics system and how to generate line, circle and ellipse also how to create 2D object and various transformation techniques.
2. Students can understand various 3D Transformation techniques and how to create various curves also learn about how to remove hidden surfaces.
3. Students can learn about various color model are used in graphical system and will get knowledge in flash, Photoshop and video editing software.

UNIT – I

Overview of computer graphics: Video Display Devices-Raster Scan System- Random Scan Systems -Input Devices- Computer graphics software. Output Primitives: Points & lines-Line drawing algorithms; DDA algorithm- Bresenham's line algorithm- Circle generation algorithm- Ellipse generating algorithm- scan line polygon- fill algorithm- boundary fill algorithm- flood fill algorithm-Antialiasing.

UNIT – II

2D Concepts-Basic transformations: translation –rotation-scaling - Matrix representations & homogeneous coordinates- transformations between coordinate systems- reflection shear- Transformation of points and lines- parallel lines- intersecting lines. Viewing pipeline- Window to viewport co-ordinate transformation- clipping operations: point clipping, line clipping, clipping circles, polygons clipping- Text Clipping-Exterior Clipping

UNIT – III

3D object representation- 3Dtransformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space - reflection through an arbitrary plane- general parallel projection transformation- clipping - viewport clipping- 3Dviewing.

UNIT – IV

Curve representation- surfaces- designs- Bezier curves - B-spline curves- end conditions for periodic B-spline curves- rational B-spline curves. Hidden surfaces: Depth comparison- Z-buffer algorithm- Back face detection- BSP tree method-the Printer's algorithm- scan-line algorithm; Hidden line elimination- wire frame methods - fractal - geometry.

UNIT – V

Visualization and rendering - color models and applications- Texture mapping - animation – morphing-Introduction to flash, Photoshop and video editing software.

TEXT BOOKS

1. Donald D. Hearn, M. Pauline Baker and Warren Carithers, "Computer Graphics with OpenGL", Fourth Edition, Pearson Education, 2010.
2. Mukherjee Arup, Introduction to Computer Graphics, Vikas

REFERENCES :

1. Foley J.D, Van Dam A, Feiner S.K, Hughes J.F, computer Principles and practice, Addison, Wesley publication company.

SANSKRIT& INDIAN CULTURE

1 0 0 1

(Syllabus for IV Semester)

Unit I – (1) Introduction to Sindh Vedic Cultures; significance & how it is different from the other cultures. (2) Why we have to follow? Important features. (3) Chronology of Indian Cultures; origin & spread; general features.

Unit II – (4) Literary Heritage of India – significance of Indian Literature; (5 & 6) chronology of Indian literature; (7) Literature in Sanskrit and other languages;

Unit III – (8) Early Indian Education – significance & advantages. (9) Gurukulas and Guru-sishya parampara. Learning methods. (10) Evolution of script and languages; important early scripts and writing materials; (11) important early educational centers (*ghattikas,* universities) & their unique features.

Unit IV - (12 & 13) duties & responsibilities of human - *gruhya sutras, smrities* & *sruties* - significance in day to day life.

Unit V - (14 & 15) Scientific thoughts of Early Indian Sages;

REFERENCE BOOKS

1. Joshi,K. 1992(rp). *The Veda and Indian Culture*. Rastriya Veda Vidya Pratishthana. New Delhi.
2. Majumdar, R.C. 1994 (rp). *Ancient India*. Motilal Banarsidas Publishers. Delhi.
3. Patel, I.S. (ed). 1984. *Science and the Vedas*. Bombay.
4. Sri Chandrasekarendra Sarasvati Swamihi. 1991. *The Guru Tradition*. Bharatiya Vidya Bhavan. Bombay.
5. Sri Jayendra Saraswatiji Maharaj. 1951. *The Vedas and Vedangas*. Prakashan Kendra. Lucknow.
6. Vartak, P.V. 1986. *Scientific Knowledge in the Vedas*. Delhi. Winternize, M. 1996(rp). *History of Indian Literature*. Delhi.

SYLLABUS FOR II B.E. SEMESTER III & IV FROM 2014 – 2015 0NWARDS

1 1 0 1

English as a subject is being introduced for second year B.E/B.Tech students from 2014-2015. The objective is to impart intensive teaching to enable them to communicate in English both at the spoken and written levels. The expectations of the campus recruiters and other agencies are taken into consideration.

1. Idioms and Phrasal Verbs (Reference: S. No. 4 Prescribed)
2. Synthesis of Sentences
3. Sentence Completion
4. Paragraph Coherence
5. Same Theme Sentences – Selection of Preferable Sentence
6. Comprehension (True/False, Inference, MCQ)

BOOKS FOR REFERENCE:

1. Objective General English – Dr. R.S. Aggarwal (S.Chand and Co Pvt Ltd, New Delhi 110 055).
2. Essential English – A.P. Bharadwaj (S.Chand and Co Pvt Ltd, New Delhi 110 055).
3. English Grammar and Composition - Wren and Martin
4. English for Engineering Students – Dr. Sumant (VijayNicholas Publication)
   (Relevant portions in the syllabus will be selected from the books prescribed and given in a consolidated form to students.)

ASSESSMENT:

I. Examination for both the Semesters will be through Internal Assessment only. This will be for 100 marks each. A candidate has to secure 50% for a pass.

II. Internal Assessment will comprise of both oral and written examinations for 40 Marks.

III. End Semester Examination is of Practical Mode for 100 marks and this will be converted to 60.

ANALOG AND DIGITAL COMMUNICATION LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PREREQUISITE:
Basic Electronic.

AIM :

To study the various analog communication fundamentals viz., Amplitude modulation and demodulation; Angle modulation and demodulation. To introduce the basic concepts of digital modulation techniques.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. Study the need of modulation, Amplitude Modulation and demodulation
2. Provide various Angle modulation and demodulation
3. Understand different methods of pulse digital modulation and demodulation schemes.
4. Study some basic information theory with some channel coding theorem. Analyze pass band digital modulation and demodulation schemes and compare its bit error probability.

OUTCOME:

After completion of the course the students are expected to be able to

1. Understand the need for modulation and amplitude modulation techniques.
2. Understand frequency modulation, demodulation and the comparison of AM and FM.
3. Understand the PAM, PPM and PWM techniques.
4. Understand the different methods of PCM, PAM, DPCM, DM, ADM schemes which are used in digital communication.
5. Understand the analysis of ASK, FSK, PSK, DPSK, DEPSK, QPSK, MSK and GMSK schemes and comparison of bit error probability.

LIST OF PROGRAMS

1. AM Modulator [Class C Amplifier] / AM Demodulator
2. FM modulator/ FM Detector
3. Pre Emphasis, De emphasis Circuits
4. Study of sampling theorem
5. Pulse amplitude modulation and demodulation(PAM)
6. Pulse width modulation and demodulation(PWM)
7. Pulse code modulation and demodulation(PCM)
8. Pulse position modulation and demodulation(PPM)
9. Time division multiplexing and demultiplexing (TDM)

10. Study of amplitude shift keying system (ASK)
11. Study of frequency shift keying system(FSK)
12. Frequency Counters
13. Frequency Synthesizer using PLL

MICROPROCESSOR AND MICROCONTROLLER LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic knowledge of computer, digital electronics

AIM :

To excel in the Architecture of 8086 & 8051 and to develop skill in simple program writing, to study simple applications.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. The Architecture of 8086 & 8051.
2. The addressing modes & instruction set of 8086 & 8051.
3. The need & use of Interrupt structure.
4. Simple program Skills.
5. Commonly used peripheral / interfacing ICs.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Understand the functional block diagram, Timing Diagram, Interrupt structure and Multiprocessor configurations of 8086Microprocessor.
2. Develop the Programming skills using Loop structure with counting & Indexing, Look up table, Subroutine instructions stack.
3. Interface ICs 8255 PPI, 8259 PIC, 8257 DMA, 8251 USART, 8279 Key board display controller and 8253 Timer/ Counter, A/D and D/A converter.
4. Comprehend the Functional block diagram ,Instruction format and addressing modes, Interrupt structure ,I/O Ports and Serial communication of 8051 Microcontroller.
5. Develop the programming skills in PID control algorithm, square, triangular and sine wave form generation, closed loop control of servo motor and stepper motor control.

LIST OF EXPERIMENTS

EXPERIMENTS IN MICROPROCESSOR 8085:

1) Write a ALP to perform basic arithmetic operation on two 8 bit numbers
2) Write a ALP to find the square of a given number using Look up Table Technique
3) Write a ALP to sort the given array of numbers in Ascending/Descending Order
4) Write a ALP to search for a given number and display the number of occurrences of the given number
5) INTERFACING USING 8085
   a) Study the various modes of 8255 interfaced with 8085 microprocessor

b) Generation of Square, Triangular and Saw tooth waveform using DAC interfaced with 8085 microprocessor

c) Write a ALP to control the speed and direction of Stepper motor

EXPERIMENTS IN MICRPROCESSOR 8086:

1) Write a ALP to perform basic arithmetic operation on two 16 bit Numbers
2) Write a ALP to study the addressing modes in 8086

EXPERIMENTS IN MICROCONTROLLER 8051:

1) Write a microcontroller program to perform basic arithmetic operation on two 8 bit numbers
2) Study and analyze the interfacing of Seven Segment Display with Microcontroller 8051
3) Study and analyze the interfacing of Keyboard with Microcontroller 8051.
4) Study and analyze the interfacing of Traffic Light Control with Microcontroller 8051.
5) Study and analyze the interfacing of 16 x 2 LCD Display with Microcontroller 8051 using Keil µVision.

DESIGN AND ANALYSIS OF ALGORITHMS LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic knowledge of computer programming.

AIM:

To implement various algorithms based on different techniques.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. To implement various problem related to different algorithmic techniques
2. To study the space and time complexity of the implemented algorithms

OUTCOME:

After completion of the course the students are expected to be able to:

1. Implementation of various algorithms and gain the knowledge of problem solving
2. Learn the different techniques used in development of algorithm with examples.

LIST OF PROGRAMS

1. Write a program that implements Tower of Hanoi.
2. Write a program that implements Fibonacci series.
3. Write a program that implements Binary search.
4. Write a program that implements Merge sort
5. Write a program that implements Quick sort
6. Write a program to find the minimum and maximum value using divide and conquer.
7. Write a program that implements knapsack using greedy method
8. Write a program that implements travelling sales person problem.
9. Write a program that implements All pair Shortest path
10. Write a program that implements N-Queen Problem

COMPUTER GRAPHICS LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Programming knowledge in C, Data structures, Basics of linear algebra and matrices.

AIM :

OBJECTIVES:

The objective of the course is to impart knowledge on:

To make the students understand graphics concepts and develop, design and implement two and three dimensional graphical structures.

OUTCOME:

After completion of the course the students are expected to be able to:

1. At the end of subject Students can understand what all are input and output devices are used in graphics system and how to generate line, circle and ellipse also how to create 2D and 3D object and various transformation
2. Students will get knowledge in flash, Photoshop and video editing software.

LIST OF EXPERIMENTS

1. To plot a point (pixel) on the screen.
2. To draw a straight line using DDA Algorithm.
3. To draw a straight line using Bresenham's Algorithm.
4. Implementation of mid-point circle generating Algorithm
5. Implementation of ellipse generating Algorithm.
6. To translate an object with translation parameters in X and Y directions.
7. To scale an object with scaling factors along X and Y directions.
8. To rotate an object with a certain angle about origin.
9. Perform the rotation of an object with certain angle about an arbitrary point.
10. To perform composite transformations of an object.
11. To perform the reflection of an object about major axis.
12. To Creating Animation using Flash.

V SEMESTER

MAUFT1261 – AUTOMATA THEORY AND APPLICATION

3 2 0 3

(For students admitted from 2012-13)

PRE-REQUISITE:

Basic knowledge of Mathematics, Set theory, Mathematical induction principles.

AIM:

To design compiler designer, digital circuits, software programming`

OBJECTIVES:

The objective of the course is to impart knowledge on
Programming simple software, to design Lexical analyzer. Unix. etc.,

OUTCOME:

After completion of the subject the students are expected to be able to

1. Design of digital circuits.
2. Design of Lexical analyzer
3. Designing software for identifying the words, phrases and other patterns in large bodies of text.
4. To write software for processing the natural language.
5. To apply in Artificial Intelligence and knowledge engineering, in game theory and games, computer graphics, linguistics etc.,

UNIT – I
FINITE AUTOMATA

An informal picture of finite automata - Deterministic finite automata – Non-deterministic finite automata – An application: Text search – Finite automata with epsilon transitions

UNIT II
REGULAR EXPRESSIONS AND LANGUAGES

Regular expressions – Finite automata and regular expressions – Applications of regular expressions: Regular expressions in UNIX, Lexical analysis, Finding patterns in a text – Algebraic laws for regular expressions

UNIT III
CONTEXT FREE GRAMMARS AND LANGUAGES

Context free grammars – Parse trees – Applications of context free grammars: Parsers, The YACC parser generator, Markup languages, XML and document type definitions – Ambiguity in grammars and languages.

UNIT IV
PUSHDOWN AUTOMATA

Pushdown automaton – The languages of a Pushdown automaton – Equivalence of Pushdown automaton and Context free grammars – Deterministic pushdown automata.

UNIT V
INTRODUCTION TO TURING MACHINES

Problems that computers cannot solve – The Turing machine – Programming techniques for Turing machines – Extensions to the basic Turing machine – Restricted Turing machines – Turing machines and computers

Note: The second edition of the prescribed text book differs drastically in treatment (Application oriented) from the first edition (Theory oriented). Hence the treatment of the second edition is to be followed. Questions are to be set on problem solving and not on the theoretical aspects.

TEXT BOOK

1. Hopcroft E.John, Motwani Rajeev, Ullman D. Jeffrey, Introduction to Automata theory, Languages and Computation, Second Edition, Pearson Education 2001

REFERENCE BOOKS

1. Anderson, A.James, Automata theory with modern applications, Cambridge
2. Carlos Martín-Vide, Victor Mitrana, Grammars and Automata for String Processing,Taylor & Francis
3. Linz Peter, An introduction to formal languages and automata, Narosa Publishing House, New Delhi

DATABASE MANAGEMENT SYSTEM

3 2 0 3

(Common to the branches CSE/IT)
(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Fundamentals of Computer

AIM :

Most of the organizations depend on databases for storing the data and to share the data among different kinds of users for their business operations. Persistent storage required and several users must be able to safely access the same data concurrently. Hence this course discusses about the problems with the file processing system and how it can be handled effectively in Database Systems through various design tools, design techniques and algorithms.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. To understand the different database models and language queries to access databases.
2. To understand the normalization forms in building an effective database tables
3. To protect the data and the database from unauthorized access and manipulation

OUTCOMES:

After completion of the course the students are expected to be able to:

1. Ability to define, manipulate, and control a relational database management system
2. Ability to design SQL based Client-Server applications
3. Ability to build a database management system that satisfies relational theory

UNIT – I

Databases - Need - Concepts - Architecture - Data independence - Data modeling: Entity relationship model - Weak entity sets - Mapping ER model to Relational model.

UNIT – II

Concepts - Integrity constraints - Relational algebra - Relational calculus - Tuple relational calculus - Domain relational calculus - Overview of QBE.

UNIT – III

SQL Queries - Nested queries - Aggregate operators - Null values - Embedded SQL – Database security - Views - Queries on views.

UNIT – IV

Schema Refinement - Functional dependencies - Normalization - Decomposition - Armstrong's axioms - 3NF, BCNF, 4NF - Multi-valued dependencies.

UNIT – V

Object-oriented data model - Object identity and pointers - Object definition and manipulation language - Object-oriented databases - Object relational databases - Recent trends.

TEXT BOOK

A. Silberchatz, F. Korth, and S. Sudarshan, "Database System Concepts", Fourth Edition, McGraw Hill, 2002.

REFERENCE BOOK

R. Elmasri and S. B. Navathe, "Fundamentals of Database Systems", Third Edition, Pearson Education, 2000

OPERATING SYSTEMS

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic Knowledge about Processors, Synchronization, Memory Management

AIM:

To learn about various aspects of operating systems such as process management, memory management and I/O management

OBJECTIVE:

The objective of the course is to impart knowledge on:

The objective of this subject is to help the students to get detailed Knowledge of the various functions which are being performed by the operating system.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Students can learn about various techniques and algorithms
2. Students learn more about operating systems and its functional performance
3. Students are able to know about the process of segmentation

UNIT I

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection – System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

UNIT II

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware– Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III

System Model – Deadlock Characterization – Methods for handling Deadlocks-Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and GregGagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

REFERENCE BOOK

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002
2. Andrew S. Tanenbaum, “Modern Operating Systems”,Prentice Hall of India Pvt. Ltd, 2003
3. William Stallings, “Operating System”, Prentice Hall of India, 4thEdition, 2003
4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003

JAVA PROGRAMMING

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic knowledge of C++ programming.

AIM:

The aims of the course are to develop experience in the *Java* language and its object-oriented features by the use of hands-on exercises to create both applications and applets. It will enable the students to understand the core principles of the Java Language.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. To understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
2. To identify classes, objects, members of a class and the relationships among them needed for a specific problem.
3. To create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling)
4. To use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing.
5. To develop programs using the Java Collection API as well as the Java standard class library.

OUTCOMES:

After completion of the course the students are expected to be able to:

1. Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and iterative structures, and functions.
2. Describe and use the mechanics of parameter passing.
3. Discuss and use primitive data types and User defined data types.
4. Build applications using Java's object-oriented features.
5. Create applications and applets using Java class libraries
6. Student will be able to develop applications in Java.

UNIT I

Introduction to Java: Fundamentals of OOPS-Java Evolution, Java Vs C++-JVM-Java Tokens-Constants, Data Types & Variables, Operators and Expressions-String Handling: String Basics, String Operations, Character Extraction, String Buffer, Arrays, Classes, objects and Methods, Final, Static-Exploring java.io: Buffered InputStream & Buffered OutputStream-Modifiers-Inheritance.

UNIT II

Interfaces: Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interfaces-Packages: Creating and Accessing Packages, Mechanisms of Using Packages, Hiding Classes, Import command- Exception Handling. : Types of Errors, Exceptions, Exception Handling Mechanisms, Advantages, Throwing User defined Exceptions

UNIT III

Multithread Programming: Fundamental Concepts, Thread Creations, Thread Life Cycle, Thread Priorities and Thread Scheduling, Thread Synchronization, InterThread Communication-Managing I/O Files: Concepts of I/O Streams, Stream classes, character Streams, Byte Streams, File Streams, random Access Files, and Serializations-Exploring java.net: InetAddress, Server Socket, socket, Datagram Packet, Datagram Socket, and Multicast Socket.

UNIT IV

Exploring java.Util: collections, Enumerations, iterations, String Tokenizer, Bitset, Date, Calendar, Gregorian Calendar, Time Zone, Currency-Applet Programming: Applet Fundamentals-Java Application Vs Java Applets, Applet life Cycle, Building the Applet code, Running the Applet-Passing Parameters to Applet, Applet tag, Java Applet Package.

UNIT V

Exploring javax.swing: Jcomponent, containers, panes, Layout Managers, Basic Components, Advanced Components-Handling Events: Listener, Interfaces and Adapter classed for various components-JDBC principles: Exploring java.sql-connection, DriverManager, Statement, Resultset, Callable statement, prepared Statement, Resultset Metadata & Database Meta Data.

TEXT BOOKS:

1. Herbert Schildt, “Java 2-The Complete Reference”, Fifth Edition, Tata McGraw Hill, 2002.
2. James Jaworski, “Java Unleashed”, SAMS Techmedia Publications, 4th revised edition,1998.

REFERENCE BOOKS:

1. Java Blackbook, Kogent Publications
2. Campione, Walrath and Huml, “The Java Tutorial”, Addison Wesley.
3. Java Network Programming, Second Edition, O’Reilly, (for Java.net package in Unit III)
4. Java Database Programming Bible, John O’ Donahue (for Unit V)

INDIAN CULTURE

1 0 0 1

(Syllabus for V Semester)

Unit I – (2) Samskaras or Sacraments – Important occasions & significance; Sixteen important Samskaras in due course of human life.

Unit II – (1) Responsibilities of Human - four Ashrama Dharmas .

Unit III – (2) significance of social gatherings & celebrations of different occasions. – Worship – personal and public rituals & their significance; (2) soi-cultural significance of festivals and impact on culture. (1) Significance of sound science – *Gandharvaveda* (Music) & Dance.

Unit IV – (2) Significance of Yoga in daily life.

Unit V – (2) Scientific heritage - importance and significance of Upavedas. (3) Special reference to Ayurveda and Arthasastra.

REFERENCE BOOKS

1. Acharya, D. 1999. *Dharnuveda* (sub-Veda of Yajurveda). Hindi. Vijaya Kumar Govindram Harsanand. Delhi.
2. Kangle, R.P. 1992 (rp). *The Kautilya Arthasastra.* Delhi.
3. Rao, S.K.R. 1994. *Nityarchana*. Agama-kosha (Agam Encyclopaedia). Kalpatharu Research Academy Publications. Vol X. Banglore.
4. Ray, P. (tr). 1997. *Vasistha's Dhanurveda Samhita*. J.J. Publishing House. Delhi.
5. Shalini, K. 1997. *Vedic Leguminous Plants* (Medical and Microbiological Study). Classical Publishing Company. New Delhi.
6. Swami Satyananda Saraswati. 1997 (rp). *Asanas Pranayama Mudra Bandha*. Bihar Yoga Bharati. Bihar.

HR Skills – III

1 1 0 1

(For Students admitted from 2014 onwards)

PRE-REQUISITE :
Basic knowledge in Mathematics and Reasoning.

AIM:
To succeed in campus recruitment and other career development examinations.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. To improve candidate does abilities and verbal understand.
2. To improve numerical skills and diagrammatic reasoning skills.
3. To help to determine the correct sequence of a set of sentences.
4. Totrain the students to identify from a number of pieces of information, those that are needed to solve a problem.
5. To cater to the needs to attend competitive examinations in a successful manner.

OUTCOMES:

After completion of the course the students are expected to be able to:

1. The students will be able to solve the problems with verbal understanding
2. Will acquire the skill of doing numerical skills and diagrammatic reasoning problems.
3. Will acquire the ability to determine the correct sequence of a set of sentences.
4. Can do the problems within the time-frame.
5. Will be able to attend competitive examinations in a successful manner.

UNIT-I
(NUMBERS AND NUMBER SYSTEMS, EQUATIONS, RATIO-PROPORTION-VARIATION)

Addition-Subtraction-Multiplication-Division-Prime Numbers and Composite Numbers-LCM,HCF-Equations-Variation.

UNIT-II
(PERCENTAGES-PROFIT AND LOSS-PARTNERSHIP,AVERAGES-MIXTURES-ALLIGATIONS AND SIMPLE INTEREST-COMPOUND INTEREST)

Percentage-Partnerships-Average , Mixtures-Alligation, Interest.

UNIT –III
(QUADRATIC EQUATIONS AND PROGRESSIONS,TIME AND WORK-PIPES AND CISTERNS,TIME AND DISTANCE)

Quadratic Equations-Arithmetic progression-Geometric Progression- Time and Work-Pipes and cisterns. Speed.

UNIT-IV
(GEOMETRY-MENSURATION,PERMUTATIONS&COMBINATIONS)

Angles and lines, Arcs and sectors, Mensuration, Permutations, Combinations.

UNIT-V
(PROBABILITY,DATA INTERPRETATION,DATA SUFFICIENCY)

Compound events, Independent events, Methods of Presenting data, Three –dimensional graph, Flow chart.

REFERENCES:

1. Quantitative Aptitute, R.S.Aggarwal, S.Chand&Company Pvt.Ltd.,New Delhi.
2. Quantitative Aptitude for competitive examinations, Abhijit Guha, Tata McGraw-Hill Education Pvt.Ltd., New Delhi.

DATABASE MANAGEMENT SYSTEMS LABORATORY

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic knowledge about database concepts.

AIM :

Most of the organizations depend on databases for storing the data and to share the data among different kinds of users for their business operations. Persistent storage required and several users must be able to safely access the same data concurrently. Hence this course discusses about the problems with the file processing system and how it can be handled effectively in Database Systems through various design tools, design techniques and algorithms.

OBJECTIVES:

The objective of the course is to impart knowledge on:

1. Learn to create and use a database
2. Be familiarized with a query language
3. Have hands on experience on DDL Commands
4. Have a good understanding of DML Commands and DCL commands
5. Familiarize advanced SQL queries.
6. Be Exposed to different applications

OUTCOMES:

After completion of the course the students are expected to be able to:

1. Design and implement a database schema for a given problem-domain
2. Populate and query a database
3. Create and maintain tables using PL/SQL.
4. Prepare reports.

LIST OF EXPERIMENTS

1. Creation of a database and writing SQL queries to retrieve information from the database.
2. Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based on conditions. Creation of Views, Synonyms, Sequence, Indexes, Save point.
3. Creating an Employee database to set various constraints.
4. Creating relationship between the databases.
5. Study of PL/SQL block.
6. Write a PL/SQL block to satisfy some conditions by accepting input from the user.
7. Write a PL/SQL block that handles all types of exceptions.
8. Creation of Procedures.

9. Creation of database triggers and functions
10. Mini project (Application Development using Oracle/ Mysql)
    a) Inventory Control System.
    b) Material Requirement Processing.
    c) Hospital Management System.
    d) Railway Reservation System.
    e) Personal Information System.
    f) Web Based User Identification System.
    g) Timetable Management System.
    h) Hotel Management System

REFERENCE:

1. www.Spoken-Tutorial.org

OPERATING SYSTEMS LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PREREQUISITE:

Basic Knowledge about Unix and Linux Commands, CPU Scheduling, Process Management and Deadlocks.

AIM:

To learn about various aspects of operating system functionalities with various system calls related to file system and process management.

OBJECTIVES:

The objective of the course is to impart knowledge on:

The objective of this lab is to teach students about various operating systems including Unix and Linux, Shell Programming and System Calls.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Students will learn various scheduling algorithmic techniques
2. Process Synchronization used by operating systems to perform its functionalities

LIST OF EXPERIMENTS

1. Basic UNIX commands.
2. Shell Programming.
3. Illustration of Grep, sed, awk .
4. File system related system calls.
5. Process management – Fork, Exec.
6. Implement CPU Scheduling using
   (i) FIFOs.
   (ii) Round Robin.
7. Process synchronization using semaphores (Solutions to synchronization
   (i) problems like producer consumer problem, dining philosophers' problem
   (ii) etc...)
8. Bankers Algorithm.

JAVA PROGRAMMING LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic knowledge of C++ programming.

AIM :

To enable the students to understand the core principles of the Java Language and to produce well designed, effective applications and applets.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. To introduce the students to some concepts of advanced programming and practice on reusing components.
2. To focuses on Graphical User Interface (GUI), multithreading, networking, and database manipulation.
3. To develop applet programs and swing concepts.
4. To design packages, interfaces and implement the concepts of inheritance.
5. To create back end connectivity with java programs.

OUTCOME:

After completion of the course the students are expected to be able to:

1. Student will be able to develop applications in Java.
2. Students will able to use java libraries.
3. Students will create packages and develop interfaces.
4. Student will be able to develop Applets and swing concepts of programs.

LIST OF PROGRAMS

1. Simple Java Applications
    a. For understanding reference to an instance of a Class(object), methods
    b. Handling Arrays, Control statements and operators.
    c. Handling Strings in java.
2. Package Creation
    a. Developing User defined packages in java
3. Interface
    a. Developing user-defined interfaces and implementation.
    b. Use of predefined Interfaces.
4. Inheritance
    a. Handling inheritance in java\

5. Threading
    a. Creation of thread in java applications.
    b. Multithreading
6. Exception Handling Mechanisms
    a. Handling pre-defined exceptions
    b. Handling user-defined exceptions
7. File operations in java
8. Applets
    a. Handling simple applet programs.
    b. Creation of color Palette.
9. Swings
    a. Handling Layouts in java
    b. Handling Events in javax.swing
    c. Handling swing controls.
10. Database connectivity
    a. Handling backend connectivity for data retrieval

VI SEMESTER

PRINCIPLES OF COMPILER DESIGN

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITES:

An undergraduate course in automata theory, design and analysis of algorithms and data structures.

AIM :

At the end of the course the student will be able to design and implement a simple compiler.

OBJECTIVES:

The objectives of the course to impart knowledge on:

1. To introduce the major concept areas of language translation and compiler design.
2. To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table.
3. To extend the knowledge of parser by parsing LL parser and LR parser.

OUTCOME :

After completion of the course the students are expected to able to

1. To acquire the knowledge of modern compiler & its features.
2. To learn & use the new tools and technologies used for designing a compiler

UNIT – I
INTRODUCTION TO COMPILING

Compilers Analysis of the source program –Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis –Role of Lexical Analyzer – Input Buffering –Specification of Tokens-Finite Automata-Regular expression to finite Automata- Minimization of NFA to DFA.

UNIT – II
SYNTAX ANALYSIS

Role of the parser –Writing Grammars –Context Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser –Canonical LR Parser – LALR Parser

UNIT – III
INTERMEDIATE CODE GENERATION

Syntax directed translation -Intermediate code generation- Postfix notation, Three address codes-quadruples, triples and indirect triples –Syntax trees-Declarations –Assignment Statements –Boolean Expressions –Flow of control statements– Case Statements – Back patching – Procedure calls.

UNIT – IV
CODE GENERATION

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT – V
CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS

Introduction – Principal Sources of Optimization –Loop optimization- Optimization of basic Blocks – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TEXT BOOKS

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools",Pearson Education Asia, 2003.
2. Raghavan V, "Principles of Compiler Design", Tata Mc-Graw Hill Education Pvt. Ltd., New Delhi, 2009

REFERENCE BOOKS

1. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings,2003.
3. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003

COMPUTER NETWORKS

3 2 0 3

(For students admitted from 2014 onwards)

PRE-REQUISITE :

Linux in C- Programming Knowledge to understand the protocol implementations of OSI and TCP/IP Network Models

AIM :

To gain basic and core knowledge in Networking Hardware and Software and OSI and TCP/IP models with their corresponding Layers, Issues , Functionalities and Protocol Design.

OBJECTIVES :

The Objective of this Course is to impart knowledge on :

1. Networking fundaments
2. How Data communication happens in different networks.
3. Working principle of Internet.
4. OSI and TCP/IP Layers and protocols Design
5. Application software Development to implement various protocols.

OUTCOME :

After completion of the course the students are expected to be able to:

1. Understand the basic network concepts, topologies and models.
2. Appreciate the Design and functioning of OSI and TCP/IP Models.
3. Understand the issues and solutions offered in each Layer of above-said models.
4. Understand the working principle of Internet and Domain Name System(Internet Addressing)

UNIT – I

Introduction : Network Hardware, Network Software, Reference Models, Example Networks, Network Standardization.

UNIT – II

Physical Layer : The Theoretical basis for Data Communication, Digital Signals, Transmission Impairment, Data Rate Limits, Performance Guided Transmission media. The Mobile Telephone System.

UNIT – III

The Data Link Layer : Data Link Layer Issues, Error Detection and Correction, Elementary Data Link Layer protocols, Sliding Window Protocols, Example Data Link protocols.

MAC Sub-Layer :The Channel Allocation Problem, Multiple Access Protocols , Ethernet-Wireless LANs – Data Link Layer Switching.

UNIT – IV

Network Layer : Design Issues, Routing Algorithms, -Congestion Control Algorithm, Inter-Networking. The network Layer in the Internet. IPV4 and IPV6 Logical Addressing

The Transport Layer : The Transport Service, Elements of transport protocols, A Simple Transport protocol, The Internet transport protocols : UDP and TCP. Performance Issues.

UNIT – V

Session Layer : Session Layer Design Issues, Remote Procedure Calls.

Presentation Layer : Design Issues- Data Compression Techniques,

The Application Layer : DNS- Domain Name System , Electronic mail – File Transfer, SSH .

Basic Introduction to Wireless Networks, Software Defined Networks, Wireless Sensor Networks**.**

TEXT BOOKS

1. **Computer Networks**, Fourth Edition, Andrew S. Tanenbaum.
2. **Data Communications and Networking**, Fourth Edition, Bhrouz A Forouzan.(covers following topics)
   (Unit 2 – Digital Signals, Transmission Impairment, Data Rate Limits)
   (Unit 4 – IPV4 and IPV6 Logical Addressing)
   (Unit 5 – Session Layer and Presentation Layer)

REFERENCE BOOKS

1. **Data Communications and Computer networks**, Gupta & Prakash .C , Prentice Hall of India, New Delhi, 2009.
2. **Computer Networks** , BAGAD V.S. & Dhotre I.A. Technical Publications , Pune , 2012.

MOBILE COMPUTING

3 2 0 3

(For students admitted from 2014 onwards)

PRE-REQUISITE:

A background in computer networks is required. Familiarity with network simulation tools would be an advantage

AIM

To gain basic and core knowledge in Mobile communication and Software application.

OBJECTIVES:

The Objective of this Course is to impart knowledge on :

1. To learn about the concepts and principles of mobile computing
2. To explore both theoretical and practical issues of mobile computing
3. To develop skills of finding solutions, developing and simulating various mobile applications

OUTCOME:

After completion of the course the students are expected to be able to:

1. To understand the concepts of wireless communication and transmission
2. To recognize the various multiple access mechanisms
3. To understand the different types of routing protocols that support wireless environment
4. To adapt with multidisciplinary activities mobile database, mobile cloud and sensor networks

UNIT – I
WIRELESS COMMUNICATION FUNDAMENTALS

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT – II
TELECOMMUNICATION NETWORKS

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT – III
WIRLESS LAN

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth, Wireless ATM- Architecture.

UNIT – IV
MOBILE NETWORK LAYER & TRANSPORT AND APPLICATION LAYERS

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics, Traditional TCP – Classical TCP improvements.

UNIT – V
MOBILE APPLICATION LAYER & CASE STUDIES

WAP, WAP 2.0, Mobile Database, Mobile Cloud and Sensor Networks.

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition, 2003. (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8- Unit V Chap 9&10.)
2. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 1st Indian reprint 2002. (Unit I Chapter – 7&10-Unit II Chap 9)

REFERENCE BOOKS

1. Kaveh Pahlavan, P Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.
3. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.
4. Vijay Kumar, "Mobile Database Systems", Wiley Series on Parallel and Distributed Computing, 2006.
5. https://cloud.google.com/solutions/mobile
6. www.sensor-networks.org/

SANSKRIT & INDIAN CULTURE

1 0 0 1

(Syllabus for VI Semester)

Unit I – (2) Social significance of religion - evolution of religious thoughts and ritual practices; (1) different philosophical Schools.

Unit II – (1) structural evolution for ritual practices; significance of temples & other constructions. (2) Civil engineering skill & construction technologies; scientific aspects in *Vastusastra*

Unit III – (1) Important personalities and their Contribution – Devarishies, Maharishies, Rishies, Seers and contribution of their institutions to protect the cultural heritage.

Unit IV – (3) Vedic Mathematics, Astrology & Astronomy, etc. early Indian works and its importance in day to day life.

Unit V – (5) project work - ancient Indian technological thoughts with modern applications in different fields.

REFERENCE BOOKS

1. Datta, B. & A.N. Singh. 1962(rp). *History of Hindu Mathematics.* 2 Vols. Asian Publishing House. Bombay.
2. Jagadguru Swami Sri Bharati Krishna Tirthaji Maharaj. 1994 *Vedic Mathematics*. Motilal Banarasidas. New Delhi.
3. Kulkarni, R.P. 1983. *Geometry according to Sulba Sutra*. Samsodhana Mandal. Pune.
4. Radhakrishna, S. 1993(rp). *Indian Philosophy*. Vol I & II. Oxford University Press. Delhi.
5. Rao, J. 1960. *Principles and Practices of Medical Astrology*. Raman Publications. Banglore.

HR Skills – IV

1 0 0 1

APTITUTE SKILLS-II

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic knowledge in Mathematics and Reasoning.

AIM :

To succeed in campus recruitment and other career development examinations.

OBJECTIVES :

The objective of the course is to impart knowledge on:

1. To improve candidate does abilities and verbal understand.
2. To improve numerical skills and diagrammatic reasoning skills.
3. To help to determine the correct sequence of a set of sentences.
4. Totrain the students to identify from a number of pieces of information, those that are needed to solve a problem.
5. To cater to the needs to attend competitive examinations in a successful manner.

OUTCOMES:

After completion of the course the students are expected to be able to:

1. The students will be able to solve the problems with verbal understanding
2. Will acquire the skill of doing numerical skills and diagrammatic reasoning problems.
3. Will acquire the ability to determine the correct sequence of a set of sentences.
4. Can do the problems within the time-frame.
5. Will be able to attend competitive examinations in a successful manner.

UNIT-I
(NUMBERS AND LETTER SERIES - ANALOGIES)

Number series –Difference series – Product series – Squares/ cube series – combination series – General approach to number series. Letter series – Number and Letter analogies.

UNIT-II
(CODING AND DECODING – BLOOD RELATION)

Coding and Decoding – Odd man out – Alphabet classification – Word classification – Number classification. Blood Relation.

UNIT –III
(DIRECTIONAL SENSE – SYMBOLS AND NOTATION - DEDUCTION)

Directional sense - Symbols and Notation – Blood relation – Mathematical operations – Deduction – Rules of deduction – Example (I to X)

UNIT-IV
(CONNECTIVITY'S – CLOCK AND CALENDARS – ANALYTICAL REASON)

Connectivity's – Logical Connectivity's – OR, NOT, AND, IF-THEN. Clock – Points to note. Calendars –Leap& non Leap year – Counting number of odd days - Analytical reason – Linear sequencing – Circular arrangements – Order sequence.

UNIT-V
(DISTRIBUTION – BINARY LOGIC & PUZZLES – CUBES & VENN DIAGRAMS – NON-VERBAL REASONING)

Distribution – Double line distribution – Binary logic - Puzzle. Cubes – Venn diagram Type I, II, III – Non-Verbal reasoning – Patterns of behavior elements – Types of questions

REFERENCES:

1. Quantitative Aptitute, R.S.Aggarwal, S.Chand & Company Pvt. Ltd., New Delhi.
2. Quantitative Aptitute for competitive examinations, Abhijit Guha, Tata McGraw-Hill Education Pvt. Ltd., New Delhi.

PRINCIPLES OF COMPILER DESIGN LAB

0 0 3 2

(For students admitted from 2014 onwards)

PRE-REQUISITE :

An undergraduate course in automata theory and good knowledge in programming.

AIM:

At the end of the course the student will be able to design and implement code for each phase to understand compiler software working and its coding in detail.

OBJECTIVES:

The objectives of the course to impart knowledge on:

1. To provide an Understanding of the language translation peculiarities by designing complete translator for mini language.
2. To provide practical programming skills necessary for constructing a compiler.

OUTCOME :

After completion of the course the students are expected to be able to:

1. Technical expertise to design, develop and implement a compiler for any language.
2. To apply the knowledge of lex tool & yacc tool to develop a scanner & parser.
3. To design & conduct experiments for Intermediate Code Generation in compiler.
4. To design & implement a software system for backend of the compiler.
5. To learn the new code optimization techniques to improve the performance of a program in terms of speed & space.

LIST OF EXPERIMENTS:

1. Generation of tokens for given lexeme
2. Implementation of symbol table
3. Check whether the given string is successfully parsed or not
4. Computation of FIRST and FOLLOW sets
5. Computation of LEADING and TRAILING sets
6. Implementation of shift reduce parser
7. Implementation of Quadruples and triples
8. To implement the lexical analyzer using LEX tool for a subset of C language.
9. To write LEX and YACC program for implementing calculator using LEX and YACC tool.
10. To write LEX and YACC program for implementation of syntax analyzer using LEX and YACC tool.

COMPUTER NETWORKS AND DATA COMMUNICATION LAB

0 0 3 2

(For students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Linux & Networking Linux Commands and Linux in C & C++ /Java- Programming Skills.

AIM :

To gain basic and core knowledge in Networking Software Development for OSI and TCP/IP models with their corresponding Layers, Issues , Functionalities and Protocol Design.

OBJECTIVES:

The Object ive of this Course is to impart knowledge on :

1. Introduction to Socket Programming
2. To develop TCP/UDP Socket connection application to realize Client- Server Model
3. Application software Development to implement various Application Layer and network Layer routing Algorithms**.**
4. Remote Command Execution and Remote Method Invocation.
5. Use of LAN Trainer Kit to understand Network topologies and Operations

OUTCOME:

After completion of the course the students are expected to be able to:

1. Understand the basic network concepts, topologies and OSI and TCP/IP models.
2. Appreciate the Design and functioning of OSI and TCP/IP Models.
3. Understand the issues and solutions offered in terms of protocol implementation in each Layer of above-said models.
4. Understand the working principle of Internet.

LIST OF EXPERIMENTS

1. Study of Network Topologies, Devices .
2. Write a program to simulate Sliding window protocol.
3. Write a program to simulate shortest path algorithm.
4. Write a program to simulate Distance vector Routing algorithm.
5. Write a program to know your IP Address and to check whether it is Broadcasting address or not.
6. Write a program to establish a TCP Socket connection between 2 system and communicate "Hello" message.
7. Design a Broadcasting server to send "hello" message to 5 other clients.
8. Design a searching tool to check for the availability of a file in server.
9. Design FTP to download a given file from another system using TCP Sockets.

10. Design a simple chat application for communicating between 2 systems using swing components and DatagramSockets.
11. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
    a) Shortest path routing
    b) Flooding
    c) Flow based routing
    d) Distance vector
    e) Link State
    f) Hierarchical
    g) Broadcast /Multicast routing
12. Getting the MAC Address
13. HTTP Download
14. Remote Command Execution
15. Remote Method Invocation .
16. Study and Implementation of Experiments using LAN Trainer Kit
    i. Aloha
    ii. CSMA
    iii. CSMA/CD
    iv. Token Bus
    v. Token Ring
    vi. Stop and Wait
    vii. Stop and Wait with BER
    viii. Sliding Window Go Back N
    ix. Sliding Window Go Back N with BER
    x. Packet Transmission
    xi. File Transfer
17. Campus Network – Design and Implementation
18. Network tool Introduction – Packet Tracer, NS2, RF Planner

(**Not for Evaluation**)

- **Ref** : BenchMark LAN Trainer User Manual by Prof. Timothy A. Gonsalves, Department of Computer Science & Engineering, IIT-Madras.
- **Ref** : http://192.168.0.201/netlab1/Ens466_Experiments%20 available in Lab-2.

MOBILE COMPUTING LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

A background in computer networks is required. Familiarity with network simulation tools would be an advantage

OBJECTIVES:

The Objective of this Course is to impart knowledge on :

1. To learn about the concepts and principles of mobile computing
2. To explore both theoretical and practical issues of mobile computing
3. To develop skills of finding solutions, developing and simulating various mobile applications

OUTCOME:

After completion of the course the students are expected to be able to:

1. To understand the concepts of wireless communication and transmission
2. To recognize the various multiple access mechanisms
3. To understand the different types of routing protocols that support wireless environment
4. To adapt with multidisciplinary activities mobile database, mobile cloud and sensor networks

Simulate the following programs using Sun java toolkit

1. Write program to simulate HelloWorld midlet
2. Write program to simulate multiple midlets
3. Write program to simulate command class
4. Write program to implement check color
5. Write a program to create menu events
6. Create a MIDP application, which draws a bargraph to display. Data values can be given integer
7. Simulate the following programs using NS-2
    a) AODV Protocol
    b) DSR Protocol
    c) TCP/IP Protocol

WEB TECHNOLOGY LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Needs basic computer knowledge and working with Microsoft Office

AIM:

To create a fully functional website with MVC Architecture

OBJECTIVE:

The Objective of this Course is to impart knowledge on :

1. The objective of this web technology lab is to develop an ability with students to design and implement static and dynamic website.
2. Study about Basic HTML Tags with help of CSS Styling and client side Event handling using VB Script & java Script
3. Web Technology Lab is a part of Server side programming like ASP, Servlet, JSP and PHP Technologies.
4. Finally study about Cookies, Sessions and Database Handling with ASP, Servlet, JSP and PHP Technologies

OUTCOME:

After completion of the course the students are expected to be able to:

To be a good web designing and web programming ability and Model–view–controller has been widely adopted as architecture for World Wide Web applications in major programming languages. Several commercial and noncommercial web application frameworks have been created that enforce the pattern. These frameworks vary in their interpretations, mainly in the way that the MVC responsibilities are divided between the client and server.

LIST OF EXERCISES

Using Web Designing IDE's Like Dreamweaver, Front page, Expression Web, Share point to design following excise 1 to excise 5

1. Create a simple webpage using HTML.
2. Use frames to Include Images and Videos.
3. Add a Cascading Style sheet for designing the web page.
4. Design a dynamic web page with validation using JavaScript.
5. Course registration using ASP & Sql server (use cookies, sessions to be part of excises)

Using Eclipse (PHP & J2EE) IDE to implement following excise 6 to excise 8

6. Any Online Application using Servlet & Sql server (use cookies, sessions to be part of excises)
7. Any Online Application using JSP & Sql server (use cookies, sessions to be part of excises)
8. Library Automation using PHP & Sql server (use cookies, sessions to be part of excises)

VII SEMESTER

EBU7FT091– RESOURCE MANAGEMENT TECHNIQUES

3 1 0 3

(For computer science engineering students admitted from 2012-13)

PRE-REQUISITE :

Understanding of Programming, Sequencing, Graphs, State Machines, Algorithms

AIM:

To introduce the student's foundational aspects of Mathematical Programming in Resource management techniques.

OBJECTIVES:

The Objective of this Course is to impart knowledge on :

1. To introduce the Mathematical formulation of the problem to be serving as tools in the development of theoretical computer science.
2. To focus on Transportation and assignment model in computer engineers to solve problems occurred in the development of programming languages.
3. To know about the importance of Game theory in computer science & engineering.
4. To know the methods to solve replacement and sequencing problems in computer engineers.
5. To Solve problems in Resource allocation Scheduling.

OUTCOME:

After completion of the course the students are expected to be able to,

1. Have the knowledge of the Mathematical formulation of the problem which is a tools in the development of theoretical computer science.
2. Capable to solve the problems on Transportation and assignment model in computer engineers.
3. Have the knowledge of Game theory in computer science & engineering.
4. Able to solve replacement and sequencing problems in computer engineers.
5. Have the knowledge to Solve problems in Resource allocation Scheduling.

UNIT – I
LINEAR PROGRAMMING AND SIMPLEX METHOD

Mathematical formulation of the problem - Graphical solution method - Exceptional cases - General linear programming problem - Canonical and standard forms of linear programming problem - The simplex method - Computational procedure : The simplex algorithm - Artificial variable techniques : Big M method - problem of degeneracy.

UNIT – II
TRANSPORTATION, ASSIGNMENT AND ROUTING PROBLEMS

Mathematical formulation of the transportation problem - Triangular basis - Loops in a transportation table - Finding initial basic feasible solution (NWC, LCM and VAM methods) -

Moving towards optimality - Degeneracy in transportation problems- Transportation algorithm (MODI method) - Unbalanced transportation problems - Assignment algorithm : Hungarian assignment method - Routing problems : Travelling salesman problem.

UNIT – III
GAME THEORY

Two person zero sum games - Maxim in Minimax principle - Games without saddle points (Mixed strategies) - Solution of 2 X 2 rectangular games - Graphical method - Dominance property - Algebraic method for m x n games - Matrix oddments method for m x n games.

UNIT – IV
REPLACEMENT AND SEQUENCING PROBLEMS

Replacement of equipment or asset that deteriorates gradually - Replacement of equipment that fails suddenly - Recruitment and promotion problem - Problem of sequencing - Problems with n jobs and 2 machines - Problems with n jobs and k machines - Problems 2 jobs and k machines.

UNIT – V
NETWORK MODELS

Network and basic components - Rules of network construction - Time calculations in networks - Critical path method (CPM) - PERT - PERT calculations - Negative float and negative Slack - Advantages of network (PERT/CPM) - Project Cost - Time Cost Optimization Algorithm - Linear Programming formulation - Precedence planning - Updating - Resource allocation Scheduling.

Remark: Each Unit has to be covered in 12 hours (each of 50 minutes duration). Questions may be set to test the problem solving ability of the students in the above topics.

PRESCRIBED BOOK

1. Kanti Swarup, P.K.Gupta and Man Mohan, Operations Research, Eighth Edition, Sultan Chand & Sons, New Delhi, 1999.

REFERENCE BOOKS

1. H.A.Taha, Operations Research, Sixth Edition, Mac Millen Ltd.,
2. Richard Bronson, Operations Research, (Schaum's Outline Series, McGraw Hill Company, 1982.
3. S.Hillier and J.Liebermann, Operations Research, Sixth Edition, Mc Graw Hill Company, 1995.
4. J.K.Sharma, Operation Research (Theory and Applications), Mac Millen Ltd., 1997.
5. Barry Render, Ralph M. Stair, Allynan Bacon, Quantitative Analysis for Management, Fifth Edition, Boston, 1994.

SOFTWARE ENGINEERING

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Knowledge of systematic and operational language

AIM :

The systematic Approach to the design, development, operation, and maintenance of a software system.

OBJECTIVES :

The Objective of this Course is to impart knowledge on

1. Apply software engineering theory, principles, tools and processes, as well as the theory and principles of computer science.
2. Design and experiment with software prototypes
3. Demonstrate professionalism including continued learning and professional activities
4. Build solutions using different technologies, architectures and life-cycle approaches in the context of different organizational structures
5. Insist the development, adoption and sustained use of standards of excellence for software engineering practices
6. Communicate effectively through software development
7. Contribute to society by behaving ethically and responsibly in software development

OUTCOME :

After completion of the course the students are expected to be able to:

1. Students will demonstrate basic knowledge in software engineering.
2. Students will be able to plan, design, develop and validate the software project
3. An ability to identify, formulates, and solves software engineering problems
4. students to develop skills that will enable them to construct software of high quality
5. Students will have an understanding of impact of sound engineering principles

UNIT – I

Introduction –Definition-S/W Engineering Paradigm – System engineering –Software characteristics -verification – validation- Software Cost Estimation Techniques-COCOMO-life cycle models-Water fall, Prototype, spiral, WINWIN Spiral, Agile, Evolutionary, Incremental, and Object oriented.

UNIT – II

System Analysis-Requirements analysis-Functional-Non-Functional-Analysis principles-Prototyping-Software Requirement Specification – data dictionary-data modeling, functional modeling and behavioral Modeling

UNIT – III

Design Process and Principles – Software design and types- Design concepts: Abstraction, Refinement, Modularity and software architecture control hierarchy, structural partitioning and information hiding. Effective modular design: functional independence cohesion and coupling – design documentation.

UNIT – IV

Design Standards: -User interface design, Transform mapping and Transaction mapping. Design for Real-time Systems: System Considerations -analysis and simulation of real time Systems, Software Configuration System.

UNIT – V

Software Testing Techniques: Software testing fundamentals-White Box Testing-Black box testing- Software Testing Strategies: A strategic approach to software testing- Unit testing-integration testing validation testing-system testing, Software Maintenance, Reverse Engineering and Re-Engineering.

TEXT BOOKS:

1. Roger Pressman.S., " Software Engineering : A Practitioner's Approach",McGraw Hill 4th edition 2011
2. I Sommerville, " Software Engineering 7th edition: ", Addison Wesley, 2007

REFERENCE BOOKS:

1. P fleeger, " Software Engineering ", Prentice Hall, 1999.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli " Fundamental of Software Engineering ", Prentice Hall of India.
3. Watts S.Humphrey,"A Discipline for Software Engineering", Pearson Education, 2007.

SOFTWARE DEVELOPMENT LAB USING CASE TOOLS

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Knowledge of UML Concepts and Software engineering principles.

AIM:

The main objective is to learn and to gain practical experience with some software engineering methodologies, methods and supporting tools.

OBJECTIVES :

The Object ive of this Course is to impart knowledge on :

1. Objective of this lab is to enable the student to practice the object-oriented analysis and design through UML on a particular application (Experiment/project)
2. The UML is to import state of the art knowledge on practical Applications and users in interactive manner through the web.

OUTCOME :

After completion of the course the students are expected to be able to:

1. Students will demonstrate basic knowledge in software engineering and UML Practical Applications.
2. Students will be able to plan, design, develop and validate the software project
3. Identify ambiguities, inconsistencies and incompleteness from a requirements specification
4. Identify and state functional requirements
5. Identify and state non-functional requirements
6. Students will be apply advance software methodology to create high quality WebApps

HARDWARE REQUIREMENTS:

Pentium 4 processor (2.4 GHz), 128 Mb RAM, Standard keyboard and mouse, monitor.

SOFTWARE REQUIREMENTS:

Rational Rose Enterprise Edition Windows XP/2000, MS OFFICE

(Choose any one project and do the following exercises for that project)

(or)

Prepare the following documents of the experiments listed below and develop the software development methodology

1. Program Analysis and Project Planning.
   Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
2. Software requirement Analysis
   Describe the individual Phases / Modules of the project, Identify deliverables.
3. Data Modeling
   Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.

4. Software Development and Debugging
5. Software Testing
6. Prepare test plan, perform validation testing, Coverage analysis, memory leaks, and develop-test case hierarchy, Site check and Site monitor.

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Court case management system
11. Share on line trading
12. Blood bank system
13. Hotel Management System
14. Hostel Management System
15. Library management system

VIII SEMESTER

ELECTIVES

LIST OF ELECTIVES

CODE	III YEAR
A	Advanced Computer System architecture
B	Advanced operating systems
C	Artificial Intelligence
D	E Commerce
E	Advance Databases
F	Management Information System
G	Cryptography and Network Security
H	Software Quality Assurance
I	Pervasive computing
J	Soft Computing

CODE	IV YEAR
K	Cloud Computing
L	Ethical Hacking and Digital Forensics
M	Middleware Technologies
N	DOT NET Technologies
O	Data Warehousing and Mining
P	Virtual Reality
R	Programming Mobile Applications
S	Parallel Programming With Cuda C
T	Enterprise Resource Planning
U	Social Network Analysis and Mining

A - ADVANCED COMPUTER SYSTEM ARCHITECTURE

3 2 0 3

UNIT – I

Introduction to Parallel Processing : Evolution of Computer System – Parallelism in Uniprocessor System - Parallel Computer Structures – Architectural Classification Schemes - Parallel Processing Applications.

UNIT – II

Principles of pipelining and Vector Processing : Principles of Linear pipelining - Classifications of pipeline processors - Interleaved memory organizations - Vector processing requirements - Characteristics of Vector Processing.

UNIT – III

Pipeline computers and Vectorization Methods : The Space of Pipelined Computers – Recent Vector Processors – The Architecture of Cyber - 205 - Vectorization and Optimization Methods - Parallel languages for Vector Processing - Optimization of Vector Functions – Performance Evaluation of Pipeline Computers.

UNIT – IV

Multiprocessor architecture : Functional structures - Lossely Coupled Multiprocessors - Tightly Coupled Multiprocessors - Processor characteristics for Multiprocessing - Interconnection Networks - Time Shared or common Buses – Performance of Interconnection Networks – Parallel Memory Organizations – Performance Tradeoffs in Memory Organizations - Classification of Multiprocessor Operating Systems – Data Flow Computer Architecture : Static and Dynamic Data Flow Computer.

UNIT – V

Advanced Processor Technology : Design Space of Processors – Instruction Set Architecture - CISC Scalar Processor – Example : Architecture of MC68040 Processor – RISC Scalar Processors – Example : SPARC Architecture

TEXT BOOKS

1. Kai Hwang and Faye A.Briggs, "Computer Architecture and parallel processing", McGraw Hill International Edition-15 (UNIT I ,II, III, IV)
2. Kai Hwang, “Advanced Computer Architecture”, Parallelism, Scalability, Programmability McGraw Hill Second Edition 18th Reprint 2008 (UNIT V)

B - ADVANCED OPERATING SYSTEMS

3 2 0 3

UNIT- I
INTRODUCTION

Overview - Functions of an Operating System – Design Approaches – Types of Advanced Operating System - Synchronization Mechanisms – Concept of a Process, Concurrent Processes – The Critical Section Problem, Other Synchronization Problems – Language Mechanisms for Synchronization – Axiomatic Verification of Parallel Programs – Process Deadlocks - Preliminaries – Models of Deadlocks, Resources, System State – Necessary and Sufficient conditions for a Deadlock – Systems with Single-Unit Requests, Consumable Resources and Reusable Resources**.**

UNIT II
DISTRIBUTED OPERATING SYSTEMS

Introduction – Issues – Communication Primitives – Inherent Limitations - Lamport's Logical Clock; Vector Clock; Causal Ordering; Global State; Cuts; Termination Detection. Distributed Mutual Exclusion – Non-Token Based Algorithms – Lamport's Algorithm - Token-Based Algorithms – Suzuki-Kasami's Broadcast Algorithm – Distributed Deadlock Detection – Issues – Centralized Deadlock-Detection Algorithms - Distributed Deadlock-Detection Algorithms - Agreement Protocols – Classification - Solutions –Applications.

UNIT III
DISTRIBUTED RESOURCE MANAGEMENT

Distributed File systems – Architecture – Mechanisms – Design Issues – Distributed Shared Memory – Architecture – Algorithm – Protocols - Design Issues. Distributed Scheduling – Issues and Components .

UNIT IV
FAULT TOLERANCE

Basic Concepts-Classification of Failures – Basic Approaches to Recovery- Recovery in Concurrent System- Synchronous and Asynchronous Checkpointing and Recovery- Check pointing in Distributed Database Systems- Fault Tolerance- Issues - Two-phase and Nonblocking Commit Protocols- Voting Protocols- Dynamic Voting Protocols.

UNIT V
MULTIPROCESSOR AND DATABASE OPERATING SYSTEMS

Structures – Design Issues – Threads – Process Synchronization – Processor Scheduling – Memory Management – Reliability / Fault Tolerance; Database Operating Systems – Introduction– Concurrency Control – Distributed Database Systems – Concurrency Control & Algorithms.

TEXT BOOK

Mukesh Singhal and N. G. Shivaratri, "Advanced Concepts in Operating Systems", McGraw- Hill Edition 2001 21st reprint 2008.

REFERENCES

1. Abraham Silberschatz, Peter B. Galvin, G. Gagne, "Operating System Concepts", Sixth Edition, Addison Wesley Publishing Co., 2003.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley,2001.

C - ARTIFICIAL INTELLIGENCE

3 2 0 3

UNIT - I
PROBLEM SOLVING

Introduction – Agents – Problem formulation – uninformed search strategies – heuristics – informed search strategies – constraint satisfaction.

UNIT - II
LOGICAL REASONING

Logical agents – propositional logic – inferences – first-order logic – inferences in first order logic – forward chaining – backward chaining – unification – resolution

UNIT- III
PLANNING

Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world – Introduction to knowledge representation (Semantic nets).

UNIT- IV
UNCERTAIN KNOWLEDGE AND REASONING

Uncertainty – review of probability - probabilistic Reasoning – Bayesian networks – inferences in Bayesian networks – Temporal models – Hidden Markov models

UNIT- V
LEARNING

Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

TEXT BOOK:

S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education 2003.

REFERENCES:

1. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence : a logical approach", Oxford University Press, 2004.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, Pearson Education, 2002.

D - ELECTRONIC COMMERCE

3 2 0 3

UNIT- I

Introduction – Electronic Commerce Framework – The Anatomy of E-Commerce Applications. The Network Infrastructure for E-Commerce, The Internet as a Network Infrastructure.

UNIT- II

Electronic Payment Systems, Interorganizational Commerce and EDI, EDI Implementation, MIME and Value – added Networks.

UNIT - III

Advertising and Marketing on the Internet, Computer Based Education and Training, Technological Components of Education on-Demand, Digital Copy rights and Electronic Commerce, Software Agent.

UNIT - IV

The Corporate Digital Library – Dimensions of Internal Electronics Commerce Systems, Making a Business case for a document Library, Types of Digital documents, Issues behind document Infrastructure, Corporate data warehouses, Documents Active / Compound document architecture.

UNIT - V

Multimedia and Digital Video – Broad band Telecommunications – Mobile and Wireless Computing Fundamentals.

TEXT BOOK

1. Kalakota & Whinston , "Frontiers of Electronic Commerce", Pearson Education, 2002.

REFERENCES

1. Kamalesh K. Bajaj, "E-Commerce: The Cutting Edge & Business", Tata McGraw- Hill,2003.
2. Brenda Kennan, "Managing your E-Commerce Business", PHI, 2001.
3. "Electronic Commerce from Vision to Fulfillment", PHI, Elias M. Awad, Feb-2003.
4. "Electronic Commerce – Framework, Technology and Application", TMH, Bharat Bhaskar,2003.
5. Effy Oz, " Foundations of E-Commerce", PHI, 2001.
6. Jim A Carter, "Developing E-Commerce Systems", PHI, 2001.

E - ADVANCED DATABASES

3 2 0 3

UNIT - I
DISTRIBUTED AND PARALLEL DATABASES

Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing- Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism –– Case Studies.

UNIT - II
OBJECT-ORIENTED DATABASES

Object oriented data model: Object structure -object classes–Inheritance–Object Identity- Object Containment- Persistent Programming Languages– Persistent C++ Systems: ODMG C++ ODL – ODMG C++ OML– OQL – Persistent Java Systems.

UNIT - III
XML DATABASES

XML Databases: Structure of XML data- DTD - XML Schema - Querying and Transformation: XPath - XSLT- XQuery - XML Applications.

UNIT- IV
MOBILE DATABASES

Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols- Mobile Database Recovery Schemes.

UNIT- V
MULTIMEDIA DATABASES

Image Databases: Representing Image DBs with Relations and R-Trees – Text/Document Databases: TV-Trees - Video Databases : Video Segmentation and Standards– Audio Databases – Multimedia Database Design.

TEXT BOOKS:

1. Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, Fourth Edition, McGraw Hill, 2002.
2. Vijay Kumar, “ Mobile Database Systems”, John Wiley & Sons, 2006.
3. V.S.Subramanian, “Principles of Multimedia Database Systems”, Harcourt India Pvt Ltd.,2001.

Unit – I Chapter19,20 Refer Henry F Korth, Abraham Silberschatz, S. Sudharshan
Unit - II Chapter 8 Refer Henry F Korth, Abraham Silberschatz, S. Sudharshan
Unit - III Chapter 10 Refer Henry F Korth, Abraham Silberschatz, S. Sudharshan
Unit -IV Chapter 3,6.2,7.6,7.13,7.14,8.3Refer Vijay Kumar
Unit - V Chapter 5.6, 5.7 ,6.4, 7.3, 7.4, 8, 9.2 Refer V.S.Subramanian

REFERENCES:

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education/Addison Wesley, 2007.
2. Thomas Cannolly and Carolyn Begg, “ Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education, 2007.

F - MANAGEMENT INFORMATION SYSTEMS

3 2 0 3

UNIT- I
INTRODUCTION

Definition of MIS- Data Processing- Information Resources Management- Computing Techniques, evolution, types based on functions and hierarchy, System Analyst – Role, Functions, OR Management theory-, Subsystems of MIS, DBQL, Tools , Systems Strategies- Communication ,On line, Distributed systems With FEP, LAN , WAN Features.

UNIT- II
LOGICAL DATA CONCEPTS & SYSTEMS ANALYSIS AND DESIGN

Introduction and importance of Logical Data Concepts-,Comparison between Sequencing of data and Logical data -Types of Files and File Organization-Database Organization Transaction Processing-Control and retrieval techniques, Processing tools in Multimedia- Message Systems-,Scope of Systems analysis and design – Similarities of MIS Tools With DBMS, RDBMS, OODBMS.

UNIT - III
DECISION MAKING PROCESS & INFORMATION SYSTEMS

Definition and Criteria for DMP, Various types of decision Making models- Incremental Decision Making – Optimization Techniques under Certainty – Pay off Matrices – Tree based Decision – Games Theory – Support for Decision Making Phases- Financial, Marketing and International Information Systems – KMS.

UNIT IV
MEASUREMENT OF INFORMATION SYSTEM DESIGN WITH SUB SYSTEMS CONCEPTS

Definition of Information – Redundancy – Sending and Receiving efficiency – Metrics of Information Systems, Types of Sub systems and its Usage – Decoupling Of information Systems- Pervasive Computing.

UNIT V
PLANNING MODELS AND NEW IT INITIATIVES

Hierarchy of Planning- Models- Computational Support for Planning – Choice, Design and Intelligence phases, Planning Software Systems, e- business, e-governance, ERP, e-CRM, Business Intelligence, Pervasive Computing- CMM.

TEXT BOOKS

Gordon B. Davis And Maggrethe H.Olson , Management Information Systems, Mc Graw Hill International Edition – Second Edition , 1998

REFERENCES

1. Robert Schultheis and Mary Summer, Management Information Systems – The Managers View, Tata McGraw Hill, 2008.
2. Kenneth C. Laudon and Jane Price Laudon, Management Information Systems.

G - CRYPTOGRAPHY AND NETWORK SECURITY

3 2 0 3

UNIT - I
INTRODUCTION

Introduction to Network Security - Attacks- Services- Mechanism – Conventional Encryption Principle – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation - Triple DES – Placement of Encryption Function – Traffic Confidentiality – Key Distribution.

UNIT - II
PUBLIC KEY CRYPTOGRAPHY

Introduction to Number Theory(Prime Numbers, Fermat's & Euler's Theorem, Testing for (Primality)-Public Key Cryptography – RSA - Diffie-Hellman key Exchange - Key Management.

UNIT - III
AUTHENTICATION AND HASH FUNCTION

Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm - Secure Hash Algorithm – HMAC - Digital Signatures – Authentication Protocols – Digital Signature Standard

UNIT- IV
NETWORK SECURITY

Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security – PGP – S/MIME - IP Security – Web Security.

UNIT- V
SYSTEM LEVEL SECURITY

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

TEXT BOOK:

William Stallings, "Cryptography and Network Security – Principles and Practices", Prentice Hall of India, Fourth Edition 2006.

REFERENCES :

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill,2003.
2. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
3. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003

H - SOFTWARE QUALITY ASSURANCE

3 2 0 3

UNIT - I
FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE

The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management

UNIT - II
MANAGING SOFTWARE QUALITY

Managing Software Organizations – Managing Software Quality – Defect Prevention – Software Quality Assurance Management

UNIT - III
SOFTWARE QUALITY ASSURANCE METRICS

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics Analysis

UNIT- IV
SOFTWARE QUALITY PROGRAM

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

UNIT- V
SOFTWARE QUALITY ASSURANCE STANDARDIZATION

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

TEXT BOOKS:

1. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", Vikas Publishing House, Pvt, Ltd., New Delhi 1997.(UNIT III to V)
2. Watts S Humphrey, " Managing the Software Process", Pearson Education Inc 1989. (UNIT I and II)

REFERENCES:

1. Gordon G Schulmeyer, "Handbook of Software Quality Assurance", Third Edition, Artech House Publishers 2007
2. Nina S Godbole, "Software Quality Assurance: Principles and Practice", Alpha Science International, Ltd, 2004

I - PERVASIVE COMPUTING

3 2 0 3

UNIT - I

Pervasive Computing Application - Pervasive Computing devices and Interfaces - Device technology trends, Connecting issues and protocols.

UNIT- II

Pervasive Computing and web based Applications - XML and its role in Pervasive Computing - Wireless Application Protocol (WAP) Architecture and Security – Wireless Mark-Up language (WML) – Introduction.

UNIT- III

Voice Enabling Pervasive Computing - Voice Standards - Speech Applications in Pervasive Computing and security.

UNIT - IV

PDA in Pervasive Computing – Introduction - PDA software Components, Standards, emerging trends - PDA Device characteristics - PDA Based Access Architecture.

UNIT - V

User Interface Issues in Pervasive Computing, Architecture - Smart Card- based Authentication Mechanisms - Wearable computing Architecture.

TEXT BOOKS

1. Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaec & Klaus Rindtorff.
2. Pervasive Computing Technology and Architecture of Mobile Internet Applications, Addision Wesley, Reading, 2002.
3. Uwe Ha nsman, Lothat Merk, Martin S Nicklous & Thomas Stober: Principles of Mobile Computing, Second Edition, Springer- Verlag, New Delhi, 2003.

REFERENCES

1. Rahul Banerjee: Internetworking Technologies: An Engineering Perspective, Prentice – Hall of India, New Delhi, 2003. (ISBN 81-203-2185-5) (Units I,II & III)
2. Rahul Banerjee: Lecture Notes in Pervasive Computing, Outline Notes, BITS-Pilani, 2003. (Units IV & V)

J - SOFT COMPUTING

3 2 0 3

UNIT- I
SOFT COMPUTING TECHNIQUES

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization –Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT- II
FUZZY INFERENCE SYSTEMS AND MODELS

Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules - Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT- III
NEURAL NETWORKS

Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT - IV
NEURO FUZZY MODELING

Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT - V
APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK

J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", Pearson Education 2004.

REFERENCES

1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
2. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.
4. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP

K - CLOUD COMPUTING

3 2 0 3

UNIT- I
UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

UNIT - II
DEVELOPING CLOUD SERVICES

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On- Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

UNIT- III
CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT - IV
USING CLOUD SERVICES

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files.

UNIT- V
OTHER WAYS TO COLLABORATE ONLINE

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

TEXT BOOKS :

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On- demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

CLOUD COMPUTING LAB

0 0 3 2

LIST OF EXERCISE

1. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.
2. Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.
3. Install a C compiler in the virtual machine and execute a sample program.
4. Show the virtual machine migration based on the certain condition from one node to the other.
5. Find procedure to install storage controller and interact with it.
6. Service deployment & Usage over cloud.
7. Cloud Security Management.
8. Performance evaluation of services over cloud.

L - ETHICAL HACKING AND DIGITAL FORENSICS

3 2 0 3

ETHICAL HACKING LAB

0 0 3 2

M - MIDDLEWARE TECHNOLOGIES

3 2 0 3

UNIT - I
CLIENT / SERVER CONCEPTS

Client-Server - File server - Database server - Group server - Object server – Web server - Middleware - General middleware - Service specific middleware - Client / server building blocks - RPC - Messaging - Peer-to-Peer.

UNIT- II
EJB ARCHITECTURE

EJB - EJB architecture - Overview of EJB software architecture - View of EJB - Conversation - Building and deploying EJBs - Roles in EJB.

UNIT- III
EJB APPLICATIONS

EJB session beans - EJB entity beans - EJB clients - EJB deployment - Building an application with EJB.

UNIT- IV
CORBA

CORBA - Distributed systems - Purpose - Exploring CORBA alternatives - Architecture overview - CORBA and networking Model - CORBA object model - IDL - ORB - Building an application with CORBA.

UNIT- V
COM

COM - Data types - Interfaces - Proxy and stub - Marshalling – Implementing Server/Client - Interface pointers - Object creation - Invocation - Destruction - Comparison COM and CORBA - Introduction to .NET - Overview of .NET architecture - Marshalling - Remoting.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, “The Essential Client/Server Survival Guide”, Galgotia Publications Pvt. Ltd., 2002.
2. Tom Valesky, “Enterprise Java Beans”, Pearson Education, 2002
3. Jason Pritchard, “COM and CORBA side by side”, Addison Wesley, 2000
4. Jesse Liberty, “Programming C#”, 2nd Edition, O’Reilly Press, 2002.

REFERENCES

1. Mowbray, “Inside CORBA”, Pearson Education, 2002.
2. Puder, “Distributed System Architecture – A Middleware Approach”, Elsevier, 2008.

MIDDLEWARE TECHNOLOGY LAB

0 0 3 2

LIST OF EXPERIMENTS

Apply the following to typical application problems

1. JAVA RMI
2. CORBA
3. COM
4. C# AND .NET

A possible set of applications may be the following

1. Typical experiment to investigate client-server communication
2. Typical experiment to investigate The working of RMI
3. Typical experiment to investigate The use of CORBA TECHNOLOGY WITH JAVA
4. CHAT ROOM
5. DESIGNING E-BUSINESS
6. ONLINE GAMES

N - DOT NET TECHNOLOGIES

3 2 0 3

UNIT- I

Programming Models – Introduction to .NET Framework – Evolution of .NET technologies - CTS, CLS, CLR, MSIL, JIT, Assemblies, .NET Security Model – Introduction to Base Class Library - Introduction to VB.NET - Working with Visual Studio IDE – IDE Components – Environment Options -VB.NET Fundamentals – Variables – Data Types – Arrays – Control Flow Statements – Modular Coding – Subroutines – Functions – Argument Passing

UNIT – II

Classes – Instance Fileds – Constructors – Properties – Methods – Object – Inheritance – Static Classes – Interfaces -Exception Handling– Need – Models – Statements – Creating Exception Classes - Collections – Arrays – ArrayList Collection – HashTable Collection – SortedList Class – IEnumerator and IComparer Interfaces Handling Strings, Characters and Dates – File Class - Directory Class – Accessing Files – FileStream– StreamWriter– StreamReader– BinaryWriter- Binary Reader

UNIT - III

Windows Forms – Form Properties – Form Events - Building Dynamic Forms at Runtime - Introduction to Components and controls – Adding Components and controls to forms – Layout and Grouping – Responding to User Inputs – Mouse and Keyboard Events – Designing Menus – Building MDI Applications- Reading Input through Controls – Presentation and Information Controls – Common Dialog Controls – RichTextBox Control - Creating Windows Installer

UNIT- IV

ADO.NET Architecture – DataSet – DataGrid Control- Data Binding – DataAdapter – Command Objects – DataReader - Performing Updates-Introduction to Web Programming – Building Web Applications – Web Controls - Interacting with Web Applications – Maintaining State – ASP.NET Objects – Page Object – Response Object – Request Object – Server Object – Deploying ASP.NET Applications

UNIT- V

Data-Bound Web Controls – Simple Data binding – Binding to DataSets – Customizing dataGrid Control -Building and Consuming Web Services – ASP.NET Web Service Projects - Theoretical Introduction to C# and Comparison with VB.

TEXT BOOKS:

1. Jeffrey R. Shapiro, VB.NET Complete Reference , Tata McGrawHill , 9th Reprint 2006 (Units 1 & 2)
2. Evangelos Petroutsos , Mastering Visual Basic. NET, BPB Publications Reprinted 2005 (Units 1 & 2)
3. Michael Otey , Denielle Otey, ADO.NET Complete Reference, Tata McGrawHill, 4th reprint 2005 (Unit IV & V)
4. Evangelos Petroutsos , Ali Bilgin, .Mastering Visual Basic. NET Database Programming
5. BPB Publications – 2002 (Unit 1 & 2)
6. Pro C# with .NET 3.0 – Andrew Troelsen – Special Edition 2007 (Unit V)

DOT NET LAB

0 0 3 2

1. Create a windows form with the following controls Textbox, Radio button, Check box, Command Button
2. Write a program for Menu option.
3. Create a program to connect with database and manipulate the records in the database using ADO .NET
4. Create a program to implement the concepts of OOPS for creating class, inheritance
5. Create a program to perform input validation using procedure.
6. Write a program to open a file and using I/O operations write contents into a file and read the contents from the file.
7. Create a window form using HTML controls.
8. Create a program to perform validation using validation controls.
9. Create a program in ASP .NET to connect with the database using ADODB connectivity and manipulate the records.
10. Write a program to store the employee details using class and methods in C# .NET
11. Write a program to Handle Exceptions
12. Write a program to create a form with Basic controls. In c#. NET.

O - DATA WAREHOUSING AND DATA MINING

3 2 0 3

UNIT- I
DATA WAREHOUSE

Evolution of Data base Technology - Definition: Data Warehouse - Differences between Operational Data base systems and Data Warehouses - Multidimensional Data Model - OLAP Operations - Warehouse Schema - Data Warehousing Architecture - Warehouse Server - Metadata - OLAP engine - The tasks in Building a Data Warehouse - Data warehouse backend Process - Data warehouse applications

UNIT- II
INTRODUCTION TO DATA MINING

Data mining: Definition - Knowledge discovery in database (KDD) vs. Data mining - DBMS vs DM– Stages of the Data Mining Process-task primitives, Data Mining Techniques -Data mining knowledge representation – Data mining query languages, Integration of a Data Mining System with a Data Warehouse – Issues, Data preprocessing – Data cleaning, Data transformation, Feature selection, Dimensionality reduction, Discretization and generating concept hierarchies- Mining frequent patterns- association-correlation.

UNIT - III
CLASSIFICATION & CLUSTERING

Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Clustering techniques – , Partitioning methods- k-means- Hierarchical Methods – distance based agglomerative and divisive clustering– Outlier Analysis

UNIT- IV

Introduction to Mining Data Streams – Mining Time-Series Data – Graph Mining – Social Network Analysis

UNIT - V
APPLICATION ,PRODUCT AND CASE STUDIES

Data warehousing and mining Applications - Products - Case studies - The Future of Data Mining - Privacy and Security of Data Mining

TEXT BOOK

J.Han,M.Kamber , "Data Mining: Concepts and Techniques", Academic Press, MorganKaufman Publishers, 2nd edition 2006

REFERENCE BOOKS

1. Arun K Pujari ," Data mining" , Andhra University Press
2. C.S.R. Prabhu , "Data Ware housing: Concepts, Techniques, Products and Applications", Prentice Hall of India, 2001.
3. W.H.lnmon," Building the Data Warehouse" , 3rd Edition, Wiley Dreamtech '02.
4. Sam Anabory & Dennis Murray, "Data Warehousing in the real world", Addisson
5. Wesley,1997
6. Morgrat A. Dunham, " Introduction to Data Mining techniques", Pearson Education.

DATA WAREHOUSING AND DATA MINING – LAB

0 0 3 2

To implement multi-dimensional data model using SQL queries

To perform various OLAP operations such slice, dice, roll up, drill up, pivot etc

Introduction to Data Mining Tool

Data Pre-processing using tool

Classification using tool

Clustering using tool

Association rule mining using tool

Introduction to writing custom programs to perform data mining

REFERENCES:

Ian H. Witten & Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, The Morgan Kaufmann Series in Data Management Systems , Third EditionTool companion manual(s).

P - VIRTUAL REALITY

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Basic Knowledge of Virtual and Mixed Reality

AIM:

This course provides a detailed understanding of the concept of Virtual Reality and its applications

OBJECTIVES:

The Objective of this Course is to impart knowledge on :

1. To understand geometric modeling and Virtual environment.
2. To study about Virtual Hardware and Software
3. To develop Virtual Reality applications

OUTCOME:

UNIT – I
INTRODUCTION TO VIRTUAL REALITY (9 hours)

Virtual Reality & Virtual Environment : Introduction – Computer graphics – Real time computer graphics –Flight Simulation – Virtual environments –requirement –benefits of virtual reality- Historical development of VR : Introduction – Scientific Landmark -3D Computer Graphics :Introduction – The Virtual world space – positioning the virtual observer – the perspective projection – human vision – stereo perspective projection – 3D clipping – Colour theory – Simple 3D modeling 176 CS-Engg&Tech-SRM-2013– Illumination models – Reflection models – Shading algorithms- Radiosity –Hidden Surface Removal – Realism-Stereographic image.

UNIT – II
GEOMETRIC MODELLING (9 hours)

Geometric Modeling: Introduction – From 2D to 3D – 3D space curves – 3D boundary representation - Geometrical Transformations: Introduction – Frames of reference – Modeling transformations – Instances –Picking – Flying – Scaling the VE – Collision detection - A Generic VR system: Introduction – The virtual environment – the Computer environment – VR Technology – Model of interaction – VR Systems.

UNIT – III
VIRTUAL ENVIRONMENT (9 hours)

Animating the Virtual Environment: Introduction – The dynamics of numbers – Linear and Non-linear interpolation - The animation of objects – linear and nonlinear translation - shape & object inbetweening – free from deformation – particle system- Physical Simulation : Introduction – Objects falling in a gravitational field – Rotating wheels – Elastic collisions – projectiles – simple pendulum – springs – Flight dynamics of an aircraft.

UNIT – IV
VR HARDWARES & SOFTWARES (9 hours)

Human factors : Introduction – the eye - the ear - the somatic senses - VR Hardware : Introduction – sensor hardware – Head-coupled displays –Acoustic hardware – Integrated VR systems-VR Software: Introduction –Modeling virtual world –Physical simulation-VR toolkits – Introduction to VRML.

UNIT – V
VR APPLICATION (9 hours)

Virtual Reality Applications: Introduction – Engineering – Entertainment – Science– Training – The Future: Introduction – Virtual environments – modes of interaction.

TEXT BOOK:

1. John Vince, "*Virtual Reality Systems* ", Pearson Education Asia, 2007.

REFERENCE BOOKS:

1. Adams, "*Visualizations of Virtual Reality*", Tata McGraw Hill, 2000.
2. Grigore C. Burdea, Philippe Coiffet , "*Virtual Reality Technology*", Wiley Interscience, 2nd Edition, 2006.
3. William R. Sherman, Alan B. Craig, "*Understanding Virtual Reality: Interface, Application, and Design*", Morgan Kaufmann, 2008.
4. www.vresources.org.
5. www.vrac.iastate.edu.
6. www.w3.org/MarkUp/VRML

VIRTUAL REALITY LAB

0 0 3 2

PREREQUISITE:

Basic Knowledge of JAVA 3D and Virtual Reality

PURPOSE

This lab course will enable the students to implement 3D shapes and scenes using JAVA 3D and VRML [VIRTUAL REALITY MODELING LANGUAGE].

INSTRUCTIONAL OBJECTIVES

1. To develop solutions to demonstrating the usage of 3D shapes and Scene creating a VRML pages in browser.
2. To learn and practice virtual reality
3. To learn and practice Java 3D shapes

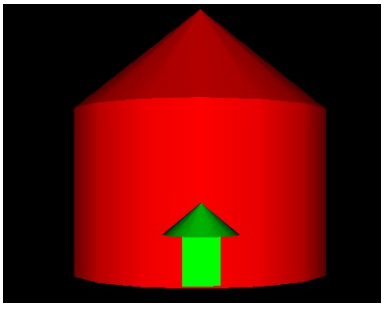
LIST OF EXPERIMENTS

A. PROGRAMMING IN JAVA 3D

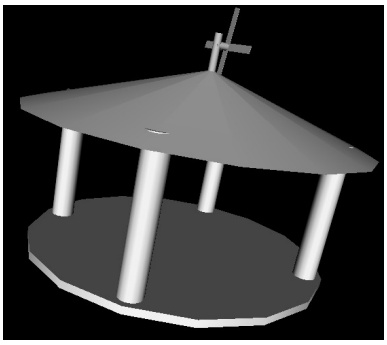
1. To write a program to draw pyramid using Java 3D
2. To write a program to display Text 3D using Java 3D
3. To write a program to draw a Sphere using Java 3D
4. To write a program to display a ball lit by a red light using Java 3D
5. To write a program to geometric projections
6. To write a program to convert between color models using java 3D

B. PROGRAMMING IN VRML

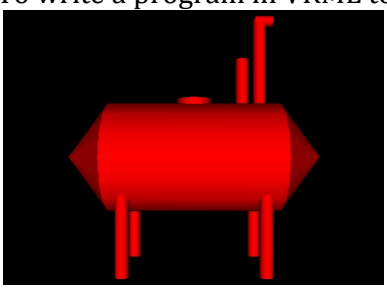
1. To write a program in VRML to draw a box with desired size and color.
2. To write a program in VRML to draw a Sphere
3. To write a program in VRML to draw a Cylinder
4. To write a program in VRML to draw a Cone
5. To write a program in VRML to draw a Rectangle
6. To write a program in VRML to draw a house like structure combine different shapes like Cone, Cylinder, Box.



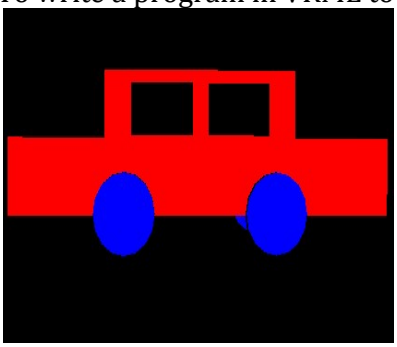
7. To write a program in VRML to draw design



8. To write a program in VRML to draw design



9. To write a program in VRML to draw design



REFERENCE :

a. TEXT BOOK :

1. Java 3D Programming –Daniel Selman
2. Virtual Reality Technology – G.Burdea and P.Coiffet

b. WEBSITE REFERENCE :

http://www.vads.ac.uk/guides/vr_guide/sect39.html
http://www.cs.indiana.edu/l/www/classes/jett/ewernert/#2._VRML_and_Java

Q - PROGRAMMING MOBILE APPLICATIONS

3 2 0 3

(For students Admitted from 2014 onwards)

PRE-REQUISITE :

Basics Of any Web Programming Language and JavaScript.

AIM:

To build and develop simple Mobile Applications using latest technologies.

OBJECTIVES:

The Objective of this Course is to impact knowledge on:

1. To Introduce the basic concepts of Mobile Technologies and Programming.
2. To help them develop their own Mobile Apps in various Platforms.
3. To make them acquire and learn Programming for creating Mobile Apps.

OUTCOME:

After Completion Of the course students are expected to be able to:

1. Understand the basics of Mobile Technologies.
2. Develop Simple Apps. In various Mobile Phone Operating system..

UNIT – I
INTRODUCTION TO MOBILE TECHNOLOGIES

Introduction to Mobile OS-Types-History-Importance-Coding for Mobile Technologies - Applications.

UNIT–II
DEVELOPING WINDOWS STORE APPS

Basics of HTML and Javascript-Developing Apps With Javascript: Introduction-Binding Data to the App-Making the App Responsive-Adding Menus and Commands-Packaging and Publishing.

UNIT–III
PROGRAMMING ANDROID APPLICATIONS

Developing With Eclipse: Anatomy of The Eclipse Workspace-Architecture-Exploring Eclipse-Activities In Android-Creating Simple Applications in Android using Eclipse

Developing With Android Studio: Anatomy of Android Studio-Screen Layout Design-UI Design-Simulating Events -Creating Simple applications in Android using Android Studio.

UNIT – IV
PROGRAMMING APPLE iOS

Introduction to XCode-Building Interface-Coming Events-Table Manners-Editing-Writing Simple Application Program for Spin A Web and Eight Ball Application.

UNIT – V
PROGRAMMING BLACKBERRY TABLET APPLICATIONS

Introduction-Application Layouts-Exploring the API's-Working With The File System-OS Interactions.

TEXT BOOKS

1. Unit – I Rammie Sarienddine ,"Developing Windows Store Apps With HTML 5 and Javascript", -Packt Publishing-2013.
2. Unit – II Rammie Sarienddine ,"Developing Windows Store Apps With HTML 5 and Javascript", -Packt Publishing-2013.(Chapters:4,5,6,9 and 10).
3. Unit – III Wallace Jackson **,"**Android Apps For Absolute Beginners", -Apress – 2011.(Chapters:6&7).
4. Unit – III Onur Cinar,"Android Apps With Eclipse", -Apress-2012(Chapter:3).
5. Unit – III Grant Allen,"Beginning Android 4", -Apress-2012(Chapter:2).
6. Unit – IV James Bucaneck,"Learn iOS 7 App Development", -Apress-2012.
7. Unit – V Rich Tretola ,"Developing Blackberry Tablet Applications With Flex 4.5", -Oreilley-2011.

MOBILE APPLICATIONS LABORATORY

0 0 3 2

(For students Admitted from 2014 onwards)

PRE-REQUISITE:

Basics Of any Web Programming Language and JavaScript

AIM:

To build and develop simple Mobile Applications using latest technologies.

OBJECTIVES:

The Objective of this Course is to impact knowledge on:

1. To Introduce the basic concepts of Mobile Technologies and Programming.
2. To help them develop their own Mobile Apps in various Platforms.
3. To make them acquire and learn Programming for creating Mobile Apps.

OUTCOME:

After Completion Of the course students are expected to be able to:

1. Understand the basics of Mobile Technologies.
2. Develop Simple Apps. In various Mobile Phone Operating system.

LIST OF EXCERCISES

Windows Mobile Applications

1. Caller Id Notification Menu.
2. An Online Shopping Catalogue with the specifications.
3. You Tube Search Engine.

Blackberry Applications

1. Creating A Simple Login Form with all the menus and displaying the same.
2. A Student Database search and performing data Manipulation operations.
3. Creating a Web Browser and launch an application.

Android Applications

1. A Simple Gaming Application.
2. Designing Contact List and retrieving the details from the database.
3. Creating Menus.

Apple iOS Applications

1. Create a Simple Login Form For an Employee and display in a new page.
2. Data Manipulation for a Student Database.
3. Create a simple basic Arithmetic Calculator

R - PARALLEL PROGRAMMING WITH CUDA C

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE:

Comfortable programming in C, knowledge of data structures & algorithms and computer architecture.

AIM:

This subject aims to help students to understand the power and limitations of parallel and systems and to understand the beneficial and challenging aspects of parallelism.

OBJECTIVES:

With the growing number of cores on a chip, programming them efficiently has become an indispensable knowledge for the future. Parallel Programming is a hands-on course involving significant parallel programming on compute-clusters, multi-core CPUs and massive-core GPUs

OUTCOME:

After successfully completing this course a student should be able to

1. Design, implement, test and debug a parallel application program using CUDA C
2. Parallelize an existing application using an appropriate parallel programming paradigm

UNIT – I
HISTORY OF GPU COMPUTING

Introduction -GPUs as Parallel Computers-Architecture of a Modern GPU -Parallel Programming Languages and Models -Evolution of Graphics Pipelines -Evolution of Programmable Real-Time Graphics -Unified Graphics and Computing Processors -GPGPU: An Intermediate Step -GPU Computing -Scalable GPUs -Recent Developments. -Future Trends.

UNIT – II
INTRODUCTION TO CUDA & CUDA THREADS

Data Parallelism -CUDA Program Structure -Device Memories and Data – Transfer Kernel Functions and Threading -CUDA Thread Organization -Using blockIdx and threadIdx -Synchronization and Transparent Scalability -Thread Assignment -Thread Scheduling and Latency Tolerance.

UNIT – III
CUDA MEMORIES & PERFORMANCE CONSIDERATIONS

Importance of Memory Access Efficiency-CUDA Device Memory Types .-A Strategy for Reducing Global Memory Traffic -Memory as a Limiting Factor to Parallelism -More on Thread Execution -Global Memory Bandwidth -Dynamic Partitioning of SM Resources-Data Prefetching -Instruction Mix -Thread Granularity and Measured Performance.

UNIT – IV
PARALLEL PROGRAMMING AND COMPUTATIONAL THINKING

Goals of Parallel Programming -Problem Decomposition -Algorithm Selection Computational Thinking -Floating point considerations -Application CASE studies.

UNIT – V
INTRODUCTION TO CUDA LIBRARIES

CUDA API -cuFFT – Fast Fourier Transforms Library, cuBLAS – Complete BLAS Library, cuSPARSE – Sparse Matrix Library, cuRAND – Random Number Generation (RNG) Library , NPP – Performance Primitives for Image & Video Processing, Thrust – Templated C++ Parallel Algorithms & Data Structures, math.h -C99 floating-point Library.

TEXT BOOK

1. David B. Kirk, Wen-mei W. Hwu." Programming Massively Parallel Processors: A Hands-on Approach", Morgan Kaufmann, 2010.
2. http://docs.nvidia.com/cuda/index.html

REFERENCE

1. https://developer.nvidia.com/udacity-cs344-intro-parallel-programming

PARALLEL PROGRAMMING WITH CUDA C - LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

comfortable programming in C, knowledge of data structures & algorithms and computer architecture.

AIM :

This subject aims to help students to understand the power and limitations of parallel and systems and to understand the beneficial and challenging aspects of parallelism.

OBJECTIVES :

The Objective of this Course is to impact knowledge on:

With the growing number of cores on a chip, programming them efficiently has become an indispensable knowledge for the future. Parallel Programming is a hands-on course involving significant parallel programming on compute-clusters, multi-core CPUs and massive-core GPUs.

OUTCOME :

After Completion Of the course students are expected to be able to:

1. Design, implement, test and debug a parallel application program using CUDA C
2. Parallelize an existing application using an appropriate parallel programming paradigm

LIST OF EXCERCISES

1. Displaying CUDA device properties
2. Simple program to implement Map operation.
3. Simple Program to implement Gather and Scatter operation.
4. Simple Program to implement Stencil operation.
5. Simple program to implement Sorting
6. Simple program to implement Transpose operation
7. Implementation of Matrix Multiplication with efficient handling of GPU memory
8. Implement Jacobian iteration using openacc
9. Implement Saxpy using openacc and compare the performance of with/without acceleration
10. Implement a program using CUBLAS.

TEXT BOOK

JASON SANDERS , EDWARD KANDROT, “CUDA By Example - an introduction to general-purpose GPU programming”, Addison-Wesley,

REFERENCE BOOK

https://www.udacity.com/course/cs344

S - ENTERPRISE RESOURCE PLANNING

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Knowledge of Enterprise applications and activities.

AIM :

Enterprise Resource Planning (ERP) a group of integrated software modules used to run virtually all business processes in an organization. The course explains and demonstrates how business processes such as sales logistics, production/material management, procurement, and human resources are supported in an ERP software package.

OBJECTIVES :

The Objective of this Course is to impact knowledge on:

1. The basic concepts of ERP systems for manufacturing or service companies, and the differences among MRP, MRP II, and ERP systems;
2. Thinking in ERP systems: the principles of ERP systems, their major components, and the relationships among these components;
3. In-depth knowledge of major ERP components, including material requirements planning, master production scheduling, and capacity requirements planning;
4. Knowledge of typical ERP systems, and the advantages and limitations of implementing such systems.

OUTCOME:

After Completion Of the course students are expected to be able to:

1. Examine systematically the planning mechanisms in an enterprise, and identify all components in an ERP system and the relationships among the components;
2. Understand production planning in an ERP system, and systematically develop plans for an enterprise;
3. Use methods to determine the correct purchasing quantity and right time to buy an item, and apply these methods to material management;
4. Understand the difficulties of a manufacturing execution system, select a suitable performance measure for different objectives, and apply priority rules to shop floor control.

UNIT- I

ERP AND TECHNOLOGY: Introduction – Related Technologies – Business Intelligence – E-Commerce and E-Business – Business Process Reengineering – Data Warehousing – Data Mining – OLAP – Product life Cycle management – SCM – CRM.

UNIT - II

ERP IMPLEMENTATION: Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams –Process Definitions – Vendors and Consultants – Data Migration – Project management – Post Implementation Activities.

UNIT - III

ERP IN ACTION & BUSINESS MODULES: Operation and Maintenance – Performance – Maximizing the ERP System – Business Modules – Finance – Manufacturing – Human Resources– Materials Management – Quality management – Marketing – Sales, Distribution and service.

UNIT - IV

ERP MARKET: Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software –Intuitive.

UNIT - V

ERP APPLICATION: Enterprise Application Integration – ERP and E-Business – Total quality Management – Future Directions – Trends in ERP.

TEXT BOOK

1. S. Sadagopan, "Enterprise Resource Planning", Tata McGraw Hill, 1999
2. Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill, 2000
3. Monk, E. F., Wagner, B. J. 2009, Concepts in Enterprise Resource Planning, 3rd edn, Course Technology Cengage Learning
4. Sumner, M. 2005, Enterprise Resource Planning, Pearson Education, Inc.
5. Ferran, C., and Salim, R. 2008, Enterprise Resource Planning for Global Economics: Managerial Issues and Challenges, Information Science References

REFERENCE BOOK

1. Vinod kumar Garg and N.K. Venkita Krishnan, "Enterprise resource planning" concepts and practice, 2nd edition, 2003.
2. Jyotindra Zaveri, "Enterprise resource planning", second edition – 2012.
3. Shtub, A. 1999, Enterprise Resource Planning (ERP): the Dynamics of Operations Management, Kluwer Academic Publishers.

ENTERPRISE RESOURCE PLANNING LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Basic Knowledge of Enterprise applications and activities.

AIM :

Enterprise Resource Planning (ERP) a group of integrated software modules used to run virtually all business processes in an organization. The course explains and demonstrates how business processes such as sales logistics, production/material management, procurement, and human resources are supported in an ERP software package.

OBJECTIVES :

The Object ive of this Course is to impart knowledge on :

1. Understand and communicate the need and examine the capabilities of an enterprise resource planning system.
2. Understand the importance of an integrated real time tasks and identify how the activities of each process contribute values to the organization
3. Understand and communicate the impact of events, activities, and transactions across the functions of an organization/ Industry.
4. Demonstrate and communicate the impact of integrated real-time information on the decision making process across various functional areas of an organization.
5. Gain hands-on experience on an enterprise resource planning environment and to develop the real time projects in an innovative manner.

OUTCOME :

After completion of the course the students are expected to be able to:

Implementation and design practices for business processes in Enterprise Resource Planning (ERP) systems. Course will examine and apply techniques used in SAP ECC for system configuration and integration with a focus on real time project/ product development accounting and logistics.

LIST OF PROGRAMS

1. Introduction to ERP
2. Introduction to Product lifecycle Management
3. To create a Requirements package system for an ERP
4. To develop an Accounting Information System
5. To build a Project assignment for Technical employees
6. To perform Product based Business Transactions and Financial Statements
7. To develop Procurement Cycle Management
8. To create an Inventory Management

T - SOCIAL NETWORK ANALYSIS AND MINING

3 2 0 3

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Aware about social network

AIM :

To Get through Knowledge in social network & Mining

OBJECTIVE :

The Objective of this Course is to impart knowledge on :

1. Understand the concept of semantic web and related applications.
2. Learn knowledge representation using ontology.
3. Understand human behavior in social web and related communities
4. Learn visualization of social networks

OUTCOMES:

After completion of the course the students are expected to be able to:

1. Develop semantic web related applications.
2. Represent knowledge using ontology.
3. Predict human behavior in social web and related communities.
4. Visualize social networks

UNIT- I

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

UNIT – II

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

UNIT- III

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi-Relational characterization of dynamic social network communities.

UNIT- IV

Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis - Trust transitivity analysis - Combining trust and reputation - Trust derivation based on trust comparisons -

UNIT- V

Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix representation - Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams - Hybrid representations - Applications - Cover networks - Community welfare - Collaboration networks - Co-Citation networks.

TEXT BOOKS

1. Peter Mika, "Social networks and the Semantic Web", Springer, First edition 2007.
2. Borko Furht, "Handbook of Social Network Technologies and Applications", Springer, 1st edition, 2010.

REFERENCE BOOKS

1. Guandong Xu , Yanchun Zhang and Lin Li, "Web Mining and Social
2. Networking – Techniques and applications", Springer, First edition, 2011.
3. Dion Goh and Schubert Foo, "Social information retrieval systems: emerging technologies and applications for searching the Web effectively", IGI Global snippet, 2008.
4. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, "Collaborative and social information retrieval and access: techniques for improved user modelling", IGI Global snippet, 2009.
5. John G. Breslin, Alexandre Passant and Stefan Decker, "The Social Semantic Web", Springer, 2009.

SOCIAL NETWORK ANALYSIS AND MINING LAB

0 0 3 2

(For Students admitted from 2014 onwards)

PRE-REQUISITE :

Aware about social network

AIM :

To Get through Knowledge in social network & Mining

OBJECTIVE :

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OUTCOMES:

After completion of the course the students are expected to be able to:

1. Develop semantic web related applications.
2. Represent knowledge using ontology.
3. Predict human behavior in social web and related communities.
4. Visualize social networks

LIST OF EXPERIMENTS

1. Working with basic R Commands.
2. Importing data into R
3. Working with math functions in R
4. Draw Simple and multiple graphs in R.
5. Do theStatistical test in R for a social network data.
6. Apply Sorting & for and while loop in R
7. Mining social network data for sentimental analysis using RSTUDIO.
8. Mining twitter data for business analysis using RSTUDIO.
9. Mining online social network using rstudio.
10. Calculating and visualizing network metrics using nodexl