

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION

BE (Information Technology) III Semester

Sl. No.	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Appl. Mathematics	333351(14)	Mathematics-III	4	1	-	80	20	20	120	5
2	Appl. Mathematics	333352(14)	Discrete Structures	3	1	-	80	20	20	120	4
3	Info. Technology	333353(33)	Basic Electronics & Network Theory	3	1	-	80	20	20	120	4
4	Info. Technology	333354(33)	Concepts of IT & Web Technology	3	1	-	80	20	20	120	4
5	Info. Technology	333355(33)	Problem Solving & Logic Building using C	3	1	-	80	20	20	120	4
6	Info. Technology	333356(33)	Digital Electronics and Logic Design	3	1	-	80	20	20	120	4
7	Info. Technology	333361(33)	Basic Electronics & Network Theory Lab	-	-	3	40	-	20	60	2
8	Info. Technology	333362(33)	Problem Solving & Logic Building using C Lab)	-	-	3	40	-	20	60	2
9	Info. Technology	333363(33)	Digital Electronic and Logic Design Lab	-	-	3	40	-	20	60	2
10	Info. Technology	333364(33)	Web Technology Lab (HTML / DHTML/CSS/XML)	-	-	3	40	-	20	60	2
11	Humanities	333365(46)	Value Education	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	-	-
			TOTAL	19	6	15	640	120	240	1000	34

*L: Lecture, T: Tutorial, P: Practical, ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment
Note: Duration of all theory papers will be of Three Hours.*

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	Bachelor of Engineering	Semester:	III
Branch:	Information Technology	Code:	333351(14)
Subject:	Mathematics – III	Total Tutorial Periods:	10
Total Theory Periods:	40	Assignments:	Two (Minimum)
Class Tests:	Two (Minimum)	Maximum Marks: 80	Minimum Marks: 28
ESE Duration:	Three Hours		

Course Objectives:

1. To make the students understand the Fourier series analysis is a powerful method where the formulas are integrals and to have knowledge of expanding periodic functions that explore variety of applications of Fourier series.
2. To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differential equations.
3. To provide a sound background of complex analysis to perform a thorough investigation of major theorems of complex analysis and to apply these ideas to a wide range of problems that includes the evaluation of both complex line integrals and real integrals.
4. To have a thorough knowledge of PDE which arise in mathematical descriptions of situations in engineering.
5. To study about a quantity that may take any of a given range of values that can't be predicted as it is but can be described in terms of their probability.

UNIT- I Fourier series: Expansion of function as Fourier series, Change of interval, Even and odd functions, Half-range Fourier series, Practical harmonic analysis.

UNIT-II Laplace Transformation: Laplace transform of elementary functions, Properties of Laplace transform, Laplace transform of derivatives and integrals, multiplication by t^n and division by t , Laplace transform of periodic functions. Inverse Laplace transform, Convolution theorem, Application of Laplace transform to solutions of ordinary differential equations.

UNIT- III Theory of Complex Variables: Limit, Derivative and Analytic functions; Cauchy-Riemann equations and its applications to flow problems; Complex Integration: Line and Contour integral, Cauchy integral theorem and Integral formula; Taylor series, Laurent series; singularities; Poles and their orders and residues; Evaluation of real definite integrals.

UNIT-IV Partial Differential Equation: Formation of partial differential equations, Equations solvable by direct integration, Lagrange's linear equations, Homogeneous linear differential equations with constant coefficients, Non-homogeneous linear equations, Solution of partial differential equations by the method of separation of variables.

UNIT-V Random variable: Discrete and continuous probability distributions, Mathematical expectation, Mean and Variance, Moments, Moment generating function, probability distribution, Binomial, Poisson and Normal distributions.

Text Books:

1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.

Reference Books:

1. Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan, Pune.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

COURSE OUTCOME:

After completion of this course the students will be able to apply Fourier series, Laplace transformation, Theory of complex variable, Partial differential equations and Random variable to Computer Science problems and solve them. Hands on these Mathematical topics will make them equipped to prepare for higher studies through competitive examinations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	Bachelor of Engineering	Semester:	III
Branch:	Information Technology	Code:	333352(14)
Subject:	Discrete Structures	Total Tutorial Periods:	10
Total Theory Periods:	40	Assignments:	Two (Minimum)
Class Tests:	Two (Minimum)	Maximum Marks: 80	Minimum Marks: 28
ESE Duration:	Three Hours		

Course Objectives:

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

UNIT- I MATHEMATICAL LOGIC & BOOLEAN ALGEBRA: Basic concept of mathematical logic, Statements, Connectives, Conditional and biconditional statements, Logical equivalence, Logical implication & quantifiers, Basic concept of Boolean Algebra, Properties of Boolean Algebra, Boolean functions, Disjunctive & conjunctive normal forms of Boolean functions, Applications of Boolean Algebra in switching circuits & logic circuits.

UNIT-II SET THEORY, RELATIONS, FUNCTIONS: Basic concept of set theory, Relations, Properties of relation in a set, Equivalence relation, Composition of relations, Partial order & total order relations, Lattices & Hasse diagram, Introduction to function, Inverse, Identity, Injective, Surjective & Bijective functions, Composition of functions and some special functions.

UNIT- III ALGEBRAIC STRUCTURES: Groups, Subgroups, Cosets, Lagrange's theorem, Isomorphism, Automorphism, Homomorphism, Codes & group codes, Rings, Integral domains and Fields.

UNIT-IV GRAPH THEORY: Introduction to graph theory, Walks, Paths & Circuits, Types of graphs, Shortest path problems, Eulerian and Hamiltonian graphs, Basic concept of tree: spanning tree, minimum spanning tree, search tree, rooted binary tree, Cut sets, Network flow, Matrix representation of graphs.

UNIT-V COMBINATORICS: Permutation and combination, Pigeon-hole principle, Mathematical induction, Principle of Inclusion and Exclusion, Generating function, Recurrence relation.

Text Books:

1. Elements of discrete mathematics by C.L. Liu, Tata McGraw-Hill, publications.
2. Discrete Mathematical structures, by Bernard Kolman, Robert C. Busby and Sharon Cutler Ross, Pearson Education.

Reference Books:

1. A Text Book of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand & Company Ltd.
2. Graph theory with applications to engineering and computer science, by NarsinghDeo, Prentice Hall of India.
3. Discrete mathematics for computer scientists and mathematicians, by J.L. Mott, A. Kandel and T.P. Baker, Prentice Hall of India.
4. Discrete Mathematical Structures with applications to computer science, by J.P. Tremblay and R. Manohar, Tata McGraw-Hill.

COURSE OUTCOME:

After completion of this course students will be -

1. Able to apply mathematical logic and Boolean algebra in switching circuits & logic circuits.
2. Familiar with set theory, relation and functions.
3. Familiar with algebraic structures, graph theory and combinatorics.
4. Able to solve problems in various fields in computer science, specially networking.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	Bachelor of Engineering	Semester:	III
Branch:	Information Technology	Code:	333353(33)
Subject:	Basic Electronics & Network Theory		
Total Theory Periods:	40	Total Tutorial Periods:	10
Class Tests:	Two (Minimum)	Assignments:	Two (Minimum)
ESE Duration:	Three Hours	Maximum Marks:	80
		Minimum Marks:	28

Course Objectives:

1. To understand basic electrical networks, associated circuit theorems.
2. To develop an idea about the semiconductor electronic devices which play very important role in field of computer hardware design which are frequently used in our day to day life.
3. To motivate our students to develop a sound foundation for forthcoming electronics subjects that are based on computer hardware and communication devices.
4. To learn the basic elements and working principles of Field Effect Transistor & its utilization in electronics circuits.

UNIT- I Basics of Networks: Circuit Elements, KVL, KCL, Network Theorems, Superposition, Thevenin's, Norton's, Max. Power Transfer Reciprocity, Network theorems and their applications in circuit analysis, Formulation of network equations, Source transformations, Two port networks, Open circuit Impedance and Short circuit Admittance parameters, hybrid parameters, and their inter-relations.

UNIT-II Diode and Its Applications: Diodes; Semiconductor Diodes, V-I Characteristics, Effect of Temperature on V-I Characteristics, Ideal Diode, Diode equation, Diode Resistance, Diode Capacitance: Transition and Diffusion Capacitance. Rectifying circuits and DC Power Supplies: Load line analysis of diode circuit, Half wave rectifier: Voltage regulation, Ripple factor, ratio of rectification, Transformer Utilization factor. Full wave rectifier, Bridge rectifier. Filter circuits for power supply: Inductor filter, Capacitor filter. Zener diode: Break down mechanism, Characteristics, Specifications, Voltage regulator circuit using zener diode.

UNIT- III Transistors: Transistor: Introduction, Construction, Types: npn and pnp, Current components. Transistor as an amplifier, Transistor Characteristics, Transistor Circuit Configuration: Common Base (CB) Configuration, Common Emitter (CE) Configuration, Common Collector Configuration (CC), Early Effect. Ebers-Moll Model, Maximum Voltage Ratings.

UNIT-IV Stability of Transistors: Transistor Biasing and Thermal stabilization: The operating point, Bias stability, Stability factor, Emitter bias, Collector – to – base bias, Voltage divider bias with emitter bias, Emitter bypass capacitor. Bias compensation.

UNIT-V Field Effect Transistors: Field Effect Transistor (FET): Introduction, Construction, Operation, V-I Characteristics, Transfer Characteristics, Drain Characteristics, Small-Signal Model. Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Introduction, Construction, Operation and characteristics, Depletion MOSFET, Enhancement MOSFET.

Text Books:

1. Integrated Electronics: Analog & Digital Circuit Systems – Jacob Millman&Halkias, TMH.
2. Network Analysis by M.E. Van Valkenbarg,

Reference Books:

1. Electronic Devices and Circuit Theory – Boylestad&Nashelsky, 8th Ed. PHI.
2. Electronic Devices & Circuit Analysis – K. Lal Kishore, BS Publications
3. Electronic Devices & Circuits – Allen Mottershead, PHI.
4. Circuit Theory Analysis & Synthesis by A Chakraborty (DhanpatRai& Co. Pvt. Ltd, New Delhi)

COURSE OUTCOME:

1. Students will be able to acknowledge about the fundamental of semiconductor devices, communication hardware devices and basics of computer hardware.
2. They will learn about the different electronics circuits which play very important role in our day to day life.
3. Recognize basic electronics components and devices used for different electronic functions.
4. Be able to design analog and digital electronic circuits at block level.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	Bachelor of Engineering	Semester:	III
Branch:	Information Technology	Code:	333354(33)
Subject:	Concepts of IT & Web Technology		
Total Theory Periods:	40	Total Tutorial Periods:	10
Class Tests:	Two (Minimum)	Assignments:	Two (Minimum)
ESE Duration:	Three Hours	Maximum Marks: 80	Minimum Marks: 28

Course Objectives:

1. To provide students basic ideas regarding computer as a functional system.
2. To provide knowledge about the hardware and the software components of a computer system
3. To familiarize with the concept of internet and its applications
4. To skill them with professional knowledge of desktop publishing practices using different types of software packages.

- UNIT- I COMPUTER FUNDAMENTALS:**Brief history of computers, Technical evolution of computers, Computer pioneers, Categories / types of computers, Computer hardware, Computer software, CPU and its components; Mother board, Microprocessor, Expansion slots, Input / Output ports, Memory; Types of computer memory, Memory modules viz. SIMM, DIMM, EDO, RDRAM, SDRAM, DDR RAM, etc. Communication pathways, Computer registers.
- UNIT-II INPUT, OUTPUT (HARD/SOFT) COPY DEVICES, STORAGE DEVICES:**Input concepts, Input devices viz. Keyboard, Mouse, Joystick, Track ball, Touch screen, Light pen, MICR, OMR, OBR, OCR, Voice input, Smart cards, Bar code readers, Digitizer, Scanner, etc. Graphic display devices: DVST, Graphical input devices, three dimensional input devices; Voice output systems. Hard copy devices viz. Printer, Types of printers, Features of printers; Plotter, Types of plotters, Features of plotters; Types of cards (brief) viz. CGA, MGA/MDA, EGA, VGA, SVGA, etc. Storage devices viz. Fixed disk or Hard disk, Floppy diskette. Types of monitors: CRT Monitor, color monitor, LCD, LED, PLASMA displays.
- UNIT- III OPERATING SYSTEMS AND MS-DOS :**Functions of operating system (only list), Boot loader (Windows and Unix) Compiler, Assembler, Interpreter, Debugger, Loader, and Linker; Machine language, Assembly language, High level languages, Fourth generation languages; Booting process (with BIOS & POST), Auto executing programs, Setting parameters of config.sys; Internal and external commands of MS-DOS along with their syntax and different options.
- UNIT-IV HTML:** Introduction to HTML, SGML, DTD (Document Type Definition), Basic HTML Elements, Tags and usages, HTML Standards, Issues in HTML.
DHTML: Introduction Cascading Style Sheets: Syntax, Class Selector, Id Selector, DOM (Document Object Model) & DSO (Data Source Object).
- UNIT-V SOFTWARE PACKAGES:**
Electronic Spreadsheet, Word processing software, other pre-written software packages, Data communication packages, Desktop publishing standards and practices, Introduction to Open Source Software.

Text Books:

1. Information Technology Today, S. Jaiswal, Revised Edition, Galgotia.
2. Computers Today, S. K. Basandra, Updated Edition, Galgotia.

Reference Books:

1. ISTE Learning Material, Computer Installation and Trouble Shooting, M. Radhakrishnan, D.Balasubramaniam
2. CHIP Special, Basics in Computing, www.chip-india.com
3. Microsoft MS-DOS User's guide(manual), Version 6.2 or above. Getting started Microsoft Windows(manual), 98 or higher version.

1. **COURSE OUTCOME:** Able to identify thrust areas of computer usage, how computers work, and gain basic knowledge of technological trends, social issues, and career opportunities relative to computers in society.
2. Acquaint with proper up-keep of computer processor, its peripherals, and storage media.
3. Able to use the knowledge of the Windows operating system and Windows explorer as well as how to perform essential functions using a graphical user interfaces.
4. Able to implement the knowledge of DTP using special features of word processors, electronic spreadsheets & software and create professional-looking documents through record keeping, data manipulation, number-crunching and charting activities in lab exercises and assignments.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Problem Solving & Logic Building using C**

Semester: **III**
Code: **333355(33)**

Total Theory Periods: **40** Total Tutorial Periods: **10**
Class Tests: **Two (Minimum)** Assignments: **Two (Minimum)**
ESE Duration: **Three Hours** **Maximum Marks: 80** **Minimum Marks: 28**

Course Objectives:

1. To differentiate and understand low-level and high-level programming languages
2. To understand modular programming concepts
3. To understand the use of rich set of data types in C appropriate to specific programming problems.
4. Demonstrate the use of various operators
5. Demonstrate the use of the various control flow constructs.
6. Use arrays & pointers to efficiently to design C program to solve problems.
7. Demonstrate creation and use of own data types.

- UNIT- I** Introduction: Computer systems, Hardware & software concepts.
Problem Solving: Algorithm / pseudo code, flowchart, program development steps, Computer Languages: machine, symbolic, and high -level languages, Creating and running programs: Writing, editing, compiling, linking, and executing.
Basics of C: Structure of a C program, identifiers, basic data types and sizes. Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation, Sample programs.
- UNIT-II** Bit-wise Operators: logical, shift, rotation, masks.
Selection – Making Decisions: Two - way selection: if - else, null else, nested-if, examples, Multi- way selection: switch, else-if, examples.
Strings: concepts, C strings.
Iterative: Loops -while, do-while and for statements, break, continue, initialization and updating, event and counter controlled loops, looping applications: Summation, powers, smallest and largest.
- UNIT- III** Arrays: Arrays-concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1-D arrays, 2-D arrays and character arrays, string manipulations, multidimensional arrays, array applications: Matrix Operations, checking the symmetry of a Matrix.
Functions -Modular programming: Function basics, parameter passing, storage classes (extern, auto, register, static), scope rules, block structure, user defined functions, standard library functions, recursive functions. Recursive solutions for Fibonacci series and Towers of Hanoi. Header files, C pre-processor. Examples C programs on Passing 1-D arrays and 2-D arrays to functions.
- UNIT-IV** Pointers: Pointers concepts, initialization of pointer variables, pointers and function arguments, passing by address – dangling memory, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments.
- UNIT-V** Enumerated, Structure and Union: Derived types – structures, structure declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, program applications.
File Handling: Input and output – concept of a file, text files and binary files, Formatted I/O, file I/O operations, example programs.

Text Books:

1. “The C –Programming Language” by B.W. Kernighan, Dennis M. Ritchie, PHI “
2. “Programming in C” by E. Balagurusamy (TMH)

Reference Books:

1. “C Programming: A Problem - Solving Approach” by Forouzan, E. V. Prasad, Giliberg, Cengage, 2010.
2. “Programming in C” by Stephen G. Kochan, 3/e Pearson, 2000
3. “C Programming Laboratory Handbook For Beginners” by Sidnal, Wiley India.

Course Outcomes:

After completion of the course study, students will be able to-

1. Use and differentiate between basic concepts of computer hardware and software.
2. Use data representation for the fundamental data types in C and perform conversions between binary-hexadecimal-decimal data representations.
3. Read, understand and trace the execution of programs written in C language
4. Analyze problems and design algorithms in pseudo code.
5. Write C program for a given algorithm using modular approach

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	Bachelor of Engineering	Semester:	III
Branch:	Information Technology	Code:	333356(33)
Subject:	Digital Electronics & Logic Design		
Total Theory Periods:	40	Total Tutorial Periods:	10
Class Tests:	Two (Minimum)	Assignments:	Two (Minimum)
ESE Duration:	Three Hours	Maximum Marks:	80
		Minimum Marks:	28

Course Objectives:

1. To study various number systems, knowledge of these number systems is essential in core computer science subjects.
2. To explore brief idea about the different digital circuits which are used to develop the digital devices.
3. Understand the concepts of Memories, Programmable Logic Devices & Digital ICs.
4. To motivate the students to develop their logic to design new digital circuits usable for hardware design.
5. To motivate our students to use these digital circuits in integrated circuit design using VLSI.

UNIT-I Overview of Boolean algebra and Logic gates: Codes: Binary codes: Weighted & Non-weighted codes, Sequential codes, self complementing codes, Cyclic codes, 8-4-2-1 BCD code, Excess-3 code, Gray code: Binary to Gray and Gray to binary code conversion, Error detecting code, Error correcting code, 7-bit Hamming code, ASCII code, EBCDIC code. Binary Arithmetic, Boolean Algebra, Minimization of Switching Function, Demorgan's Theorem, Karnaugh's Map Method, Quine-McCluskey's Method (Tabular Method). Basic and Universal logic Gates, Realization of switching functions using gates.

UNIT-II Digital Logic Families: Transistor Inverter: Basic Concepts of RTL and DTL; TTL: Open collector gates, TTL subfamilies, IIL, ECL; MOS Logic: CMOS Logic, Dynamic MOS Logic, Interfacing: TTL to ECL, ECL to TTL, TTL to CMOS, CMOS to TTL, and Comparison among various logic families.

UNIT-III Combinational Circuits: Adder & Subtractor: Half adder, Full adder, Half-subtractor, Full-subtractor, Parallel Binary adder, Look Ahead carry adder, Serial adder, BCD adder. Code converter, Parity bit generator/Checker, Comparator. Decoder: 3-line to 8-line decoder, 8-4-2-1 BCD to Decimal decoder, BCD to Seven segment decoder. Encoder: Octal to binary and Decimal to BCD encoder. Multiplexer: 2-input multiplexer, 4-input multiplexer. Demultiplexer: 1-line to 4-line, study of Multiplexer as Universal Logic Function Generator.

UNIT-IV Sequential Circuits: Flip-Flops and their conversion, Excitation Tables. Introduction to registers and counters: Synchronous and Asynchronous counters and Designing of sequential circuits: code converter and counters. Mod-k and divide by K counters, Counter applications.

UNIT-V Memories and Machines: Finite State Machine, Mealy Machine, Moore Machine, Introduction to various semiconductor memories and designing of ROM and PLA & PAL.

Text Books:

1. R. P. Jain: "Modern Digital electronics", TMH
2. B. Somanathan Nair, "Digital Electronics & Logic Design", Prentice-Hall of India

Reference Books:

1. R J Tocci, "Digital System principles and Applications"
2. "Digital Electronics" by A.K. Maini, Wiley India.
3. M.M. Mano: "Digital design", PHI.
4. Millman Taub, "Pulse, Digital and Switching Waveforms" TMH
5. M.M. Mano: "Digital logic and computer design", PHI.
6. Floyd: "Digital fundamentals", UBS.

Course Outcomes:

After completion of this course, students will be able to -

1. Acknowledge about the fundamentals of digital circuit design.
2. Understand the operation of Latch circuits & Flip flops.
3. Take interest to designing & develop ICs in VLSI industries.
4. Learn operation of different Semiconductor Memories.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Basic Electronics & Network Theory
Laboratory**

Semester: **III**
Code: **333361(33)**

Total Lab Periods: **48**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. To draw the characteristics of a semi conductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
2. To draw the characteristics of a zener diode .
3. To design a half wave rectifier and to determine its efficiency and ripple factor.
4. To design a- full wave rectifier and determine the ripple factor and efficiency with and without filter.
5. To draw the characteristics of FET using BFW – 10.
6. To draw the characteristics of CE configuration of a transistor amplifier.
7. To draw the characteristics of CB configuration of a transistor amplifier.
8. To draw the characteristics of CC configuration of a transistor amplifier.
9. To design a Zener regulator circuit and to find the regulation characteristics.
10. To draw the load line of a transistor amplifier under CE configuration.
11. To design and verify the self bias circuit operation.
12. To design and verify the voltage divider biasing circuit.
13. To verify the effect of emitter bypass capacitor.
14. To calculate and verify "Z" parameters of a two port network.
15. To calculate and verify "Y" parameters of a two port network.
16. To calculate and verify "H" parameters of a two port network.

List of Equipments/Machines required:

Circuit components, Breadboard, Hook-up wire, Power supply, CRO, Function generator

Recommended Books:

1. Laboratory Manual for Electronic Devices and Circuits, 4 thEd., David A. Bell, PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Problem solving & Logic building using C
Laboratory**
Total Lab Periods: **48**
Maximum Marks: **40**

Semester: **III**
Code: **333362(33)**
Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Write a C program to take the radius of a sphere as input and print the volume and surface area of that sphere.
2. Write a C program to take a 5-digit number as input and calculate the sum of its digits.
3. Write a C program to take three sides of a triangle as input and verify whether the triangle is an isosceles, scalene or an equilateral triangle.
4. Write a C program that will take 3 positive integers as input and verify whether they form a Pythagorean triplet or not.
5. Write a C program to print all prime numbers between a given range of numbers.
6. Write a C program to define a function that will take an integer as argument and return the sum of digits of that integer
7. Write a C program to define a macro that can calculate the greater of two of its arguments. Use this macro to calculate the greatest of 4 integers.
8. Write a C program to define a recursive function that will print the reverse of its integer argument.
9. Write a C program to print the sum of first N even numbers using recursive function.
10. Write a C program to sort an array using Bubble sort technique.
11. Write a C program that will take the elements of two integer arrays of 5 element each, and insert the common elements of both the array into a third array (Set intersection)
12. Write a C program to take 5 names as input and print the longest name.
13. Write a C program to define a structure *Student* that will contain the *roll number*, *name* and *total marks* of a student. The program will ask the user to input the details of 5 students and print the details of all the students whose total marks is greater than a given value.
14. Write a C program to define a union *Contact* that will contain the members *Mobile no* and *E-mail id*. Now define a structure *Employee* that will contain *name*, *UID*, *PhNo*, *emailId* and a variable of type *Contact* as members. The program will ask the user to give the details of five Employees including contact details. Print the details of all the Employees.
15. Write a C program that will ask the user to input a file name and copy the contents of that file into another file.
16. Write a C program that will take any number of integers from the command line as argument and print the sum of all those integers.
17. Write a C program to process sequential file for payroll data.
18. Write a C program to process random file of library data.

REQUIRED SOFTWARE/ SOFTWARE TOOL:

- Linux Operating System and/ or Windows Operating System
- Turbo C/C++ IDE.

Recommended Book:

- 1) C Programming Laboratory by Dr. Nandini S. Sidnal, Wiley India, 2012

Chhattisgarh Swami Vivekanand Technical University, Bilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Digital Electronics and Logic Design
Laboratory**

Semester: **III**
Code: **333363(33)**

Total Lab Periods: **48**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. To study the characteristics and operations of TTL Inverters, OR, AND, NOR and NAND gate using ICs.
2. To study NAND and NOR gates as a universal logic.
3. To study and prove Demorgan's Theorem .
4. To design half and Full adder circuits using logic gates.
5. To design half and full subtractor circuits using logic gates.
6. To study the binary parallel adder.
7. To design 4 bit magnitude comparator circuits.
8. To study the 7 segment decoder.
9. To design 4:16 decoder using two 3:8 decoder and four 2:4 decoder
10. To design 16: 1 multiplexer using 4:1 Multiplexer.
11. To study various types of flip flops using logic gates and ICs.
12. To design Mod-N and divide by K counter.
13. To construct a 4 bit binary to gray converter and vice versa using IC 7486 .
14. To study Up-Down counter.
15. To study programmable shift registers.

List of Equipments /Machine Required:

- Logic gate trainer
- Digital ICs Trainer
- Various ICs 7400,7402,7404,7408,7432,7486,74138,74151,74155 etc.

Recommended Books:

M.M. Mano : "Digital Logic and Computer Design"

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Web Technology Laboratory**
Total Lab Periods: **48**
Maximum Marks: **40**

Semester: **III**
Code: **333364(33)**
Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. To Develop and demonstrate a XHTML document that illustrates the use external style sheet, ordered list, table, borders, padding, color, and the tag.
2. To Develop and demonstrate a XHTML file that includes JavaScript script for the following problems:
 - a) Input: A number n obtained using prompt, Output: The first n Fibonacci numbers
 - b) Input: A number n obtained using prompt, Output: A table of numbers from 1 to n and their squares using alert
3. To Develop and demonstrate a XHTML file that includes Javascript script that uses functions for the following problems:
 - a) Parameter: A string, Output: The position in the string of the left-most vowel
 - b) Parameter: A number, Output: The number with its digits in the reverse order
4. To Develop and demonstrate, using Javascript script, a XHTML document that collects the RollNo (the valid format is: A digit from 1 to 4 followed by two upper-case characters followed by two digits followed by two upper-case characters followed by three digits; no embedded spaces allowed- e.g. 1AB23CD356, 1GC13CS345) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected.
5. To Modify the above program to get the current semester also (restricted to be a number from 1 to 8)
6. To Develop and demonstrate, using JavaScript script, a XHTML document that contains three short paragraphs of text, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible.
7. To Modify the above document so that when a paragraph is moved from the top stacking position, it returns to its original position rather than to the bottom
8. To Design an XML document to store information about a student in an engineering college affiliated to CSVTU. The information must include RollNo, Name, Name of the College, Branch, Year of Joining, and e-mail id. Make up sample data for 5 students. Create a CSS style sheet and use it to display the document.
9. To Create an XSLT style sheet for one student element of the above document and use it to create a display of that element.
10. To Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.
11. To Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.
12. To Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.
13. To Write a Perl program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.
14. To Write a Perl program to display a digital clock which displays the current time of the server.
15. To Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.
16. To Write a PHP program to store current date-time in a COOKIE and display the "Last visited on" date-time on the web page upon reopening of the same page.
17. To Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.
18. To Create a XHTML form with Name, Address Line 1, Address Line 2, and E-mail text fields. On submitting, store the values in MySQL table. Retrieve and display the data based on Name.
19. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

List of Equipments/Machine/Software required:

Dual Core/Core I3 PC, Ubuntu/Fedora/Debian or any Open Source operating System, Mozilla Firefox/Netscape Navigator Web Browser.

Recommended Books:

1. HTML Complete Reference- Tata McGraw hill
2. HTML and XML: An Introduction NIIT, Prentice-Hall of India
3. Building Enhanced HTML Help with DHTML and CSS by Jeannine M.E.Klien. Pearson Education
4. HTML for the World Wide Web, Fifth Edition, with XHTML and CSS
5. Visual QuickStart Guide 5th Edition Elizabeth Castro, Pearson Education Sams Teach Yourself HTML & XHTML in 24 Hours 6th Edition Dick Oliver, Michael Morrison, Pearson Education

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Semester: **III**

Subject: **Value Education**

Code: **333365(46)**

No. Of Periods: **2 Periods/Week**

Total Tutorial Periods: **NIL**

Maximum Marks: 40

Minimum Marks: 24

Course Objectives:

1. This course is designed to provide the importance of education with why, what & how.
2. To impart students with an understanding of fundamental humanitarian viewpoint and its outcomes.
3. To provide the knowledge about whole existence and its impact on values.
4. To bring the awareness about life long exercise so that they can fulfill their responsibility towards themselves, the family, the society, the planet.

UNIT- I Aim of Education and Necessity for Value Education: Education in values/wisdom/etc and education in traits/technologies/etc as the two fundamental strands of education; Answer to the frequently asked questions such as “Why to do studies”, “What studies to do in overall”, “How to do studies in a proper way”, “How to think systematically and talk systematically”

UNIT-II Humanitarian Viewpoint and Basic Human Objective: Meaning and concept of happiness, Need for a fundamental viewpoint to judge things in all cases of human concerns, Proposal of the natural path of humanitarian coexistentialism; Consciousness development and its expression; Fundamental want of sustainable happiness in human being; Understanding the distinct activities and needs of self (I) and body in human being; Fundamental goal of human being; Sustainable-solution in individual (At the place of delusion); Sustainable-prosperity in family (At the place of poverty); Sustainable-cooperation in society (At the place of competition); Sustainable-coexistence in planet (At the place of struggle)

UNIT- III Elements of Holistic and Systematic Perspective: Need for study of fundamental information categories to develop holistic perspective; Particular-time actions and general-time laws; Need for fundamental information sequence to develop systematic perspective, Some examples for systematic study sequence

UNIT-IV Elements of Society-friendly and Environment-friendly Goals: Elements of Knowledge of whole existence; Elements of Knowledge of human being; Elements of fundamental Values and Wisdom; Value spectrum with reference to general relationships and particular relationships of the objects in nature; Elements of History and Contemporarity used to set current goals; Elements of Sciences and Techniques to formulate methods to achieve goals; Elements of Motoricity and Mattericity to make actions to execute the methods

UNIT-V Lifelong Exercise for All-round Sustainability: Collecting information for sustainability issues; Motivating people towards sustainable life-style; Ability to identify and develop appropriate technologies and management patterns for society-friendly and environment-friendly systems for production /protection/ utilization/ experimentation ; Ability to establish and execute the fundamental five-fold system in order to ensure sustainable peace-and-prosperity worldwide.

Text Books:

Value Education for Consciousness Development by Dr P B Deshmukh, Radha K Iyer, and Deepak K Kaushik (2nd Edition, 2012, ISBN: 978-81-924034-0-3)

Reference Books:

1. International Research Handbook on Values Education and Student Wellbeing by Terence Lovat, Ron Toomey, Neville Clement (Eds.), Springer 2010, ISBN: 978-90481-86747
2. Values Education and Lifelong Learning: Principles, Policies, Programmes by David N Aspin and Judith D Chapman (Eds.); Springer 2007, ISBN: 978-1-4020-6183-7
3. Fundamentals of Ethics for Scientists and Engineers by E G Seebaur and Robert L Berry, 2000, Oxford University Press

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of Teaching & Examination BE (Information Technology) IV Semester

Sl. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	ESE	CT	TA		
1	Appl. Mathematics	333451(14)	Computational Mathematics	4	1		80	20	20	120	5
2	Info. Technology	333452(33)	Telecom Switching & Computer Networks	3	1		80	20	20	120	4
3	Comp. Science & Engg.	333453(22)	Data Structures and Algorithm Analysis	3	1		80	20	20	120	4
4	Electronics & Telecom.	333454(28)	Analog Electronics Circuits	3	1		80	20	20	120	4
5	Info. Technology	333455(33)	Object Oriented Concepts & Programming using C++	3	1		80	20	20	120	4
6	Info. Technology	333456(33)	Computer Organization and Architecture	3	1		80	20	20	120	4
7	Info. Technology	333461(33)	Telecom Switching & Computer Networks Lab (NS-2/QUALNET/OPNET)			3	40		20	60	2
8	Info. Technology	333462(33)	Data Structures and Algorithm Analysis Lab			3	40		20	60	2
9	Electronics & Telecom.	333463(28)	Analog Electronics Circuits lab			3	40		20	60	2
10	Info. Technology	333464(33)	Object Oriented Concepts & Programming using C++ Lab			3	40		20	60	2
11	Humanities	333465(46)	Health , Hygiene and Yoga			2			40	40	1
12			Library			1					
			TOTAL	19	6	15	640	120	240	1000	34

L: Lecture, T: Tutorial, P: Practical, ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment

Note (1): Duration of all theory papers will be of Three Hours.

Note (2): Industrial Training of six weeks is mandatory for B.E. students. It is to be completed in two parts. The first part will be in summer after IV sem. after which students have to submit a training report which will be evaluated by the college teachers during B.E. V SEM.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Subject: **Computational Mathematics**

Semester: **IV**

Code: **333451(14)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. To provide knowledge of various methods for numerical solutions of algebraic and transcendental equations, simultaneous equation and ordinary differential equations.
2. To provide a thorough understanding of interpolation and numerical differentiation and integration.

- UNIT-I NUMERICAL SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:** Bisection Method, Regula-Falsi Method, Newton-Raphson Method, Secant Method, Birge-Vieta Method, Bairstow's Method.
- UNIT-II NUMERICAL SOLUTIONS OF SIMULTANEOUS LINEAR EQUATIONS:** Direct Methods - Gauss Elimination, Gauss-Jordan & Crout's Triangularisation Method. Iterative Methods - Jacobi's, Gauss-Siedal & Successive over Relaxation Method.
- UNIT-III INTERPOLATION WITH EQUAL AND UNEQUAL INTERVALS:** Finite differences, Newton's Forward & Backward Difference Formulae, Central Difference Formula, Stirling's Formula, Bessel's Formula, Lagrange's Formula and Newton's Divided Difference Formula,
- UNIT-IV NUMERICAL DIFFERENTIATION AND INTEGRATION:** Derivatives using Forward, Backward and Central Difference Formulae. Newton-Cote's Quadrature Formula, Trapezoidal rule, Simpson's rules, Weddle's rule.
- UNIT-V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS:** Picard's Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Runge-Kutta Methods, Predictor-corrector Methods- Milne's Method, Adams-Bashforth Method.

Text Books:

1. Numerical Methods in Engineering and Science by Dr. B.S. Grewal, Khanna Publishers.
2. Numerical Methods for Scientific and Engineering Computation by M .K. Jain, S. R. K.

Reference Books:

1. Numerical Methods for Scientists and Engineers by K. Shankar Rao, Prentice Hall of India.
2. Numerical Methods with C++ Programming, by Somasundaram & Chandrasekaran, Prentice Hall of India.
3. Numerical Methods, by S. S. Shastri, Prentice Hall Inc. India 1998.
4. Iyengar & R. K. Jain, Wiley Eastern Limited.

Course Outcome:

After completion of this course students will be able to find Numerical solution of various equations, which may be arising due to mathematical modelling based on engineering problems.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Semester: **IV**

Subject: **Telecom Switching & Computer Networks**

Code: **333452(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. To explore basics idea about the networking and its applications.
2. To motivate students so as to identify and design computer network according to their need.
3. To develop an idea about working of telephone exchange and cable technology.
4. To develop an idea for secure data communication on networks.

UNIT-I TELEPHONY & CABLE TECHNOLOGY: Basic concept of telephony system & topology, Framing, Multiplexing, Flow/ Error control, Multiple access, Circuit / Packet switching, Addressing / Routing, Subscriber loop system, switching hierarchy and routing, PSTN, ISDN, DSL, ADSL. Cable technologies.

UNIT-II COMPUTER NETWORK: Introduction, Perspective of network, protocols and standard, Network Topologies, Transmission Mode, categories of network; LAN, MAN, WAN, OSI Model, Functions of the layer, TCP/IP Protocol suit, Link Configuration, Asynchronous and Synchronous mode. Physical layer: Digital data transmission, DTE-DCE Interface, other Interface Standard, V.24 Null Modem, Modem Standards, cable Modem, Transmission Media, Data Link layer: Types of Errors, Error Detection and Correction Methods, Flow Control, HDLC, Brief Details of Data Link Protocols.

UNIT- III LOCAL AREA NETWORK & UPPER LAYERS: Aloha, slotted aloha IEEE 802 Standards; IEEE 802.1, LLC, MAC, PDU, ETHERNET: Access method, addressing, Frame Format, Implementation, Switched Ethernet, Fast Ethernet, Gigabit Ethernet, Token Bus, Token Ring, FDDI, OSI layers: Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer, Networking and Internetworking devices :Overview of repeaters, Bridges, routers, Gateways, Hubs. TCP: TCP Services, TCP Header Format, FTP, SMTP, HTTP.

UNIT-IV EXAMPLE NETWORKS & ROUTER DESIGN:Switched packet & data services, concept of ingredient, X.25, Frame relay, ISDN,ATM network, ATM signaling and PNNI routing, ATM traffic management, IP overATM to MPLS, Decoupling, Introduction to traffic engineering, high speed routerdesign.

UNIT-V CRYPTOGRAPHY & DIGITAL SIGNATURE: Cryptography: Encryption; Decryption; Cryptogram (cipher text); Single key (Secret key); Cryptography; two key (Public key) cryptography; Single key cryptography; The data Encryption Standard; Public Key Cryptography; Diffie-Hellmann public key distribution; The Rivest- Shamir Adelman(R-S-A) system for public key cryptography; Digital Signature, Certification authority.

Text Books:

1. Data Communication & Networking by Behrouz A. Forouzan.
2. Data and Computer Communication by William Stalling (Pearson Education)
3. Computer Networks by Andrew S.Tanenbaum

Reference Books:

1. Computer Networking by Ed Tittel (Schaum's series) (TMH)
2. Cryptography and Network Security by Atulkahate (TMH)
3. Telecom Switching system & Networking by Thiagrajanviswanathan (PHI)

Course Outcomes:

1. Students will be able to acknowledge about the working of telephone exchange and cable technology.
2. They will learn about concepts of networks and its basic components.
3. They will be in condition to identify different types of computer networks and protocols used.
4. They will be able to explain different types of networks are in use and how to communicate securely using them.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Semester: **IV**

Subject: **Data Structures & Algorithm
Analysis**

Code: **333453(22)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. Demonstrate familiarity with major algorithms and data structures
2. Analyse performance of algorithms.
3. To teach the data organization and types of data structures.
4. To make the students learn about the basic operations on linear and non-Linear data structures and the internal memory mappings for all types of data structures.
5. Determine which algorithm or data structure to use in different scenarios.
6. Be familiar with writing recursive methods

UNIT-I Algorithm Analysis: Analyzing algorithms, Algorithm types, Recurrence Equations, Growth function: Asymptotic notation, Standard notation & common functions, Recurrence relation, different methods of solution of recurrence equations with examples. Representation and Mapping of Arrays in Memory, Matrices: Polynomial Arithmetic, Sparse Matrices and its Transpose computation methods, Performance Analysis.

UNIT-II Linear Data Structures: Stacks: Array Representation, Nested Arithmetic Expression: Polish Notation and Conversions, Recursion, Queues: Array Representations and Boundary Parameters, Circular Queues, D-Queues, Priority Queues. Singly Linked List: Representation in Memory, Traversing, Searching, Memory Allocation, Garbage Collection, Insertion into a linked list, Deletion from a linked list, Header Linked List, Polynomial Arithmetic, Circular Linked List, Operations on Doubly Linked List: traversing, Searching, Deleting, Inserting. Linked Representation of Stacks and Queues.

UNIT-III Sorting and Searching: Insertion, Selection, Bubble sort methods, Divider and conquer: Quick sort, Merge Sort, Shell sort & Radix sort, Comparison of various sorting techniques. **Searching Techniques:** Sequential search, Binary search, Comparison trees, Performance Comparison of searching algorithms, **Hashing:** Hash Function- Open and Closed Hashing, Hash collisions, Rehashing techniques, Extendible hashing.

UNIT-IV Binary Trees: Terminologies, Representation of binary Trees: Using Arrays and linked lists, Binary Tree Traversals: Recursive and Non-Recursive techniques, Threaded Binary trees, Binary search tree operations: Traversal, Searching, Inserting and Deleting elements; AVL search tree operations: Insertion and Deletion, m-way search tree, Searching Insertion and Deletion in an m-way search tree, Searching, Insertion and Deletion in a B- tree, Heap Sort.

UNIT-V Graphs: Terminologies, Representation of Graphs: Adjacency Matrices and Adjacency lists, Warshall's algorithm: Path Matrix computation and Shortest Paths, Graph operations: Traversal, Searching (depth-first and Breadth-first), Topological Sorting, spanning tree computation, minimum spanning trees.

Text Books:

1. Data Structure by Seymour Lipschutz & G. a. VijayalakshmiPai(Schaum's outlines).
2. Data Structures using C/C++ by Langsam, Augenstein & Tananbaum(PHI).
3. Data Structures & Program Design by Robert L Kruse (PHI)

Reference Books:

1. Data Structure using C & C++ by Rajesh Shukla, Wiley India.
2. An Introduction to Data Structures with Application by Tremblay & Sorenson (Tata Mc)
3. Data Structures using C by ISRD Group (Tata Mc)
4. Classic Data Structure by D Samanata, Prentice-Hall of India.
5. Expert Data Structures with C (2nd Editin) by R.B. Patel , Khanna Publishing House.

Course Outcomes:

After successful completion of this course, the students will be able to-

1. Understand the performance issues involved in computing algorithm time-complexities.
2. Understand and implement basic data structures such as arrays, lists, trees, stacks, queues, binary search trees etc.
3. Get the knowledge of the data structures and algorithms on which file structures and data bases are based.
4. Obtain hands-on experience of algorithmic design and implementation through practical sessions of the subject.
5. Implement various searching and sorting algorithms
6. Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Subject: **Analog Electronics circuits**

Semester: **IV**

Code: **333454(28)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. To explore basics idea about the communication devices that play very important role in the field of communication.
2. To motivate students to develop a sound foundation for forthcoming communication subjects.
3. To take an initiative to develop analog electronics simulator, which can be utilizes for simulation laboratory work for college students.
4. To learn about all oscillator circuits, utilization of devices in communication devices.

UNIT-I LOW FREQUENCY TRANSISTOR AMPLIFIER: Graphical Analysis of CE amplifier; h-parameter Models for CB, CE, CC configurations and their Interrelationship; Analysis and Comparison of the three Configurations; Linear analysis of Transistor Circuits: Miller's Theorem: Cascading: Simplified Models and Calculation of CE and CC Amplifiers; Effect of emitter Resistance in CE amplifiers: Cascade amplifiers: Darlington Pair.

UNIT-II HIGH FREQUENCY TRANSISTOR AMPLIFIERS: CE hybrid- π model: Validity and parameter Variation: Current Gain with Resistive load: frequency response of a single stage CE Amplifier: Gain-Bandwidth product: CC stage High frequencies.

UNIT-III MULTISTAGE AMPLIFIERS: Classification: Distortion in Amplifiers: Frequency Response: Bode plots: Step Response: pass band of Cascaded Stages: Response of a Two-stage RC Coupled Amplifier at Low and high frequencies: Multistage amplifiers: Sources of Noise in Transistor Circuits: Noise Figure.

UNIT-IV FEEDBACK AMPLIFIERS: Classification: Feedback concept; Ideal Feedback amplifier: Properties of Negative Feedback Amplifier Topologies: Method of Analysis of Feedback amplifiers: Voltage series Feedback: Voltage series Feedback pair: Current series, Current shunt and Voltage shunt feedback; Effect of feedback on amplifier Bandwidth and stability.

UNIT-V OSCILLATOR: Sinusoidal oscillator: phase shift oscillators, Wien Bridge oscillator: Resonant circuit oscillators: LC Collpit & LC Hartley, Amplitude Frequency and phase stability analysis of all Oscillators, General form of Oscillator Configuration; Crystal oscillator.

Text Books:

1. Integrated Electronics – Millman & Halkias, TMH.
2. Microelectronics – Millman and Grabel, TMH.

Reference Books:

1. Electronic Devices & Circuits – David A. Bell, PHI
2. Microelectronics – B. Razavi

Course Outcomes:

After completion of this course students will be able to -

1. Possess knowledge about the fundamental communication devices like amplifiers and oscillator and their importance in communications.
2. Understand design considerations of these devices according to specific applications.
3. Understand the amplitude and frequency responses of common amplification circuits.
4. Develop the ability to analyze and design analog electronic circuits using discrete components.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Subject: **Object Oriented Concepts & Programming using C++**

Semester: **IV**

Code: **333455(33)**

Total Theory Periods: **40**

Class Tests: **Two (Minimum)**

ESE Duration: **Three Hours**

Total Tutorial Periods: **10**

Assignments: **Two (Minimum)**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. Understand object-oriented programming features in C++,
2. Apply these features to program design and implementation,
3. Understand object-oriented concepts and how they are supported by C++,
4. Understand implementation issues related to object-oriented techniques,
5. Build good quality software using object-oriented programming technique

UNIT-I Object-Oriented Programming Concepts: Introduction, comparison between procedural programming paradigm and object-oriented programming paradigm, basic concepts of object-oriented programming — concepts of an object and a class, interface and implementation of a class, operations on objects, relationship among objects, abstraction, encapsulation, data hiding, inheritance, overloading, polymorphism, messaging.

UNIT-II Standard Input/Output: Concept of streams, hierarchy of console stream classes, input/output using overloaded operators >> and << and member functions of i/o stream classes, formatting output, formatting using ios class functions and flags, formatting using manipulators. **Classes and Objects:** Specifying a class, creating class objects, accessing class members, access specifiers, static members, use of *const* keyword, friends of a class, empty classes, nested classes, local classes, abstract classes, container classes, bit fields and classes.

UNIT-III Pointers and Dynamic Memory Management: Declaring and initializing pointers, accessing data through pointers, pointer arithmetic, memory allocation (static and dynamic), dynamic memory management using *new* and *delete* operators, pointer to an object, *this* pointer, pointer related problems - dangling/wild pointers, null pointer assignment, memory leak and allocation failures. **Constructors and Destructors:** Need for constructors and destructors, copy constructor, dynamic constructors, explicit constructors, destructors, constructors and destructors with static members, initializer lists.

UNIT-IV Operator Overloading and Type Conversion: Overloading operators, rules for overloading operators, overloading of various operators, type conversion - basic type to class type, class type to basic type, class type to another class type. **Inheritance:** Introduction, defining derived classes, forms of inheritance, ambiguity in multiple and multipath inheritance, virtual base class, object slicing, overriding member functions, object composition and delegation, order of execution of constructors and destructors.

UNIT-V Virtual functions & Polymorphism: Concept of binding - early binding and late binding, virtual functions, pure virtual functions, abstract classes, virtual destructors. **Exception Handling:** Review of traditional error handling, basics of exception handling, exception handling mechanism, throwing mechanism, catching mechanism, rethrowing an exception, specifying exceptions. **Templates and Generic Programming:** Template concepts, Function templates, class templates, illustrative examples. **Files:** File streams, hierarchy of file stream classes, error handling during file operations, reading/writing of files, accessing records randomly, updating files.

Text Books:

1. Lafore R., Object Oriented Programming in C++, Waite Group.
2. E. Balagurusamy, Object Oriented Programming with C++, Tata McGraw Hill.

Reference Books:

1. R. S. Salaria, Mastering Object-Oriented Programming with C++, Salaria Publishing House.
2. Bjarne Stroustrup, The C++ Programming Language, Addison Wesley.
3. Herbert Schildt, The Complete Reference to C++ Language, McGraw Hill-Osborne.
4. Lippman F. B, C++ Primer, Addison Wesley.
5. R. S. Salaria, Test Your Skills in Object-Oriented Programming With C++, Salaria Publishing House.

Course Outcomes:

1. Knowledge and Understanding- At the end of a course the student will understand the concepts of:
 - a) Variables, data Types (including strings and arrays) and Expressions
 - b) Flow of Control
 - c) Functional and procedural abstraction and its importance in good program design
 - d) Pointers and memory allocation (static and dynamic)
 - e) Iteration and Recursion
2. Skills - At the end of the course, a student will be able to:
 - a) Analyse a simple programming problem specification
 - b) Design a high-level (programming language independent) solution to the problem using functional abstraction and general imperative programming language constructs.

Write, compile, execute and debug a C++ program which maps the high-level design onto concrete C++ programming constructs

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Computer Organization & Architecture**

Semester: **IV**
Code: **333456(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Class Tests: **Two (Minimum)**

Assignments: **Two (Minimum)**

ESE Duration: **Three Hours**

Maximum Marks: 80 Minimum Marks: 28

Course Objectives:

1. To have a thorough understanding of the basic structure and operation of a digital computer.
2. To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
3. To study the different ways of communicating with I/O devices and standard I/O interfaces.
4. To study the hierarchical memory system including cache memories and virtual memory.

UNIT-I BASIC COMPUTER ORGANIZATION AND DESIGN: Computer Organization and Architecture: Introduction, Machine Language Milestone in Computer Architecture, Interconnection Structure: Bus Interconnection, MAR, MBR, PC, IR, PCI. Data Path of Von Neumann Machine, Instruction Code, Decoding and Execution. The Fetch Decode Execute Cycle: Example, Instruction Formats, Stack Organization, Addressing Modes.

UNIT-II ARITHMETIC PROCESSING DESIGN: Fixed-Point Arithmetic- Addition and Subtraction: addition and subtraction with Signed- Magnitude Data, Hardware Implementation, Hardware Algorithm, addition and subtraction with Signed- 2's Complement Data. Multiplication Algorithm: Hardware Implementation, Hardware Algorithm, Binary Multiplication, Booth Multiplication Algorithm. Division Algorithm, Floating-Point Arithmetic Operations: Basic Considerations, Register Configuration, Addition, subtraction, Multiplication & Division.

UNIT- III CONTROL UNIT ORGANIZATION: The Control Unit: Type of control unit, Control Unit Function, Control Unit Operation, Hardwired Control Unit- Basic Concept, Advantages, Disadvantages. Micro- Programmed Control Unit- Basic Concept, Advantages, Disadvantages. Difference between Hardwired Control Unit and Micro-Programmed Control Unit, Control Memory, Address Sequencing.

UNIT-IV STORAGE AND MEMORY HIERARCHY: Basic Concept and Terminology, Memory Hierarchy, Semiconductor Memories- RAM and ROM Chips, Memory Address Mapping, Memory connected to CPU. Memories and Interleaving- Virtual memory, Cache memories, Cache memory working principles, Cache coherence issues, Cache performance analysis. Memory Management Hardware Requirements.

UNIT-V INPUT/OUTPUT ORGANIZATION: Programmed I/O, I/O Addressing, I/O instruction, Synchronization, I/O Interfacing, Interrupt Mechanism, DMA, I/O Processors and Data Communication. Introduction to Pipelining: Linear and Non Linear.

Text Books:

1. Computer System Architecture By, M. Morris Mano Prentice- Hall, 1993.
2. Computer Architecture & Organization By John P. Hayes, McGraw Hill-1998
3. Computer Organization & Architecture By V. Rajaraman , T. Radhakrishnan , PHI

Reference Books:

1. Structured Computer Organization by Andrew S. Tanenbaum.
2. Computer architecture a quantitative approach, Patterson D. A. and Hennessy, J. L.,
3. Second Edition, Morgan Kaufman, 1996.
4. Computer Organization and Architecture, W. Stallings, LPE
5. Computer Organization and Design, P. Pal Chaudhary, PHI

Course Outcomes:

After successful completion of this course, students will be able to-

1. To master the binary and hexadecimal number systems and computer arithmetic,
2. To identify machines based on Von Neumann architecture and shall also be familiar with the functional units of the processor such as the register file and arithmetic-logical unit.
3. To identify systems based on single-cycle (MIPS), multi-cycle (MIPS), parallel, pipelined superscalar, and RISC/CISC architectures.
4. To analyze the cost-performance issues and design trade-offs in designing and constructing a computer processor including memory chips.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Telecom Switching & Computer Networks
Laboratory (NS2 / QUALNET/OPNET)**

Semester: **IV**
Code: **333461(33)**

Total Lab Periods: **36**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: *(At least Ten experiments are to be performed by each student)*

1. Introduction to Local Area Network with its cables, connectors, Switches, Hubs and topologies.
2. Installation of UTP, Co-axial cable, Cross cable, parallel cable NIC and LAN card.
3. To study the network topology and IP Addressing scheme of Institute Network.
4. Case Study of Ethernet (10 base 5, 10 base 2, 10 base T)
5. Installation and working of Net meeting and Remote Desktop.
6. Installation and working with Telnet (Terminal Network).
7. Installation and working with FTP (File Transfer Protocol). Write a program to simulate FTP Server.
8. Installation and Computers via serial or Parallel ports and enable the computers to share disk and printer port.
9. To connect two Personal Computer with Telephone line.
10. Installation of Modem and Proxy Server.
11. Installation of Windows 2003 server/ Windows 2000 server.
12. Introduction to Server administration and Configuration of DHCP.
13. Write a program to encrypt and decrypt a file using a key.
14. Write a program to simulate the stop and wait protocol.
15. Write a program to simulate the Go n Back ARQ protocol.
16. Write a program to simulate echo server.

LIST OF EQUIPMENTS/MACHINES REQUIRED

- Software Requirements: - Windows 2003 server/Windows 2000 server.
- Hardware Requirements: - LAN Trainer Kit LAN Card Cable, Connectors, HUB, Switch, Crimping Tools.

Recommended Book:

Computer Network and internet by Douglas E. Comer (Pearson Education)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Data Structures and Algorithm Analysis
Laboratory**

Semester: **IV**
Code: **333462(33)**

Total Lab Periods: **36**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

(Note: The programs can be implemented using C or C++ in windows or Linux environment)

1. Write a program to perform following operations in 1-d array: insertion, deletion, reverse, display, and search.
2. Write a program to perform matrices addition, multiplication and transpose.
3. Write a program to perform linear and binary search.
4. Write a program to add two polynomials using array.
5. Write a program to implement sparse matrices and transpose of matrices.
6. Write a program to perform bubble sort on a given array.
7. Write a program to perform selection sort on a given array.
8. Write a program to perform insertion sort on a given array.
9. Write a program to perform quick sort on a given array.
10. Write a program to perform merge sort on a given array.
11. Write a program to implement stack operations:push, pop.
12. Write a program to check palindrome using stack.
13. Write a program to evaluate postfix expression using stack.
14. Write a program to convert infix expression into postfix or prefix expression using stack.
15. Write a program to check nested expression validity using stack
16. Write a program to implement queue operations: insertion, deletion.
17. Write a program to implement insertion at the beginning and the end of linked list.
18. Write a program which represents stack using linked list.
19. Write a program which represents queue using link list.
20. Write a program to perform arithmetic addition of two very large integers using doubly linked list.
21. Write a program to perform all the three types of tree traversals upon the constructed binary search tree.
22. Write a program to perform binary tree sorting to display the data in ascending and descending order sequence.
23. Write a program to display the adjacency matrix and adjacency list equalent on a given graph structure
24. Write a program to perform depth first search on a given graph structure.
25. Write a program to perform breadth first search on a given graph structure.

List of Equipments/Software/Machines Required

- Linux Operating System and/ or Windows Operating System
- Turbo C/C++ IDE and compiler.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Analog Electronics Laboratory**

Semester: **IV**
Code: **333463(28)**

Total Lab Periods: **36**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Static output characteristic curve CE transistor.
2. Static input characteristic curve of CB transistor.
3. Static output characteristic curve of CB transistor.
4. To design and study the frequency response of single stage CE transistor amplifier.
5. To study the frequency response of RC coupled double stage CE transistor amplifier.
6. To study the frequency response of RC coupled double stage CE transistor amplifier with voltage feedback.
7. To study the frequency response of RC coupled double stage CE transistor amplifier with current feedback.
8. To plot the voltage gain vs. load characteristics of common collector (emitter follower) n-p-n transistor.
9. Experiment with emitter follower a voltage series feedback amplifier.
10. General study of push pull audio power amplifier.
11. To study RC phase shift oscillator.
12. Study of various topologies of feedback amplifier.
13. Experiment with Darlington pair amplifier.
14. To study Wein Bridge Oscillator.

List of Equipments/Machines Required

Bread board, Circuit components, Power supply, Cathode Ray Oscilloscope (CRO), Function generator, Multimeter

Recommended Books:

1. Integrated Electronics – Millman & Halkias, TMH.
2. Microelectronics – Millman and Grabel, TMH.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**
Branch: **Information Technology**
Subject: **Object Oriented Concepts & Programming**
using C++ Laboratory

Semester: **IV**
Code: **333464(33)**

Total Lab Periods: **36**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

List of Experiments: (At least Ten experiments are to be performed by each student)

1. Write a Program to check whether number is prime or not.
2. Write a Program to read number and to display the largest value between: (a) Two number, (b) Three Numbers, (c) Four numbers by using switch-case statements.
3. Write a Program to find sum of first natural numbers: $sum = 1+2+3+4+\dots+100$ by using (a) *for* loop, (b) *while* loop, (c) *do-while* loop
4. Write a Program to find sum of the following series using function declaration: $Sum = x - (x^3)/3! + (x^5)/5! - \dots + (-1)^n (x^n)/n!$
5. Write a Program to read the element of the given two matrixes & to perform the matrix multiplication.
6. Write a Program to exchange the contents of two variables by using (a) Call by value, (b) Call by reference.
7. Write a Program to perform the following arithmetic operations of a complex number using a structure: (a) Addition of two complex numbers, (b) Subtraction of two complex numbers, (c) Multiplication of two complex numbers, (d) Division of two complex numbers.
8. Write an object oriented program (OOP) using C++ to exchange the private data members of two different functions using friend functions.
9. Write an OOP using C++ to count how many times a particular member function of a class is called by: (a) A particular object, (b) Any objects
10. Write an OOP using C++ to define a constructor for a "Date" class that initializes the Date objects with initial values. In case initial values are not provided, it should initialize the objects with default values.
11. Write an OOP using C++ to overload == operator to compare two strings.
12. Write an OOP using C++ to perform simple arithmetic operations of two complex numbers using operator overloading.
13. Write a C++ program to demonstrate how ambiguity is avoided using scope resolution operator in the following inheritance: (a) Single inheritance, (b) Multiple inheritance
14. Write a C++ Program to perform the swapping of two data items of integer, floating point number and character type with the help of function overloading.
15. Write a C++ program to generate a Fibonacci series by overloading: (a) Prefix Operator, (b) Postfix Operator.
16. Write a C++ program to access the private data of a class by non-member function through friend function where the friend function is declared: (a) in the location of public category, (b) in the location of private category, (c) within the scope of a class definition itself, (d) defined with inline code subtraction.
17. Write a C++ program to demonstrate how a pure virtual function is defined, declared and invoked from the object of derived class through the pointer of the base class.
18. Write a C++ program to open a file and count the number of characters, number of vowels and number of newline characters present in the file.
19. Write a program to copy the contents of one text file to another and display both the files using a text Menu.
20. Create a database of 10 students. The database should contain the Name, Marks of 5 subjects, Aggregate Marks, Aggregate percentage and Division according to the following conditions: (a) Percentage above or equal to 60 – First division, (b) Percentage between 50 and less than 60 – Second division, (c) Percentage between 40 and less than 50 – Third division, (d) Percentage below 40 – Improvement required
Display the above database of every student in a tabulated form. Implement the above program using Structures, Text-Menu and File I/O operations.
21. Write an OOP using a class template to read any five parameterized data type such as float and integer, and print the average.
22. Write a C++ program to Bubble Sort using template function.
23. Write a C++ program to read two numbers and find the division of these two numbers using exception handling.
24. Write a C++ program to create a function which take a parameter, if the value of parameter is > 0 then throw integer type, if parameter is $= 0$, then throw character type, if parameter is < 0 then throws float type exception but for all design use only one catch block.
25. Write a C++ program for invoking, for that generate & handle exception.

List of Equipment/Machine Required

Pentium IV machine, Turbo C++ compiler / gcc, windows / Linux environment

Recommended Books :

1. Programming with C++ : D Ravichandran
2. OOP's with C++ : E. Balaguruswamy .
3. Programming with C++ : Venugopal .
4. Object Oriented Programming in C++ : Strout Strups.
5. OOP with C++ : Robert Lafore
6. Let us C++ : Yaswant Kanetkar.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Engineering**

Branch: **Information Technology**

Subject: **Health, Hygiene & Yoga**

No. Of Periods: **2 Periods/Week**

Maximum Marks: 40

Semester: **IV**

Code: **333465(46)**

Total Tutorial Periods: **NIL**

Minimum Marks: 24

Course Objectives:

- 1 To provide understanding the importance of health.
- 2 To provide insight into the hygiene aspect & quality of life.
- 3 To study the concepts of various medical therapy.
- 4 To practice the various yogasans.
- 5 To provide knowledge about common diseases and its cure through yagasans and pranayam.
- 6 To develop concentration through various methods.

UNIT-I HEALTH & HYGIENE: Concept of health, Physical health and mental health and wellbeing and how to achieve these, longevity and how to achieve it, concept and common rules of hygiene, cleanliness and its relation with hygiene; Overeating and underrating, amount of food intake required, intermittent fasting; adequate physical labour, sleep; consumption of junk fast food vs nutritious food; fruits, vegetables cereals and qualities of each of these.

UNIT-II INTRODUCTORY KNOWLEDGE OF COMMON STREAMS OF MEDICINAL CURE: History, development, basic concepts, modes of operation of Alopahy, Ayurved, Homoeopathy, Biochemic, Unani, Siddha, Accurpressure, Accupunture, Naturopathy, Yogic and Herbal system of medicines, Introduction of Anatomy and Physiology concerned.

UNIT-III YOGASANS: Meaning and concept of Yoga, Yogasans and its mode of operation, How to perform Yogasans, Common Yogasans with their benefits, such as, Padahastasan, Sarvangasan, Dhanurasan, Chakrasan, Bhujangasan, Paschimottasan, Gomukhasan, Mayurasan, Matsyasan, Matsyendrasan, Pawanmuktasan, Vajrasan, Shalabhasan, Sinhasan, Shashankasan, Surya Namaskar, Halasan, Janushirasan, Utshep Mudra.

UNIT-IV YOGASANS FOR COMMON DISEASES: From Yogic MateriaMedica with symptoms, causes, asans and herbal treatment.

- **Modern silent killers:** High blood pressure, diabetes and cancer, causes and cure; Common health problems due to stomache disorders, such as, indigestion, acidity, dycentry, piles and fissures, artheritis, its causes, prevention and cure.
- **Asans for relaxation:**Shavasan, Makarasan, Matsyakridasan, Shashankasan.
- **Asans to increase memory and blood supply to brain:**Shirshpadasan, Shashankasan.
- **Asans for eye sight:**Tratak, NetiKriya .
- **Pranayam:** Definition and types: NadiShodhan, Bhastrik, Shitakari, Bhramari useful for students.

UNIT-V CONCENTRATION: Concentration of mind and how to achieve it. **Tratak (त्राटक)**. Concentration on breath, **Japa (जप)**. **Ajapajap (अजपाजप)**, internal silence (**अन्तर्मान**), visualization in mental sky (**विदाकाश धारणा**). Concentration on point of light (**ज्योति ध्यान**). Concentration on feeling (**भाव ध्यान**). Concentration on figure (**मूर्त ध्यान**).

Text Books:

Health, Hygiene & Yoga, Dr P B Deshmukh, Gyan Book Pvt Ltd. New Delhi.

Reference Books:

- (1) Yogic MateriaMedica
- (2) Asan, Pranayam and Bandh.

Chhattisgarh Swami Vivekanand Technical University

Bhilai(C.G)

Scheme of Teaching and Examination B.E. V Semester Information Technology

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Computer Science & Engg.	322551(22)	Microprocessor & Interfaces	3	1	-	80	20	20	120	4
2	Information Technology	333552(33)	Principles of Communication system	4	1	-	80	20	20	120	5
3	Information Technology	333553(33)	Database Management System	3	1	-	80	20	20	120	4
4	Information Technology	333554(33)	Operating System	3	1	-	80	20	20	120	4
5	Information Technology	333555(33)	Programming in Java	3	1	-	80	20	20	120	4
6	Information Technology	333556(33)	Theory of Computation	3	1	-	80	20	20	120	4
7	Information Technology	333562(33)	Principles of Communication System Lab	-	-	3	40		20	60	2
8	Information Technology	322561(22)	Microprocessor and Interfaces Lab	-	-	3	40		20	60	2
9	Information Technology	333563(33)	Database Management System Lab	-	-	3	40		20	60	2
10	Computer Science & Engg	333564(33)	Programming in Java Lab	-	-	3	40		20	60	2
11	Humanities	300565(46)	Personality Development	-	-	2			20	20	1
12	Information Technology	333566(33)	* Practical Training Evaluation & Library	-	-	1			20	20	1
TOTAL				19	6	15	640	120	240	1000	35

L: Lecture **T: Tutorial** **P: Practical**
ESE: End Semester Examination **CT: Class Test** **TA: Teachers Assessment**

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

** Industrial Training of eight weeks is mandatory for B.E. student. It is to be completed in two parts. The first part will be in summer after IV semester after which students have to submit a training report which will be evaluated by the college teachers during B.E. V semester.*

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	V		
Subject:	Principles of Communication System	Code:	333552(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

COURSE OBJECTIVE:

- To understand Analog and Digital Modulation Techniques
- To learn Advanced Communication Techniques & its application in different industry

COURSE OUTCOME:

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

- Describe various modulation techniques in Analog and digital communication Techniques
- Describe working of light propagation in Optical fiber and explain Satellite Communication System
- Have an understanding of design considerations for multiple access / use spectrum and multiplexing.

- UNIT I Amplitude Modulation:** Need for Modulation, Amplitude Modulation, Amplitude Modulation Index, Modulation Index for Sinusoidal AM, Frequency spectrum for Sinusoidal AM, Average power for Sinusoidal AM, Effective voltage and current for sinusoidal AM, Balanced Modulator, The Square law demodulator, Non sinusoidal modulation, DSBSC Modulation, SSB modulation and generation, VSB, FDM.
- UNIT II Angle Modulation:** Phase and frequency modulation and their relationship. Frequency deviation, spectrum of FM Signal, BW of FM Signal, Effect of modulation on BW, constant BW, FM phasor diagram, Narrow band F.M. Armstrong and Parameter variation methods of FM generation and FM demodulators.
- UNIT III Sampling, Quantization and Coding :** Sampling theorem, Pulse Modulation: PAM, PPM, PWM. Quantization of Signals, Quantization error, TDM, Pulse Code Modulation (PCM), DPCM, DM, ADM AND their comparative performance evaluation.
- UNIT IV Digital Modulation:** Digital Modulation: Generation and detection of BASK, BPSK and BFSK; ASK, FSK, PSK performance evaluation, Fundamentals of QPSK and DPSK , generation and detection of QPSK and DPSK; Definition of MSK, M-Ary PSK and its application areas.
- UNIT V Advanced Communication Techniques:** Satellite Communication: Components and Block diagram of Satellite communication system, Transponders, Up-link and Down-link budget calculations. Fiber Optic Communication: Principles of light propagation in optical fiber, Losses in fibers, Dispersion, Connectors and splices, Fiber optic communication link.

Text Books:

1. Principles of Communication system by H.Taub and D.L. Shilling. TMH, 2008.
2. Communication Systems by R. P. Singh and S. D. Sapre 2nd Edition TMH.

Reference Books:

1. Electronic Communications by Roddy & Coolen, PHI, 4th Ed.
2. An Introduction to the Principle of Communication Theory by J.C. Hancock, Mc-Graw Hill.
3. Communication System-by A.B. Carlson ,Mc-Graw Hill, 3rd Ed.
4. Electronic Communication System by Kenedy & Davis, TMH, 5th Ed.

Name of the Programme: Bachelor of Engineering ::::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch: **Computer Science & Engineering**

Subject: **Microprocessor & Interfaces**

Total Theory Periods: **40**

No. of class Tests to be conducted: **2 (Minimum)**

ESE Duration: **Three Hours**

Semester: **V**

Code: **322551 (22)**

Total Tutorial Periods: **10**

No. of assignments to be submitted: **One per Unit**

Minimum Marks in ESE: **28**

Maximum Marks in ESE: **80**

COURSE OBJECTIVE: To introduce the basic concepts of microprocessor & assembly language programming.

COURSE OUTCOME:

1. The student will be able to analyse, specify, design, write and test assembly language programs of moderate complexity.
2. The student will be able to select an appropriate 'architecture' or program design to apply to a particular situation; e.g. an interrupt-driven I/O handler for a responsive real-time machine. Following on from this, the student will be able to design and build the necessary programs.

UNIT I: Introduction to Basic Microprocessors: Historical Background, the Harvard and Princeton architecture, The Microprocessor-Based Personal Computer Systems. The Microprocessor 8085, 8088 basics and comparison (Block & Pin diagram only).

UNIT II: Microprocessor Architecture 8086: 8086 basic block diagram, Internal Microprocessor Architecture, Real Mode Memory Addressing, Registers, pin configuration, segmentation.
Data Movement Instructions: MOV, PUSH/POP, Load-Effective Address, String Data Transfers, Miscellaneous Data Transfer Instructions, Segment Override Prefix, Assembler Details. Arithmetic and Logic Instructions: Addition, Subtraction and Comparison, Multiplication and Division, BCD and ASCII Arithmetic, Basic Logic Instructions, Shift and Rotate, String Comparisons. Program Control Instructions: The Jump Group, Controlling the Flow of the Program, Procedures, and Introduction to Interrupts, Machine Control and Miscellaneous Instructions. Assembler directives, assembler instructions, Assembly Language Programming.

UNIT III: Assembly Language programming with C/C++, Interrupt and Timing diagrams: Using Assembly Language with C/C++ for linking C/C++ into assembly language, Basic Programs - Use of BIOS and DOS Interrupts in assembly & C/C++, Interrupts of 8086 microprocessors, Timing diagram of 8086 microprocessor.

UNIT IV: Memory and I/O Interfacing: Minimum and Maximum mode configuration of 8086, Memory Interface with 8086 microprocessor, Address Decoding. Basic I/O Interface: Introduction to I/O Interface, I/O Port Address Decoding. I/O Interface using peripheral devices: The Programmable Peripheral Interface 8255, Programmable Interval Timer 8254. **Direct Memory Access:** Basic DMA Operation and Definition.

UNIT V: Advanced Microprocessors: 80386- Features, block diagram, data types, supported registers, memory system, real mode and protected mode operation, descriptors, cache register, control register, paging mechanism, virtual mode, and protection mechanism for operating system..
Comparative Study of Modern Microprocessor (Web based Reference for study): Pentium Pro (Pentium II, Pentium III, Pentium IV), Core i3,i5,i7 and Atom processors.

Text Book:

1. Barry B Brey: The Intel Microprocessors, 8th Edition, Pearson Education, 2009. (Listed topics only from the Chapters 1 to 13)
2. Ramesh S. Gaonkar : Microprocessor Architecture, programming and Application with 8085, 4th Edition, Wiley,2012

Reference Books:

1. Douglas V. Hall: Microprocessors and Interfacing, Revised 2nd Edition, TMH, 2006.
2. James L. Antonakos: The Intel Microprocessor Family: Hardware and Software Principles and Applications, Cengage Learning, 2007.

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

3. Niles B. Bahadure: Microprocessors: The 8086/8088, 80186/80286, 80386/80486 and the Pentium family, 2nd edition (2014), Prentice Hall of India (PHI).
4. K. Udaya Kumar & B.S. Uma Shankar: Advanced Microprocessors & IBM-PC Assembly Language Programming, TMH 2003.
5. Microprocessor: Theory and Applications- Intel and Motorola, Rafiquzzaman, PHI.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: Information Technology	Semester: V
Subject: Database Management System	Code: 333553 (33)
Total Theory Periods: 40	Total Tutorial Periods: 10
No. of class Tests to be conducted: 2 (Minimum)	No. of assignments to be submitted: One per Unit
ESE Duration: Three Hours	Maximum Marks in ESE: 80 Minimum Marks in ESE: 28

COURSE OBJECTIVE:

- To understand the role of a database management system and its users in an organization.
- To understand database concepts, including the structure and operation of the relational data model.
- To successfully apply logical database design principles, including E-R diagrams and database normalization.
- To construct simple and moderately advanced database queries using Structured Query Language (SQL).
- To understand the concept of transaction, its properties and how to persist the data in complex concurrent users environment.

COURSE OUTCOME:

- Will be able to describe the basic concepts of RDMBS and relational data model
- Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
- Understand DML, DDL and will be able to construct queries using SQL by knowing the importance of data & its requirements in any applications.
- Be familiar with the basic issues of transaction, its processing and concurrency control.
- Able to translate DB designs from relational notation to ER notation & con Perform normalization once redundancies have been eliminated.
- Be familiar with basic db storage structures, access techniques: file / page organizations, indexing methods including B-tree, hashing.

- UNIT I INTRODUCTION TO DATA BASE:** Advantages of DBMS, Type of Data Models, Scheme and instances, DBMS Architecture and Data Independence, Entity- Relationship Model, Attributes and Keys, Relationship Types, Weak Entity, Enhanced E-R Modeling, Specialization and Generalization, Record Storage and Primary File Organizations: Introduction, Secondary Storage Devices, Buffering of Blocks, Structure of Files: Types of Single Level ordered indexes, Multilevel indexes, Dynamics Multilevel indexes using B-trees and B+- Trees.
- UNIT II THE RELATIONAL DATA MODEL:** Relational data model concepts, constraints, relational algebra, relational calculus, SQL: DDL, DML, DCL, View, Index, Cursors and Triggers
- UNIT III DATABASE DESIGN:** Function Dependencies and Normalization for Relational Databases: Informal design guidelines for relation schemes, Functional dependencies, Normal forms based on primary keys, General definitions of second and third normal forms, Boyce-codd normal form, problem related with normal forms & solutions. Multivalued & Join Dependencies, 4th & 5th Nonmalization.
- UNIT IV QUERY & TRANSACTION PROCESSING:** Query Processing: Query processing stages, Query interpretation, Query execution plan, Table scans, Fill factor, Multiple index access, Methods for join tables scans, Structure of a query optimizer. Transaction Processing: Types of failures, ACID property, schedules and recoverability, serialisability of schedules, Levels of transaction consistency, Deadlocks, Nested transaction, Transaction benchmarking.
- UNIT V CRASH RECOVERY:** Failure classification, Different type of Recovery techniques & their comparative analysis, deferred update, immediate update, Shadow paging, Check points, On-line backup during database updates, Concurrency Control: Different type of concurrency control techniques & their comparative analysis, Locking techniques, Time-stamp ordering, Multi-version techniques, Optimistic techniques, Multiple granularity, Integrity, Security, Non-procedural procedural integrity constraints and Integrity constraints specifications in SQL.

Text Books:

1. Database system concept, Korth & Sudarshan, TMH, 5th Ed.
2. Introduction to Database Systems, C.J.Date, Pearson Education, 8th Ed.

Reference Books

1. Principles of Database Systems”, 2nd Edn., Ullman, J.O, Galgotia Publications.
2. Fundamentals of Database Systems, Elmasri R. & Navathe S.B., Pearson Education.

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	V		
Subject:	Operating System	Code:	333554 (33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

- General understanding of structure of modern computers
- To understand purpose, structure and functions of operating systems
- To illustration of key OS aspects by example

Course Outcomes:

By the end of the course you should be able to-

- Describe the general architecture of computers and operating system
- Understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files.

- UNIT I INTRODUCTION:** Operating System objective and function. The Evolution of Operating Systems, Batch, interactive, time – sharing and real time systems. Protection. Operating System Structure: System COMPONENTS, operating system service, System structure. Distributed Computing, The Key Architecture Trend: Parallel Computation, Input-Output Trends.
- UNIT II CONCURRENT PROCESSES:** Process concept: - Introduction Definitions of “Process”, Process States, Process State Transitions, The process Control Block, Operations on Processes, Suspend and Resume, Interrupt Processing, The Nucleus of the Operating System. Asynchronous Concurrent Process: - Introduction, Parallel Processing, A Control Structure for Indicating Parallelism, Mutual Exclusion, The Producer / consumer problem, the critical section problem, semaphores, Classical problems in concurrency, Inter process Communication, Process generation, Process Scheduling. CPU Scheduling: Scheduling concepts, Performance criteria, and scheduling algorithms. Algorithm evaluation, Multiprocessor scheduling.
- UNIT III DEAD LOCKS:** System model. Deadlock characterization. Prevention, avoidance and detection, Recovery from dead lock Combined approach.
- UNIT IV MEMORY MANAGEMENT:** Base machine, resident Monitor, Multiprogramming with fixed partitions. Multiprogramming with variable partitions. Multiple Base Registers. Paging, segmentation paged segmentation, Virtual Memory concept, Demand Paging, Performance, Page Replacement algorithms, Allocation of frames, Thrashing, Cache memory organization impact on performance.
- UNIT V I/O MANAGEMENT & DISK SCHEDULING:** I/O Devices and the organization of the I/O function. I/O Buffering, Disk I/O, Operating System Design issues. File System: File concept- File organization and Access mechanism, File Directories, File sharing. Implementation issues. Case Studies: - Unix System, MVS, OS/2, A Virtual Machine Operating System.

Text Books

1. Operating System Concepts, Silberschatz A. and Peterson, J. L., Wiley, 8th Ed.
2. An Introduction to Operating Systems, Dietel, H. N., Addison Wesley, 2nd Ed.

References Books

1. Operating System: Concept & Design, Milenkovic M., and McGraw Hill.

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

2. Operating System, Stalling, William, Maxwell McMillan International Editions, 1992.
3. Operating System Design & Implementation, Tanenbaum, A. S., Prentice Hall NJ

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: Information Technology	Semester: V
Subject: Programming in Java	Code: 333555 (33)
Total Theory Periods: 40	Total Tutorial Periods: 10
No. of class Tests to be conducted: 2 (Minimum)	No. of assignments to be submitted: One per Unit
ESE Duration: Three Hours	Maximum Marks in ESE: 80 Minimum Marks in ESE: 28

COURSE OBJECTIVE:

1. Make them learn about Java programming concepts, graphical user interfaces, basic data structures.

COURSE OUTCOME:

- Can develop solutions for a range of problems using object-oriented programming.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.

UNIT I	INTRODUCTION: History of Java, Features of Java, data types, variables, literals, expressions, operators, programming constructs, Enhanced for loop, Comparison with C++, Java program Compilation and Execution, JVM as an interpreter and emulator, class File Format, Class loaders, Verification, Class Area, Java Stack, Heap, Security Promises of the JVM, Garbage Collection.
UNIT II	CLASSES AND OBJECTS: Classes, Objects and References, "this" keyword, Methods, Accessors and Mutators, overloading method, static keyword, Access specifiers, Arrays, Command line arguments. Constructors and finalizers, overloading constructors, Inner classes, Wrapper Classes, Cloning objects, Shallow and Deep Cloning, Type compatibility and conversion. Inheritance; definition and advantages, overriding, Super, final and abstract classes, Interface, Package: Defining package, interfaces in package, importing packages.
UNIT III	EXCEPTION HANDLING, STRINGS AND COLLECTION API: Basics of exception handling, Checked and Unchecked Exceptions, default Exception handling, try and catch, Multiple catch statements, try-catch-finally, uses of throw and throws, Strings: string constructor, string arithmetic, string methods, StringBuffer and methods. Overview of Collections Framework.
UNIT IV	MULTI THREADING AND FILE HANDLING: Thread Concepts, Thread life cycle, Runnable Vs Thread Class, Thread Priority, Thread Methods, Thread Synchronization: Concept of Monitor, Synchronized methods & Synchronized blocks, Deadlocks. File Handling using Java, Streams, Byte and Character Streams, Various operations with files.
UNIT V	GUI APPLICATION AND APPLLET DEVELOPMENT: Overview of AWT , applets and application, applet life cycle, User interfacing components, Layout Managers, Event Driven programming in java, Event delegation model, Event types and classes, Listeners, Overview of Swing Components. Introduction to JDBC, ODBC, JDBC drivers: Type I, Type II, Type III, Type IV. JDBC Architecture, executing DDL, DML, DCL commands.

TEXT BOOKS:

1. Introduction to Java Programming: Liang, Pearson Education, 7th Edition.
2. Java The complete reference: Herbert Schildt, TMH, 5th Edition.

REFERENCE BOOKS:

1. Balguruswamy, Programming with JAVA, TMH.
2. "Head first Java" by Kathy Sierra, Bert Bates , O'Reilly Media Publication.
3. Big Java: Horstman, Willey India, 2nd Edition.
4. Java Programming Advanced Topics: Wigglesworth, Cengage Learning.
5. Java How to Program: H.M. Deitel & Paul J. Deitel, PHI, 8th Edition.

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	V
Subject:	Theory of Computation	Code:	333556 (33)
Total Theory Periods:	40	Total Tutorial Periods:	10
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit
ESE Duration:	Three Hours	Maximum Marks in ESE:	80
		Minimum Marks in ESE:	28

COURSE OBJECTIVE:

- Students will learn about a variety of issues in the mathematical development of computer science theory, particularly finite representations for languages and machines,
- Students will gain a more formal understanding of algorithms and procedures.

COURSE OUTCOME:

At the end of this course students will:

- Be able to construct finite state machines and the equivalent regular expressions.
- Be able to prove the equivalence of languages described by finite state machines and regular expressions.
- Be able to construct pushdown automata and the equivalent context free grammars.
- Be able to prove the equivalence of languages described by pushdown automata and context free grammars.
- Be able to construct Turing machines and Post machines.

- UNIT I THE THEORY OF AUTOMATA :** Introduction to automata theory, Examples of automata machine, Finite automata as a language acceptor and translator. Deterministic finite automata. Non deterministic finite automata, finite automata with output (Mealy Machine. Moore machine). Finite automata with ϵ moves, Conversion of NFA to DFA by Arden's method, Minimizing number of states of a DFA. Myhill Nerode theorem, Properties and limitation of FSM. Two way finite automata. Application of finite automata.
- UNIT II REGULAR EXPRESSIONS :** Regular expression, Properties of Regular Expression. Finite automata and Regular expressions. Regular Expression to DFA conversion & vice versa. Pumping lemma for regular sets. Application of pumping lemma, Regular sets and Regular grammar. Closure properties of regular sets. Decision algorithm for regular sets and regular grammar.
- UNIT III GRAMMARS:** Definition and types of grammar. Chomsky hierarchy of grammar. Relation between types of grammars. Role and application areas of grammars. Context free grammar. Left most linear & right most derivation trees. Ambiguity in grammar. Simplification of context free grammar. Chomsky normal form. Greibach normal form, properties of context free language. Pumping lemma from context free language. Decision algorithm for context tree language.
- UNIT IV PUSH DOWN AUTOMATA AND TURING MACHINE:** Basic definitions. Deterministic push down automata and non deterministic push down automata. Acceptance of push down automata. Push down automata and context free language. Turing machine model. Representation of Turing Machine Construction of Turing Machine for simple problem's. Universal Turing machine and other modifications. Church's Hypothesis. Post correspondence problem. Halting problem of Turing Machine
- UNIT V COMPUTABILITY:** Introduction and Basic concepts. Recursive function. Partial recursive function. Partial recursive function. Initial functions, computability, A Turing model for computation. Turing computable functions, Construction of Turing machine for computation. Space and time complexity. Recursive enumerable language and sets.

Text Books :

1. Theory of Computer Science (Automata Language & Computation), K.L.P. Mishra and N. Chandrasekran, PHI.
2. Introduction to Automata theory. Language and Computation, John E. Hopcroft & Jeffery D. Ullman, Narosa Publishing House.

Reference Books :

1. Finite Automata and Formal Languages: A Simple Approach, A.M. Padma Reddy, Pearson Education, India.
2. Theory of Automata and Formal Language, R.B. Patel & P. Nath, Umesh Publication.
3. An Introduction and finite automata theory, Adesh K. Pandey, TMH.
4. Theory of Computation, AM Natrajan. Tamarasi, Bilasubramani, New Age International Publishers.

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch: **Information Technology**
Subject: **Principles of Communication System
Laboratory**

Semester: **V**
Code: **333562(33)**

Total Lab Periods: **36**
Maximum Marks: **40**

Batch Size: **30**
Minimum Marks: **20**

Suggested List of Experiments (but should not be limited to):

1. To Draw the O/P waveform of Amplitude Modulation & Demodulation & Calculate Modulation Index.
2. To Draw the O/P waveform of Frequency Modulation & Demodulation & Calculate Modulation Index.
3. To Study DSB Transmitter & Receiver.
4. To Study SSB Transmitter & Receiver.
5. To Study FM Transmitter & Receiver.
6. To Observe & plot the Graph of PAM Modulation & Demodulation.
7. To Observe & plot the Graph of PPM Modulation & Demodulation.
8. To Observe & plot the Graph of PWM Modulation & Demodulation.
9. To Perform Sampling & Reconstruction of original signal & to calculate the Sampling Frequency.
10. To Perform Amplitude Shift Keying(ASK) thereby determining relative change in Amplitude.
11. To Perform Frequency Shift Keying(FSK) thereby determining relative change in Frequency.
12. To Perform Phase Shift Keying(PSK) thereby determining relative change in Phase
13. To Perform Quadrature Phase Shift Keying(QPSK) thereby determining relative change in Phase.
14. To Perform Quadrature Amplitude Modulation(QAM).
15. To perform Adaptive Delta Modulation , Demodulation .
16. To perform Delta Modulation & Compare it with Adaptive Delta Modulation (ADM).
17. To study & perform Transmission & Reception of signal using TDM Technique.

Text Book:

1. Electronic Communications by R.P.Singh & S.D.Sapre, TMH.
2. Electronic Communication System by Kenedy & Davis, TMH, 5th Ed.

Reference Books:

1. Principles of Communication system by H.Taub and D.L. Shiling, TMH, 2008.
2. An Introduction to the Principle of Communication Theory by J.C. Hancock, Mc-Graw Hill.
3. Signal Processing, Modulation and Noise -by Betts, English University Press, London.
4. Communication System-by A.B. Carlson, Mc-Graw Hill, 3rd Ed.

Name of the Programme: Bachelor of Engineering ::::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Computer Science & Engineering**
Subject: **Microprocessor & Interfaces Laboratory**
Total Lab Periods: **36**
Maximum Marks: **40**

Semester: **V**
Code: **322561(22)**
Batch Size: **30**
Minimum Marks: **20**

List of Experiment to be performed

1. To perform addition & subtraction of two 8 – bit hexadecimal numbers.
2. To perform addition & subtraction 16 – bit hexadecimal numbers.
3. To perform addition & subtraction 32 – bit hexadecimal numbers.
4. To perform addition & subtraction of two 8 – bit decimal numbers and store the result in DX register.
5. To perform addition & subtraction of two decimal digits 9 and 7 using ASCII code store the result in ASCII format.
6. To perform addition & subtraction of two decimal digits 97 and 25 using ASCII code store the result in ASCII format in CX-BX register.
7. To perform multiplication of 4 and 5 .
8. To perform division of 16 – bit number with 8-bit number.
9. To perform multiplication of two 8-bit numbers using ASCII code store the result in ASCII form in DX.
10. To perform division of two 8-bit numbers using ASCII code store the result in ASCII form in DX register.
11. To solve Arithmetic equation $3AX+5DX+BP$ and store the result in CX register.
12. To solve Arithmetic equation $(P*Q)+(R*S)$.
13. To add only positive number from 100 data bytes.
14. To write a program to add series of 20 bytes.
15. To find positive & negative byte from 100 data bytes.
16. To find largest & smallest byte from block of data.

- List of Equipment's/Machine Required: 8086 based microprocessor kit, MASM assembler, 8086 simulator, PCs.

Reference Books:

1. IBM PC Assembly Language and Programming, P. Abel, 5th Edition, PHI/Pearson Education.
2. Introduction To Assembly Language Programming, SivaramaP.Dandamudi, Springer Int. Edition,2003.
3. The 8088 and 8086 Microprocessors: Programming , Interfacing,Software,Hardware and Application,4th edition,W.A.Triebel,A.Singh,N.K.Srinath,Pearson Education

Name of the Programme: Bachelor of Engineering ::::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Database Management System Laboratory**
Total Lab Periods: **36**
Maximum Marks: **40**

Semester: **V**
Code: **333563(33)**
Batch Size: **30**
Minimum Marks: **20**

List of experiments:

1. To implement Data Definition language

- 1.1. Create, alter, drop, truncate
- 1.2. To implement Constraints.
 - 1.2.1. (a). Primary key, (b).Foreign Key, (c). Check, (d). Unique, (e). Null, (f). Not null , (g) . Default, (h). Enable Constraints, (i). Disable Constraints (j). Drop Constraints

2. To implementation of DML, DCL commands in RDBMS

- 2.1. (a).Insert, (b).Select, (c).Update, (d).Delete, (e).commit, (f).rollback, (g).save point, (i). Like'%' , (j).Relational Operator.

3. To implement Nested Queries & Join Queries

- 3.1.(a). To implementation of Nested Queries
- 3.2.(b). (a) Inner join, (b).Left join, (c).Right join (d).Full join

4. To implement Views

- 4.1. (a). View, (b).joint view, (c).force view, (d). View with check option

5. (a) Control Structure

- 5.1. To write a PL/SQL block for Addition of Two Numbers
- 5.2. To write a PL/SQL block for IF Condition
- 5.3. To write a PL/SQL block for IF and else condition
- 5.4. To write a PL/SQL block for greatest of three numbers using IF AND ELSEIF
- 5.5. To write a PL/SQL block for summation of odd numbers using for LOOP

5. (b) Procedures

- 5.6. To write a PL/SQL Procedure using Positional Parameters
- 5.7. To write a PL/SQL Procedure using notational parameters
- 5.8. To write a PL/SQL Procedure for GCD Numbers
- 5.9. To write a PL/SQL Procedure for cursor implementation
- 5.10. To write a PL/SQL Procedure for explicit cursors implementation
- 5.11. To write a PL/SQL Procedure for implicit cursors implementation

5. (c) Functions:

- 5.12. To write a PL/SQL block to implementation of factorial using function
- 5.13. To write a PL/SQL function to search an address from the given database

6. Triggers:

- 6.1. To write a Trigger to pop-up the DML operations
- 6.2. To write a Trigger to check the age valid or not Using Message Alert.
- 6.3. Create a Trigger for Raise appropriate error code and error message.
- 6.4. Create a Trigger for a table it will update another table while inserting values

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Programming in Java Laboratory**
Total Lab Periods: **36**
Maximum Marks: **40**

Semester: **V**
Code: **333564(33)**
Batch Size: **30**
Minimum Marks: **20**

List of Experiments (but should not be limited to):

1. Write a program to perform multiplication of two matrices.
2. Write a program to find the volume of a box having its side w,h,d means width ,height and depth. Its volume is $v=w*h*d$ and also find the surface area given by the formula $s=2(w*h+h*d+d*w)$. use appropriate constructors for the above.
3. Develop a program to illustrate a copy constructor so that a string may be duplicated into another variable either by assignment or copying.
4. Create a base class called shape. Apart from Constructors, It contains two methods get xyvalue() and show xyvalue() for accepting co-ordinates and to display the same. Create the sub class Called Rectangle which contains a method to display the length and breadth of the rectangle called showxyvalue().Illustrate the concepts of Overriding and Constructor call sequence.
5. Write a program that creates an abstract class called dimension, create two subclasses, rectangle and triangle. Include appropriate methods for both the subclass that calculate and display the area of the rectangle and triangle.
6. Write a program, which throws Arithmetic Exception. Write another class (in a different file) that handles the Exception.
7. Create a user defined Exception class which throws Exception when the user inputs the marks greater than 100 Catch it and again rethrow it.
8. Write a program to sort a stream of Strings.
9. Write a program to illustrate various String class methods.
10. Write a program to illustrate various String Buffer methods.
11. Write a program in which a Mythread class is created by extending the Thread class. In another class, create objects of the Mythread class and run them. In the run method print "CSVTU" 10 times. Identify each thread by setting the name.
12. Write a program to illustrate various Thread methods.
13. Write a Program to implement Bank Account Class which illustrates the concept of Thread Synchronization.
14. To write a program to create a text file using Byte Stream class.
15. To write a program to copy contents of one file to another.
16. Write a program to find numbers of occurrence of vowels in a file.
17. Write a program, which illustrates capturing of Mouse Events. Use Applet for this.
18. Write a program using swing components which simulates simple calculator.
19. Write a JDBC program for Student Mark List Processing.
20. Design a text editor, which is having some of the features of notepad.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of Program:	Bachelor of Engineering	Semester:	V
Branch:	Common to All Branches	Code:	300565 (46)
Subject:	Personality Development	Tutorial Period:	NIL
No. of Lectures:	2/Week	Marks in TA:	20
Total Marks in ESE:	NIL	Minimum number of Class Tests to be conducted:	Two

Objective: The course is introduced to develop one's outer and inner personality tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Personality Development is essential for overall development of an individual apart from gaining technical knowledge in the subject.

Course Objectives

Upon completion of this course, the student shall be able

- To understand the concept of personality and image;
- To develop leadership, listening and interacting skills;
- To develop attitudinal changes;
- To develop decision-making qualities; and
- To communication skill.

UNIT I Personality concepts: What is Personality – its physical and psychic aspects. How to develop a positive self-image. How to aim at Excellence. How to apply the cosmic laws that govern life and personality. How to improve Memory – How to develop successful learning skills. How to develop and effectively use one's creative power. How to apply the individual MOTIVATORS that make you a self-power personality.

UNIT II Interpersonal Skills: Leadership: Leaders who make a difference, Leadership: your idea, What do we know about leadership? If you are serious about Excellence. Concepts of leadership, Two important keys to effective leadership, Principles of leadership, Factors of leadership, Attributes. Listening: Listening skills, How to listen, Saying a lot- just by listening, The words and the music, How to talk to a disturbed person, Listening and sometimes challenging. How to win friends and influence people, How to get along with others. How to develop art of convincing others. How can one make the difference. How to deal with others particularly elders. Conflicts and cooperation.

UNIT III Attitudinal Changes: Meaning of attitude, benefits of positive attitudes, How to develop the habit of positive thinking.

Negative attitude and wining: What is FEAR and how to win it. How to win loneliness. How to win over FAILURE. How to win over PAIN. How to win over one's ANGER and others anger. What is stress and how to cope up with it? The art of self-motivation. How to acquire mental well-being. How to acquire physical well-being.

UNIT IV Decision Making: How to make your own LUCK. How to plan goals/objectives and action plan to achieve them. How to make RIGHT DECISION and overcome problems. How to make a Decision. Decision making: A question of style. Which style, when? People decisions: The key decisions. What do we know about group decision making? General aids towards improving group decision making.

UNIT V Communication Skills: Public Speaking: Importance of Public speaking for professionals. The art of Speaking - Forget the fear of presentation, Symptoms of stage fear, Main reason for speech failure, Stop failures by acquiring Information; Preparation & designing of speech, Skills to impress in public speaking & Conversation, Use of presentation aids & media.

Study & Examination: How to tackle examination, How to develop successful study skills.

Group discussions: Purpose of GD, What factors contribute to group worthiness, Roles to be played in GD.

Course Outcomes:

- The students will be able to develop inner and outer personality exposure;
- The students will be able to develop effective leadership qualities and interacting skills;
- The students will be able to develop positive attitude, motivating skills and develop winning philosophies;
- The students will be able to develop decision-making tools; and
- The students will be able to develop group presentation, public speaking and impressive conversation.

Text Books:

1. Basic Managerial Skills for all by E. H. McGrawth, prentice Hall India Pvt. Ltd., 2006
2. Basic Employability Skills by P. B. Deshmukh, BSP Books Pvt. Ltd., Hyderabad, 2014

Reference Books:

1. How to Develop a Pleasing Personality by Atul John Rego, Better Yourself Books, Mumbai, 2000
2. How to Succeed by Brain Adams, Better Yourself Books, Mumbai, 1969
3. Personality: Classic Theories & Modern Research; Friedman ; Pearson Education, 2006
4. How to Win Friends and Influence People by Dale Carnegie, A. H. Wheeler 2006

Name of the Programme: Bachelor of Engineering :::: Duration of the programme: Four Years

Chhattisgarh Swami Vivekananda Technical University, Bhilai(C.G)

Scheme of Teaching and Examination

B.E. VI Semester Information Technology

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Information Technology	333651(33)	Web Application Development	4	1	-	80	20	20	120	5
2	Information Technology	333652(33)	Information Theory & Coding	3	1	-	80	20	20	120	4
3	Information Technology	333653(33)	Software Engineering & Project Management	3	1	-	80	20	20	120	4
4	Information Technology	333654(33)	UNIX & Shell Programming	3	1	-	80	20	20	120	4
5	Information Technology	333655(33)	Computer Graphics & Animation	3	1	-	80	20	20	120	4
6	<i>Refer Table – I</i>		Professional Electives-1	3	1	-	80	20	20	120	4
7	Information Technology	333661(33)	Web Application Development Lab (PHP, MySQL, Ajax)	-	-	3	40	-	20	60	2
8	Information Technology	333662(33)	Software Engineering & Project Management Lab	-	-	3	40	-	20	60	2
9	Information Technology	333663(33)	UNIX & Shell Programming Lab	-	-	3	40	-	20	60	2
10	Information Technology	333664(33)	Computer Graphics & Animation Lab	-	-	3	40	-	20	60	2
11	Management	300665(76)	Managerial Skills	-	-	2	-	-	40	40	1
12	Information Technology	-----	Library	-	-	1	-	-	-	-	-
TOTAL				19	6	15	640	120	240	1000	34

L: Lecture **T:** Tutorial **P:** Practical

ESE: End Semester Examination **CT:** Class Test **TA:** Teachers' Assessment

Note: Industrial Training of eight weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV semester. The second part to be completed during summer after VI semester after which students have to submit a training report which will be evaluated by college teachers during B.E. VII semester.

Table -1: Professional Elective - I

S. N.	Board of Studies	Subject Code	Subject Name
1	Computer Science & Engg	333671(22)	Digital Signal Processing
2	Information Technology	333672(33)	Image Processing
3	Information Technology	333673(33)	Multimedia & Virtual Reality
4	Computer Science & Engg	333674(22)	Inter-Networking with TCP/IP
5	Information Technology	333675(33)	Advanced computer Network
6	Information Technology	333676(33)	Embedded and Real Time Operating Systems
7	Computer Science & Engg	333677(22)	Object Oriented Modeling & Design

Note:

- 1/4th of total strength of students subject to Minimum Strength of twenty students is required to offer an elective in the college in a particular academic session.
- Choice of elective course once made for an examination cannot be changed for future examinations.

Name of the Programme: Bachelor of Engineering ::::: Duration of the Programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI
Subject:	Web Application Development	Code:	333651(33)
Total Theory Periods:	40	Total Tutorial Periods:	10
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit
ESE Duration:	Three Hours	Maximum Marks in ESE:	80
		Minimum Marks in ESE:	28

Course objectives:

- To understand the working of Web Applications and client side technologies.
- To provide understanding of how XML can be developed and used.
- To understand e-commerce.
- To learn how to host and deploy the web applications on servers.

Course outcomes: After completion of this course students are able to

- Explain the understanding of working of web Applications.
- Explain Architectural Framework for e-commerce.
- Develop Web applications that can be hosted on web servers.

UNIT I	CLIENT SIDE TECHNOLOGIES: Java Script: Java Script – Java Script Object Model, Variables, Constants, Expressions, Conditions, Relational Operators, Functions: Creation and calling function, function returning values, Objects, Events and Event handlers, Accessing HTML form elements, accessing external java script file. AJAX: What is Ajax, How Ajax works, Synchronous and Asynchronous modes, creating <i>XMLHttpRequest</i> Object, Sending a Post and Get Request To a Server using open and send methods, Handling server response using <i>responseText</i> and response XML, The <i>onreadystatechange</i> Event, passing data to server side scripts: passing data to server with get and post.
UNIT II	SERVER SIDE TECHNOLOGIES: Introduction to Servlets, Benefits of using Java Servlets, Reading HTTP request headers, Sending data to a client and writing the HTTP response headers. Introduction to JSP, JSP Life Cycle, Basic Scripting elements: scriptlets, declaration, expressions, JSP Architecture, Directives, Implicit objects, request and response, working with cookies, Session management and tracking.
UNIT III	XML: What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data ,Defining Attributes & Entities in the DTD, Defining Parameter Entities & conditional Sections, Resolving a naming conflict, Using Namespaces.
UNIT IV	E-COMMERCE AND PAYMENT SYSTEM: Introduction to e-Commerce, e-Commerce Framework, e-Commerce and Media Convergence, Anatomy of e-Commerce Applications, e-Commerce Consumer Applications, e-Commerce Organization Applications. Architectural Framework for e-Commerce, WWW as the Architecture, Consumer Oriented Applications, Mercantile Process Models. Types of E-Payment Systems, Smart Cards, Credit Card -Based e-payment Systems.
UNIT V	WEBSITE PLANNING & HOSTING: Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Search Engines and Indexes, Overview of Search Engine Optimization, Introduction To File Transfer Protocol, Types Of FTP Servers (Including Anonymous), FTP Clients Common Command. Telnet Protocol, Telnet Client, Terminal Emulation. Usenet and Internet Relay Chat.

Text Books: -

1. Ajax Bible, Steve Holzner, Wiley, 2007.
2. JavaScript: The Definitive Guide, David Flanagan, O'Reilly Media, 6th Ed.

Reference Books:

1. JavaScript: The Good Parts, Douglas Crockford, 2008.
2. Xml: The Complete Reference, Williamson, 2001.
3. Head First Servlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates O'Reilly Media Publishers
4. Frontiers of Electronics of Commerce, Ravi kalakota & Andrew B. Whinston Addison Wesley
5. Advance Java– Gajendra Gupta, firewall Media, Laxmi Publication, 2006.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	Information Theory & Coding	Code:	333652(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

The main Objective to include this subject in Information Technology discipline is:

- To design and study of the mathematical model of communication systems and their corresponding probabilistic predictions.
- To motivate our students to optimize the bandwidth of communication channel, develop a secure and compact communication model.
- To minimize and control the erroneous condition in communication.
- Able to calculate capacity of Communication Channels.

Course Outcomes:

- Students will be able to acknowledge about the different probability of erroneous condition in communication and how to control it.
- They will learn to optimize the channel bandwidth and different conditions to improve efficiency of the communication system.
- Understand basic concepts of complexity of cryptographic security methods and their practical applications.
- Apply and control specific coding methods and be able to calculate the rate and error probabilities achieved.

UNIT I	INFORMATION THEORY: Uncertainty, Information, Information rate, mutual information; Marginal, conditional and joint Entropies;; Shannon's concept of information; Shannon's measure of information; Model for Communication system; Source coding and line/channel coding; channel mutual information capacity (Bandwidth)
UNIT II	SOURCE CODING: Model for source coding theorem; entropy of binary memory less source and its extension to discrete memory less source, Source with memory and its entropy, Encoding of the source output, source coding theorem, Huffman coding, Shannon-Fano coding, Discrete memory less Channels, Mutual information, Channel Capacity.
UNIT III	CHANNEL CODING: Binary Symmetric Channel, mutual information & its properties, Channel capacity, channel coding theorem and its application to BSC, Shannon's theorem on channel capacity, capacity of a channel of infinite bandwidth, bandwidth - S/N trade off, practical communication systems in light of Shannon's theorem, Fading channel, channels with memory.
UNIT IV	ERROR CONTROL CODING: BLOCK CODES: Types of codes; Error detecting codes, Parity check codes- Single parity codes; Parity check polynomials; error correcting codes, Block codes; Linear block codes, Cyclic codes -Syndrome calculation, Encoder and decoder - CRC ,Hamming codes, Hamming weight, Hamming distance, Minimum distance decoding, Hamming codes, Repetition codes.
UNIT V	ERROR CONTROL CODING: CONVOLUTIONAL CODES: Convolutional codes- Feedforward Convolutional Encoder, Trellis Representation, Viterbi Decoder for convolutional codes, Viterbi Decoder (contd.), Recursive convolutional encoders, Recursive convolutional encoders, Puncturing, Turbo encoders, Turbo Encoders (contd), Turbo Decoders, Free distance of convolutional codes.

Text Books:

1. Communication Systems by R. P. Singh and S. D. Sapre, 2nd Edition TMH.
2. Information Theory, Coding and Cryptography by Ranjan Bose, TMH, 2002.

Reference Books:

1. Elements of Information Theory by Thomas M. Cover, Joy A. John Wiley & Sons, 2nd edition, 2006.
2. John G. Proakis, "Digital Communications", 2nd Edition, McGraw Hill, 1989.
3. Digital Communication by Proakis, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	Software Engineering & Project Management	Code:	333653(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

- To study Software Engineering methodology and models and their impact on project management.
- To study case studies on System development and life-cycle management
- To study Project Management Theory (including formulation of goals, quality planning, estimation, risk assessment and management activities)
- To realize methods and techniques for project planning (including milestones and responsibility map)

Course Outcomes: Upon completion of this course students will be able to-

- Account for traditional and modern software development models and their relevance and suitability of different types of development projects, including agile software development.
- Analyze and discuss the different stages and processes in a development course, and discuss challenges related to the different stages.
- Have experience with the project as a work form in theory and practice
- Explain techniques for project management, estimating and risk assessment.

UNIT I	SOFTWARE PROCESS: Introduction – S/W Engineering Paradigm –Size Factors- life models (water fall, incremental, spiral, WINWIN spiral, RAD, prototyping, object oriented) – system - computer based system life cycle process – development process – system engineering hierarchy, Software Development Managerial Issues.
UNIT II	SOFTWARE REQUIREMENTS: Functional and non-functional–user–system–requirement engineering process- feasibility studies – requirements – elicitation– validation and management –Major factors that influence software cost, – S/W document. Analysis and modeling – data, functional and behavioral models structured analysis and data dictionary, SCM – Need for SCM – Version control – introduction to SCM process – Software configuration items.
UNIT III	DESIGN CONCEPTS AND PRINCIPLES: Design process and concepts – modular design – design heuristic – design model and document. Architectural design software architecture data design architectural design transform – user interface design – user interface design principles acquisitions system – monitoring and control system. Design byproducts: - Test Plans, Test Case Design, Milestones, Walkthroughs and Inspections.
UNIT IV	TESTING & MAINTENANCE: Taxonomy of software testing – Verification and Validation – test activities – types of s/w test – black box testing – testing boundary condition – structural testing –test coverage criteria Based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies –strategic approach and issue – unit testing – integration testing – validation testing – system testing and debugging.
UNIT V	SOFTWARE PROJECT MANAGEMENT: Measures and measurements – S/W complexity and science measure – size measure –data and logic structure measure information flow measure. Software cost estimation Software Cost Estimation Techniques, Expert Judgment, Delphi cost estimation (Recursive Estimation), The COCOMO Model, Work Breakdown Structures - Defining a Task Network – Scheduling Earned Value Analysis, Error Tracking – Software changes –program evolution dynamics software maintenance –Architectural evolution Taxonomy of CASE tools.

TEXT BOOKS:

1. Software engineering – A practitioner’s Approach, Roger S. Pressman, McGraw-Hill International Edition, 5th edition, 2001
2. Object Oriented Modelling & Design, Remgaugh J. Blaha, M. Premeralant, W. Eddy F. and Lornsen W. (PHI)

REFERENCE BOOKS:

1. Software engineering, Ian Sommerville, Person education Aisa. 6th edition 2000.
2. An Integrated Approach to Software Engineering , Pankaj Jalote, Springer Verlag.
3. Software Engineering – An Engineering Approach, James F. Peters and Witold Pedrycz., John Wiley and Sons. New Delhi. 2000.

Name of the Programme: Bachelor of Engineering ::::: Duration of the Programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	UNIX & Shell programming	Code:	333654(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

COURSE OBJECTIVE:

- To familiarize students with the Linux environment.
- To learn the fundamentals of shell scripting/programming .
- To familiarize students with basic Linux shell script programming.

COURSE OUTCOME: Students will be able to Work confidently in Unix/Linux environment.

- UNIT I INTRODUCTION TO UNIX:** Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip **UNIX UTILITIES:** Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities , detailed commands to be covered are tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio
- UNIT II INTRODUCTION TO SHELLS:** Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, -Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. **FILTERS:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.
- UNIT III GREP:** Operation, grep Family, Searching for File Content. **SED:** Scripts, Operation, Addresses, commands, Applications, grep and sed. **AWK:** Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.
- UNIT IV INTERACTIVE KORN SHELL:** Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process. **KORN SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.
- UNIT V INTERACTIVE C SHELL:** C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts. **C SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples. **FILE MANAGEMENT:** File Structures, System Calls for File Management system, INODES, Structure of Regular File, Directories, Conversions of a Path, name to an INODE, Super Block, INODE Assignment to a New File create, open, close, read, write, lseek, link, symlink unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

Text Books:

1. Unix and shell Programming, Behrouz A. Forouzan, Richard F. Gilberg Thomson.
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.

References:

1. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.
2. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
3. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.
4. Unix Shell programming, Yashwanth Kanitkar, 1st Edition, BPB Publisher

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	Information Technology	Semester:	VI		
Subject:	Computer Graphics & Animation	Code:	333655(33)		
Total Theory Periods:	40	Total Tutorial Periods:	10		
No. of class Tests to be conducted:	2 (Minimum)	No. of assignments to be submitted:	One per Unit		
ESE Duration:	Three Hours	Maximum Marks in ESE:	80	Minimum Marks in ESE:	28

Course Objectives:

- To provide an understanding of modeling algorithms for basic computer graphic components and acquiring practical knowledge of the same.
- To provide an overview of the key concepts of animation and visual effects with reference to workflow, viewers and technology;
- To provide hands-on experience in the programming 2-D computer animation.

Course Outcomes:

- An ability to apply knowledge of mathematics, science, and engineering to both software and hardware design problems.
- Demonstrating the ability to program animation and interactive projects at a professional level from ground level to finishing stages.
- Students should demonstrate proficiency and competency in advanced 3D modeling and animation software (specifically modeling, rigging, lighting, texturing and animation.).
- Students should be competent in the use of software packages with the ability to translate their artistic skills into any new software they encounter.
- Empowering graduates to make the best moving images work in consonance with good combination of sound, color, perspective, and storytelling into an established graphical context.

- UNIT I Overview Of Graphics System:** I/O devices, Raster scan & Random scan system, line circle generating algorithm: DDA , Bresenham line drawing algorithm, Circle generating algorithm: Midpoint, Bresenham, Mid-point ellipse generating algorithm,, 2-D & 3-D transformation: Translation, Rotation, Scaling, Shearing, Reflection; Solid area filling Algorithm: Boundary, Flood fill algorithm.
- UNIT II Viewing and Clipping:** Windows and Viewport, Viewing transformation; Clipping of 2-D & 3-D Lines: Cyrus Beck, Cohen Sutherland clipping, Polygon clipping: Hodgeman-Sutherland & Weiler-Atherton polygon clipping.
- UNIT III Curves and Surfaces:** Curve representation; Parametric Spline curve; Bezier Curve: parametric continuity(c0, c1, c2), Geometric continuity, Bernstein polynomials, Condition for smooth joining of 2 curve segments, Convex Hull property, B-Spline Curves: Knot vectors (uniform and open uniform curves, non uniform curve), basis function , Subdividing curves, Drawing curves using forward differences.
- UNIT IV Projection, Hidden Surface Elimination and Shading:** Parallel Projection: Orthographic , Axonometric and Oblique Projection; Perspective Projection : Vanishing point, 1,2 & 3 perspective projection; Hidden Surface Elimination: Back Face detection, Z-Buffer Algorithm, Painter Algorithm, Warnock's Algorithm. Illumination model for diffused & Specular reflection, Computing reflection vector, Gouraud and Phong Shading, Texture mapping: characteristics, parametric texture mapping, 2D texture mapping, Bump mapping, Lambert's cosine Law.
- UNIT V Fractals & Animation:** Fractals: self-similar fractals, fractal dimension, Generation of Terrain-random mid-point displacement, Self-squaring fractals. Solid Modelling: Generation through sweep techniques, Constructive solid geometry, B representations, Octrees, Ray Tracing & their Theory, Animation: Procedural animation, Morphing, Motion Control.

Text Books: -

1. Computer graphics, Hearn and Baker, PHI Publication
2. Computer Graphics, Madasu Hanmandlu, PBP Publication, 2005.

Reference Books:-

1. Computer graphics, Peter Shirley, Steve Marscher, Cengage publication, 2009.
2. Computer Graphics, D.A.Godse A.P.Godse, Technical Publications, 2009.
3. Computer Graphics : Multimedia and animation, Malay K. Pakhira . PHI.
4. Computer Graphics, Schoum Series, TMH Publication.
5. Computer Graphics and multimedia, G.S.baluja, Dhanpat Rai Publication

Chhattisgarh Swami Vivekanand Technical University, Bilai

Branch: **Information Technology**

Semester: **VI**

Subject: **Web Application Development Laboratory (PHP, My SQL, Ajax)**

Code: **333661 (33)**

Total Lab Periods: **36**

Batch Size: **30**

Maximum Marks: **40**

Minimum Marks: **20**

Suggested List of Experiments (but should not be limited to):

Client Side Scripting: JavaScript, AJAX:-

1. Introduction to Java Script
2. Java Script Simple Arithmetic
3. Pop-up Box usage
4. Introduction to DOM
5. Inbuilt objects and functions: Date, String, Math, Navigator, window etc.
6. Validations: Name, Pin, E-mail, Mobile No.,
7. Validations using Regular Expressions
8. Introduction to AJAX
9. AJAX for text and xml response.
10. Web and social integration i.e. Facebook widgets, Google widgets, Maps, Picasa Photo albums, You tube video albums, Twitter widgets, etc.

Server side Programming: PHP, J2EE, .Net

1. Introduction and working of server side program execution
2. Data types and Processing
3. Different Tags and Usage
4. Html Form request handling i.e. get and post
5. Login panel working
6. Data base connectivity
7. Session tracking and cookies
8. Dynamic content and page generation
9. Deployment of web application
10. Testing and solution for i.e. SQL Injection, code injection etc.

Books :

1. Ajax Bible-By Steve Holzner, 2007.
2. Head First Servlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates,O'Reilly Media Publishers
3. JavaScript Interactive Course – Techmedia
4. Head First PHP & MySQL-Lynn Beighley, Michael Morrison.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**

Semester: **VI**

Subject: **Software Engineering & Project Management
Laboratory**

Code: **333662 (33)**

Total Lab Periods: **36**

Batch Size: **30**

Maximum Marks: **40**

Minimum Marks: **20**

INSTRUCTIONS TO BE STRICTLY FOLLOWED BY STUDENTS:

1. Every two to three students should form a group and should develop software that could be developed during session.
2. Students can opt any Technology/Tool for developing their project
3. The groups should prepare a softcopy as well as hardcopy of the documentation as per phases given below.
4. Every student in the group should have a copy of the documentation
5. Every student should get his own copy of the documentation properly checked from the Teacher In charge, after every phase of development given below.
6. Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a Punched Cardboard File Only.
7. One CD of the project and its documentation (softcopy), from every group should be submitted during final submissions.
8. During Final Submissions, every copy of the documentation should be accompanied by a Submission Certificate duly signed by the Teacher In-charge and Head of Department

Suggested List of Experiments (but should not be limited to):

Experiment.1: Phases in software development project, overview, need, coverage of topics

Procedure:

1. Open an appropriate software engineering guide and study the software development life cycle and related topics.
2. Study the need of the software engineering.
3. Study the coverage of topics such as life cycle models and their comparisons.

Experiment.2: To assign the requirement engineering tasks.

Procedure:

1. Identify the different requirement engineering tasks.
2. Assign these tasks to various students to set the ball rolling.
3. Ask the students to start working on the given tasks.

Experiment.3: To perform the system analysis: Requirement analysis, SRS

Procedure:

1. Assign the group of the student's different tasks of system analysis.
2. Ask students to meet different users and start analysis the requirements.
3. Ask students to give presentations group-wise of their system requirements analysis.

Experiment.4: To perform the function oriented diagram: DFD and Structured chart

Procedure:

1. Identify various processes, data store, input, output etc. of the
2. Use processes at various levels to draw the DFDs.
3. Identify various modules, input, output etc. of the system.
4. Use various modules to draw structured charts.

Experiment.5: To perform the user's view analysis: Use case diagram

Procedure:

1. Identify various processes, use-cases, actors etc. of the
2. Use processes at various levels to draw the use-case diagram.

Experiment.6: To draw the structural view diagram : Class diagram, object diagram

Procedure:

1. Identify various elements such as classes, member variables, member functions etc. of the class diagram
2. Draw the class diagram as per the norms.

Name of the Programme: Bachelor of Engineering ::::: Duration of the Programme: Four Years

3. Identify various elements such as various objects of the object diagram
4. Draw the object diagram as per the norms.

Experiment.7: To draw the behavioral view diagram: Sequence diagram, Collaboration diagram

Procedure:

1. Identify various elements such as controller class, objects, boundaries, messages etc. of the sequence diagram
2. Draw the sequence diagram as per the norms.
3. Identify various elements such as for the sequence diagram of the collaboration diagram
4. Draw the collaboration diagram as per the norms.

Experiment.8: To draw the behavioral view diagram: State-chart diagram, Activity diagram

Procedure:

1. Identify various elements states and their different transition of the state-chart diagram
2. Draw the state-chart diagram as per the norms.
3. Identify various elements such as different activity their boundaries etc. of the activity diagram
4. Draw the activity diagram as per the norms.

Experiment.9: To draw the implementation view diagram: Component diagram.

Procedure:

1. Identify various elements of the component diagram such as the various components like client, server, network elements etc.
2. Draw the component diagram as per the norms.

Experiment.10: To draw the implementation view diagram: deployment diagram

Procedure:

1. Identify various elements such as the hardware components of the deployment diagram
2. Draw the deployment diagram as per the norms.

Experiment.11: To perform various techniques for testing using the testing tool: unit testing, integration testing

Procedure:

1. Identify various modules of the system so that they can be tested stand alone.
2. Identify the groups of the module that can be tested together in integration.
3. Perform the testing of the modules as a unit and in integration by using the testing tool.

Experiment.12: To draw UML diagrams.

Procedure:

1. Identify various elements of the system to be drawn using the IDE.
2. Draw the UML diagram as per the norms

REFERENCE BOOKS:

1. Fundamentals of Software engineering - Rajib Mall, 3rd ed.
2. Software design – From programming to architecture - Eric Braude
3. Object-oriented software engineering – A use case driven approach – Ivar Jacobson(Computer language productivity award winner)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Unix & Shell Programming Laboratory**

Semester: **VI**
Code: **333663 (33)**
Batch Size: **30**
Minimum Marks: **20**

Total Lab Periods: **36**
Maximum Marks: **40**

Note: Use Bash for Shell scripts.

List of Experiment to be performed

- Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
 - Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
- Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
 - Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
- Write a shell script to list all of the directory files in a directory.
 - Write a shell script to find factorial of a given integer.
- Write an awk script to count the number of lines in a file that do not contain vowels.
 - Write an awk script to find the number of characters, words and lines in a file.
- Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
 - Write a c program that makes a copy of a file using standard I/O and system calls.
- Implement in C the following Unix commands using System calls
 - cat, ls, mv
 - Write a C program to emulate the Unix ls -l command.
- Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
 - File type.
 - Number of links.
 - Time of last access.
 - Read, Write and Execute permissions.
- Write a C program to list for every file in a directory, its inode number and file name.
 - Write a C program that demonstrates redirection of standard output to a file. Ex: ls > fl.
- Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.
 - Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls -l | sort
- Write a C program to create a Zombie process.
 - Write a C program that illustrates how an orphan is created.
- Write C programs that illustrate communication between two unrelated processes using named pipe.
 - Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
 - Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (21)) and displays them.
- Write a shell script to accept three numbers and display the largest.
 - Write a shell script to find the number of files in a directory.
 - Write a shell script to display first ten positive numbers using until loop.
- Write a shell script to check if a particular user has logged in or not. If not, continue the loop till he/she logs in. Once the required user logs in, display a message.
 - Write a shell script to accept the name, grade, and basic salary from the user. Write the details into a file called employee, separating the fields with a colon (,) continue the process till the user wants.
- Write a shell script to check whether a file is existing or not.
 - Write a shell script to find the mode of a file in a directory.
 - Write a shell script which will accept different numbers and find their sum.
- Write a menu driven program to display a menu of options and depending upon the user's choice execute the associated command.
 - Write a shell script to calculate the total salary payable to all the employees from the employee file. The salary should be taken from the 8th field of the employee file.
- Write a shell script to copy the source file to the target file.
 - Write a shell script to print the first 10 odd numbers using the while loop.
 - Write a shell script to reverse the digits of a given number.

References:

- Unix Shell programming, Yashwanth Kanitkar, 1st Edition, BPB Publisher
- Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.
- Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
- The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

Name of the Programme: Bachelor of Engineering ::::: Duration of the Programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Computer Graphics & Animation Laboratory**
Total Lab Periods: **36**
Maximum Marks: **40**

Semester: **VI**
Code: **333664 (33)**
Batch Size: **30**
Minimum Marks: **20**

Suggested List of Experiments (but should not be limited to):

1. To study the different graphics functions supported by C / C++.
2. To practice the following line drawing algorithms:
 - a. Digital differential analyzer (DDA).
 - b. Bresenham's Algorithm.
3. To implement a circle using Midpoint algorithm.
4. To implement an ellipse using Midpoint algorithm.
5. To practice the following 2D transformation operations upon various 2D-polygons:
 - a) Translation.
 - b) Rotation.
 - c) Scaling.
 - d) Reflection.
6. To Practice the following filling (in Raster Graphics Display) upon various 2D-polygons:
 - a) Boundary-fill
 - b) Flood-fill.
7. To implement following line-clipping algorithms upon given line segments:
 - o Cohen-Sutherland's method
 - o Cyrus-Beck's method
8. To implement following polygon clipping algorithms upon various 2D-polygons:
 - o Hodgeman-Sutherland's method
 - o Weiler-Atherton's method
9. To Implement Bezier Curve.
10. To practice simple 2D figures: (smiles / icons / symbols) using graphics functions in 'C'.
11. To practice simple 2D moving objects (wheels / toys) using graphics functions in 'C'.
12. To practice simple 2D rotating objects (umbrella / celestial bodies / beyblades) using graphics functions in 'C'.
13. To practice coloring methods upon various closed polygons / open surfaces (country flags / flowers / toys) using graphics functions in 'C'.
14. To practice making of scenery-designs (houses / gardens / situations) using graphics functions in 'C'.
15. To practice animation techniques upon various moving entities using graphics functions in 'C'.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of Program:	Bachelor of Engineering	Semester:	VI
Branch:	Common to All Branches	Code:	300665 (76)
Subject:	Managerial Skills	Tutorial Period:	NIL
No. of Lectures:	2/Week	Marks in TA:	40
Total Marks in ESE:	NIL	Minimum number of Class Tests to be conducted:	Two

Objective:

The course is introduced to develop managerial skills tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Managerial skills are essential for overall professional development of an individual apart from gaining technical knowledge in the subject.

Course Objectives

Upon completion of this course, the student shall be able

- To define and explain the concept of managerial, written and oral communication skill;
- To understand the leadership skill;
- To develop self-appraisal and understand distinction between leader and manager;
- To develop positive attitude and thinking; and
- To understand managerial functions and develop creativity.

UNIT I Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

UNIT II Managerial skills - Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

UNIT III Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self-assessment.

UNIT IV Attitudinal Change: Concept of attitude through example, benefits of right attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate? How to build up self confidence?

UNIT V Creativity: Creativity as a managerial skill, Trying to get a grip on creativity. Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

Course Outcome

- The students will be able to develop formal and informal, negotiation, written and oral communication skill;
- The students will be able to develop manage groups, resolve conflicts and leadership skill and decision making qualities;
- The students will be able to develop self-appraisal, teaching, training and managing stress and time;
- The students will be able develop positive thinking, motivating team members and winning race; and
- The students will be able to develop creativity and fundamental management functions.

Text Books:

1. Basic Managerial Skills for all by E.H. Mc Grawth, Prentice Hall India Pvt Ltd,2006
2. Basic Employability Skills by P. B. Deshmukh, BSP Books Pvt. Ltd., Hyderabad, 2014

Reference Books:

1. How to develop a pleasing personality by Atul John Rego, Better yourself books, Mumbai,2006
2. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
3. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Digital Signal Processing
(Professional Elective – I)**

Semester: **VI**
Code: **333671(22)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**
ESE Duration: **Three Hours**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**
Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- This course introduces students to the fundamental techniques and applications of digital signal processing
- To develop skills for analyzing and synthesizing algorithms and systems that process discrete time signals, with emphasis on realization and implementation.

Course Outcome:

Upon completion of this course, students will be able to:

- Describe and analyze discrete time signals in the time domain and frequency domain.
- Apply digital signal processing techniques to analyze & design discrete time signals and systems
- Design and apply digital filters

- UNIT I DISCRETE-TIME SIGNALS:** Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, and energy and power theorems.
- UNIT II SAMPLING OF TIME SIGNALS:** Sampling theorem, application, frequency domain representation of sampling, and reconstruction of band limited signal from its samples. Discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.
- UNIT III Z-TRANSFORM:** Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.
- UNIT IV BASICS OF DIGITAL FILTERS:** Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite Impulse response (IIR) system. Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters: window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.
- UNIT V DISCRETE AND FAST FOURIER TRANSFORM DFT and FFT:** Discrete Fourier transforms properties of DFT, circular convolution, linear convolution using DFT, fast Fourier transform: Radix 2 FFT algorithm, decimation in time, decimation in frequency, bit reversal.

TEXT BOOKS:

1. Digital Signal Processing: Proakis and Manolakis; PHI, 5th Ed.
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya; TMH

REFERENCE BOOKS:

1. Digital Signal Processing: Alon V. Oppenheim; PHI
2. Digital Signal processing (II-Edition): Mitra, TMH

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Image Processing**
(Professional Elective – I)

Semester: **VI**
Code: **333672(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- to explore the basic idea about the pre processing operations for the image processing.
- to motivate our students to understand the different enhancement techniques for image processing.
- to explore the basic idea about the tools for the image processing.
- to motivate our students to understand their role play for the processing of images via communication systems.

Course Outcome:

- Students will be able to acknowledge about the different pre processing steps for image processing.
- Students will be able to acknowledge about the different tools used for image processing.
- Students will be able to understand the basic process of image compression techniques for image processing.
- They may go to choose their carrier in application development for image processing.

- UNIT I INTRODUCTION:** Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.
- UNIT II IMAGE ENHANCEMENT IN FREQUENCY DOMAIN & IMAGE SEGMENTATION:** 2D discrete fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.
- UNIT III MORPHOLOGICAL IMAGE PROCESSING:** Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.
- UNIT IV IMAGE COMPRESSION:** Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.
- UNIT V IMAGE REPRESENTATION & 3D:** Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Text Books:

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP ltd,

Reference books:

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Multimedia and Virtual Reality**
(Professional Elective – I)

Semester: **VI**
Code: **333673(33)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course objective:

- To understand the fundamental issues and problems in the representation, manipulation, and delivery of multimedia content particularly in a networked environment.
- To understand the concepts of multimedia components.
- To understand the concepts and application of Virtual Reality System,

Course Outcomes: Upon the completion of the course, the student should be able to:

- Know the fundamental video, audio, image, text processing techniques
- Acquire the basic skill of designing video compression, audio compression, image compression, text compression.
- Know the basic techniques in designing video transmission systems: error control and rate control
- Know the technologies related to virtual reality and application of virtual reality system.
- Familiar with VRML programming.

UNIT I INTRODUCTION: Concept of Multimedia, media & data stream, Main properties of multimedia system, Data stream characteristics of continuous media, multimedia Applications, Hardware and software requirements, Multimedia Products & its evolution.

UNIT II COMPONENTS OF MULTIMEDIA: Text, Basic sound concepts, MIDI, Speech, Basic concept of Images, Graphics format, Overview of image processing, Basic concepts of Video & animation, Conventional system, Transmission, Enhanced system, High Definition system, Computer based animation, Design & authoring Tools, Categories of Authority Tools, Types of products

UNIT III DATA COMPRESSION: Coding requirement, Source, entropy, hybrid coding, JPEG, MPEG, Text compression using static Huffmann technique, Dynamic Huffmann Technique, Statistical coding techniques.

UNIT IV OPTICAL STORAGE MEDIA: Videodisk and other WORMS, Compact Disk digital audio, Advantage of CD-DA Frames tracks blocks of CD-DA, CD-ROM, and Further CD-Rom based developments, Principles of CDWO, Prospects of CD technologies.

UNIT V VIRTUAL REALITY: Introduction to Virtual reality & Virtual reality Systems, Related Technologies: Tele-operation & augmented reality system VRML Programming, Domain Dependent Application like Medical, Visualisation Visibility computation Time Critical rendering.

TEXT BOOKS:

1. Multimedia System Design, Andleigh and Thakarakar, PHI, 2003.
2. Multimedia Technology & Application, David Hillman, Galgotia Publications.

REFERENCE BOOKS:

1. Multimedia Computing Communication and Application, Steinmetz, Pearson Edn.
2. Virtual Reality Systems, John Vince, Pearson Education.
3. Fundamentals of Computer Graphics and Multimedia, D.P. Mukherjee, PHI

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Inter Networking With TCP/IP**
(Professional Elective – I)

Semester: **VI**
Code: **333674(22)**

Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class Tests to be conducted: **2 (Minimum)** No. of assignments to be submitted: **One per Unit**
ESE Duration: **Three Hours** Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objectives:

- Understand the architecture of the Internet protocols as a layered model.
- Describe the functions implemented by each protocol, the design of the protocol and the characteristics of typical implementations.
- Analyze the relationships and dependencies between the protocols.

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

- Describe the architecture, design and behaviors of the internet and of the TCP/IP suite of protocols.
- Describe the concepts and techniques that have been used to design and implement the TCP/IP Internet technology
- Describe the issues that are driving the development of new protocols to broaden and enhance the operation of the Internet.

- UNIT I INTRODUCTION:** Introduction to internetworking, Overview of OSI Model TCP/IP protocol suite, Basics of switching technologies and switches, Comparisons of different models, Gateways.
- UNIT II INTERNET PROTOCOL:** Purpose of Internet Protocol, Internet datagram, Options, Checksum, ARP and RARP, Routing Methods: Routing Table and Routing module, ICMP, IGMP. **IP Addresses:** Introduction, Address Classification, A sample internet with classful addressing, Subnetting, Supernetting, Classless addressing, Security at the IP Layer, IPsec, IPv4 and IPv6 packet formats.
- UNIT III ROUTING PROTOCOLS: UNICAST ROUTING PROTOCOLS** Interior and Exterior routing, RIP, OSPF, BGP, **Multicasting:** Introduction, Multicast Routing, Multicast Routing Protocols, Multicast Trees, DVMRP, MOSPF, CBT, PIM, MBONE.
- UNIT IV TRANSPORT CONTROL PROTOCOL: TCP** TCP operation, Segment, Sliding window, Silly window, Options, TCP state machine, Karn's Algorithm, Congestion control- Leaky bucket and Token bucket algorithms. **UDP:** User Datagram, UDP operations, Checksum calculation.
- UNIT V TCP/IP OVER ATM NETWORKS:** ISDN and B-ISDN, ATM reference model, ATM Switch, Interconnection Network, Virtual circuit in ATM, Paths, Circuits and identifiers, ATM cell transport and adaptation layers, packet type and multiplexing, IP Address binding in an ATM Network, Logical Subnet Concept and Connection Management.

Text Books:

1. Internetworking with TCP/IP by Comer (Vol. 1)(PHI Pub.)
2. TCP/IP Protocol suite by Behrouz A. Forouzan.(TMH Pub.)

Reference Books:

1. Computer Networking by James F. Kurose, Keith W. Ross (Pearson Education)
2. TCP/IP Illustrated By Wright and Stevens (Vol.2) (Pearson Education)
3. An Introduction to Computer Networks by Kenneth C. Mansfield Jr. James L. Antonakes (PHI)

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Advanced Computer Networks**
(Professional Elective – I)

Semester: **VI**
Code: **333675(33)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- To expose students to the “full span” of the computer network’s frontier
- To encourage a performance perspective towards analysis of computer and communications networks
- The goal of this course is that the student will develop an understanding of the underlying structure of networks and how they operate.

Course outcome:

At the end of this course a student should be able to:

- Explain basic networking concepts by studying client/server architecture, network scalability, geographical scope, the Internet, intranets and extranets.
- Describe layered communication, the process of encapsulation, and message routing in network equipped devices using appropriate protocols.
- Design and build an Ethernet network by designing the subnet structure and configuring the routers to service that network.

UNIT I INTRODUCTION AND LAYERED NETWORK ARCHITECTURE: Messages and Switching, Layering, The Physical Layer: Channels and Modems. Error Detection, ARQ: Retransmission Strategies, Framing, Initialization and Disconnect for ARQ Protocols, Point-to-Point Protocols at the Network Layer, The Transport Layer.

UNIT II DELAY MODELS IN DATA NETWORKS: Queuing Models: Little’s Theorem. The $M / M / 1$ Queuing System, The $M / M / m$, $M / M / \infty$, $M / M / m / m$, and Other Markov Systems, The $M / M / 1$ System, Priority Queuing, An Upper Bound for the $G / G / 1$ System, The Klein rock Independence Approximation, Time Reversibility- Burke’s Theorem, Networks of Queues-Jackson’s Theorem, Extension of Jackson’s Theorem.

UNIT III MULTI-ACCESS COMMUNICATION: Introduction, Slotted Multi-access and the Aloha System, Splitting Algorithms: Tree Algorithms, First-Come First-Serve Splitting Algorithms, Carrier Sensing, Multi-access Reservations: Local Area Networks: Token Rings, High-Speed Local Area Networks, Packet Radio Networks.

UNIT IV ROUTING IN DATA NETWORKS: Introduction, Main Issues in Routing, Interconnected Network Routing: An Overview, Network Algorithms and shortest Path Routing: The Bellman-Ford algorithm, Bellman’s equation and shortest path construction, Dijkstra’s algorithm, The Floyd-Warshall algorithm. Broadcasting Routing Information: Coping with Link Failures, Flow Models, Optimal Routing, and Topological Design, Characterization of Optimal Routing, Feasible Direction Methods for Optimal Routing.

UNIT V FLOW CONTROL: Introduction, Window Flow Control: Node-by-Node Windows for virtual Circuits, Dynamic Window Size Adjustment. Rate Control Schemes, Rate Adjustment Algorithms, Max-Min Flow Control.

Text Books: -

1. Data Networks, Second Edition, By Bertsekas & Gallager ,(PHI)
2. Data Communication, Computer Networks & Open Systems, Fred Halsall, Pearson Education.

Reference Books: -

1. Data Networks, D.Bertsekas and R. Gailagher, PHI Second Ed.
2. Internetworking with TCP/IP, Vol. 1, D.E. Corner, and Prentice Hall India.
3. Computer Networking with IP, Stalling, Pearson Education.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Embedded & Real Time Operating Systems**
(Professional Elective – I)

Semester: **VI**
Code: **333676(33)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

No. of class Tests to be conducted: **2 (Minimum)**

No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objectives:

- to explore the basic idea about the modern hardware design using embedded concept.
- to motivate our students to understand their role play for the system design.
- to take an initiative for the development of dedicated operating system and application program for different system design.
- Summarize special concerns that real-time systems present and how these concerns are addressed.

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

- Students will be able to acknowledge about the embedded systems concept which is useful to design advance and dedicated systems for different purposes.
- They may go to choose their carrier in application development for these systems.
- Embedded Applications and Design Considerations.
- Envisaging the type of ES and selection of Components, kind of Programming required, Interfaces and inter component communication in real time Systems.

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS: An Embedded System, Processor in the System, Other Hardware Units, Software Embedded in to a System, Exemplary Embedded Systems, Embedded Systems On Chip and in VLSI Circuits. **Processor & Memory Organization:** Structural Units in a Processor, Processor Selection for an Embedded System, Memory Devices, Memory Selection for an Embedded Systems, Direct Memory Access, Interfacing Processor, Memories & I/O Devices.

UNIT II 8051 PROCESSOR: 8051 Processor Architecture And Instruction Set : The CPU, Addressing modes, external addressing, Interrupt handling, Instruction execution, Instruction set – data movement; arithmetic; bit operators; branch, Software development tools like assemblers; simulators; cross-compilers, O/P file formats. Hardware Features : 8051 – Device packaging, Chip technology, Power considerations, Reset, System clock/oscillators, Parallel I/O, Timers, Interrupts, Serial I/O, Control store and External memory devices.

UNIT III SOFTWARE DEVELOPMENT AND TOOLS: Embedded system evolution trends. Round - Robin, robin with Interrupts, function-One-Scheduling Architecture, Algorithms. Introduction to assembler- compiler-cross compilers and Intergrated Development Environment (IDE). Object Oriented Interfacing, Recursion, Debugging strategies, Simulators.

UNIT IV REAL TIME OPERATING SYSTEMS: Task and Task States, tasks and data, semaphores and shared Data Operating system Services-Message queues-Timer Function-Events-Memory Management, Interrupt Routines in an RTOS environment, basic design Using RTOS.

UNIT V DEVELOPMENT AND SUPPORT: Development tools and debugging:- Host and target machines, linker/locators, target system, testing, instruction set, assert macro. Establishing a software development environment C runtime environments Embedded debuggers Cross-development methods embedded file formats, readers Creating object files - the build process loading software into remote targets.

Text Books:-

1. “An Embedded Software Primer” by David E. Simon ISBN 0-201-61569-X
2. Embedded Systems – RajKamal, Tata Mc Graw Hill, India, 2005.

Reference Books:-

1. Real-Time Systems Design and Analysis, Phillip. A. Laplante, second edition, PHI, 2005.
2. Real-Time Systems Development, Rob Williams, Elsevier. 2006.
3. Real - Time Computer Control- An Introduction, Stuart Bennet, 2nd Edn. Pearson Education. 2005.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch: **Information Technology**
Subject: **Object Oriented Modeling & Design**
(Professional Elective – I)

Semester: **VI**
Code: **333677(22)**

Total Theory Periods: **40**
No. of class Tests to be conducted: **2 (Minimum)**

Total Tutorial Periods: **10**
No. of assignments to be submitted: **One per Unit**

ESE Duration: **Three Hours**

Maximum Marks in ESE: **80** Minimum Marks in ESE: **28**

Course Objective:

- Understand the basic steps of Object Oriented Analysis and Design.
- Gain practical knowledge in the UML diagrams and notations.
- Build an object-oriented model for a project using UML.

Course Outcome:

Upon completion of this course student will be able to-

- Understand basic object-oriented concepts for designing a solution.
- Apply an iterative, use case-driven process to the development of a robust design model.
- Use the UML to represent the design model.
- Apply the OO concepts abstraction, encapsulation, inheritance, hierarchy, modularity, and polymorphism to the development of a robust design model.
- Design a software system using object-oriented software engineering paradigm.

- UNIT I Introduction and Modeling Concepts: Introduction-** What is Object-Orientation?, What is Object-Oriented Development?, Object-Oriented themes, Evidence for usefulness of Object-Oriented Development, OO Modeling history. **Modeling Concepts:** Modeling as design technique- Modeling, Abstraction, The three Models. Class Modeling- Object and Class, Links and Associations Concepts. Generalization and Inheritance, A Sample Class Model, Navigation of Class Models. Advanced Class Modeling –Advanced Objects and Class Concepts, Association ends, N-array associations, Aggregation, Abstract Classes, Multiple Inheritance, Metadata, Reification, Constrains, Derived Data, and Packages.
- UNIT II State Modeling and Interaction Modeling:** State Modeling- Events and States, Transition & Conditions, State diagrams, State diagram behavior, Nested State diagrams, Concurrency. Advanced State Modeling- Nested State diagram, Nested States, Signal Generalization, Concurrency, A Sample State Model, Relation of Class and State Models. Interaction Model- Use Case Models, Sequence Models, Activity Models. Advanced Interaction Modeling- Use Case relationships, Procedural Sequence Models, Special Constructs for activity Models.
- UNIT III Analysis and Design:** Process Overview- Development Stages, Development Life cycle. System Conception- Developing a System concept, Elaborating a Concept, Preparing a Problem statement. Domain Analysis- Overview of Analysis, Domain Class Model, Domain State Model, Domain Interaction Model, Iterating and Analysis. Application Analysis- Application Interaction Model, Application Class Model, Application State Model, Adding Operations.
- UNIT IV System design and class Design: System design:** Overview of System Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Subsystems, Identifying Concurrency, Allocating Subsystems, Management of Data Storage, Handling Global Resources, Choosing Software Control Implementation, Handling Boundary Conditions, Setting Trade-off Priorities, Common Architectural Styles, Architecture of the ATM System.
Class design: Overview of Object Design, Bridging the gap, Realizing Use Cases, Designing Algorithms, Recursing Downward, Refactoring, Design Optimization, Reification of Behavior, Adjustment of Inheritance, Organizing a Class Design, ATM Example
- UNIT V Implementation:** Implementation Modeling- Overview of Implementation, fine-tuning classes, Fine tuning generalizations, realizing Associations, Testing. OO Languages- Introduction, Abbreviated ATM Model, Implementing Structure, Implementing Functionality. Databases- Introduction, Abbreviated ATM Model, Implementing Structure-basic and advanced, Implementing Structure for the ATM Example, Implementing functionality, OO Databases. Programming Style-OO Style, Reusability, Extensibility, Robustness, Programming in-the-large.

Text Books:

1. Object – Oriented Modeling and Design with UML, Michael R Blaha and James R Rumbaugh, 2nd Edition, Pearson Education, India.
2. Object oriented systems development, Ali Bahrami, McGraw-Hill Higher Education, 1999.

Reference Books:

1. Object Oriented Analysis & Design, Atul Kahate, Tata McGraw-Hill Education
2. Object-Oriented Analysis and Design with Applications, Third Edition, Grady Booch, Robert A. Maksimchuk Michael W. Engle, Bobbi J. Young, Ph.D., Jim Conallen, Kelli A. Houston

Name of the Programme: Bachelor of Engineering ::::: Duration of the Programme: Four Years

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of teaching and examination

B.E. VII Semester Information Technology

S.No	Board of Study	Subject Code	Subject ; Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Computer Sc. & Engg	333731(22)	Data Mining & Warehousing	3	1		80	20	20	120	4
2	Information Technology	333732(33)	Management Information System & IT	3	1		80	20	20	120	4
3	Computer Sc. & Engg	333733(22)	Artificial Intelligence & Expert Systems	3	1		80	20	20	120	4
4	Computer Sc. & Engg	322734(22)	Cryptography & Network Security	3	1		80	20	20	120	4
5	Refer Table-2		Professional Elective-2	4			80	20	20	120	4
6	Computer Sc. & Engg	333761(22)	Network Security Lab			4	40		20	60	2
7	Computer Sc. & Engg	333762(22)	Artificial Intelligence & Expert Systems Lab			4	40		20	60	2
8	Info. Technology	333763(33)	Andriod Lab			4	40		20	60	2
9	Info. Technology	333764(33)	Minor Project			5	100		40	140	3
10	Management	333765(76)	Innovative & Entrepreneurial Skills			2			40	40	1
11	Info. Technology	333766(33)	** Practical Training ** Evaluation / Library			1			40	40	1
			TOTAL	16	4	20	620	100	280	1000	31

L:Lecture

T:Tutorial

P:Practical

ESE: End Semester Examination

CT: Class Test

TA: Teacher's Assessment

Note 1: Duration of All theory papers will be of Three Hours

Note 2: ** To be completed after VI semester and before the commencement of VII Semester

Table-2: Professional Elective II

S. No.	Board of Study	Subject Code	Subject
1	Computer Science & Engg.	322740(22)	Digital Image Processing
2	Computer Science & Engg.	322741(22)	Advanced Computer Architecture
3	Computer Science & Engg.	322742(22)	Operation Research
4	Computer Science & Engg.	322743(22)	E-Commerce & Strategic IT
5	Computer Science & Engg..	322744(22)	Natural Languages Processing
6	Computer Science & Engg.	322745(22)	OODBMS
7	Computer Science & Engg.	322746(22)	Cloud Computing
8	Computer Science & Engg.	322747(22)	Grid Computing
9	Information Technology	333748(33)	Multimedia and Communication
10	Computer Science & Engg.	333749(22)	Wireless Networks
11	Computer Science & Engg.	333750(22)	Advanced Database Management System

Note (1)- 1/4th of total strength of students subject to Minimum strength of twenty students is required to offer an elective in the college in a particular academic session.

Note (2)- Choice of elective course once made for an examination cannot be changed for future examination.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Data mining and warehousing

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333731(22)

Total Tutorial Periods: 12

Minimum number of CT to be conducted: 02

Course objective:

- To understand the overall architecture of a data warehouse.
- The different data mining models and techniques will be discussed in this course.
- Evaluate different models used for OLAP and data pre-processing;
- Design and implement systems for data mining and evaluate the performance of different data mining algorithms;
- Propose data mining solutions for different applications.
- Differentiate Online Transaction Processing and Online Analytical processing

Unit-I: Overview and Concepts: Need for data warehousing, basic elements of data warehousing, Trends in data warehousing. Planning and Requirements: Project planning and management, Collecting the requirements. Architecture And Infrastructure: Architectural components, Infrastructure and metadata.

Unit-II: Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.

Unit-III: Information Access and Delivery: Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web. Implementation And Maintenance: Physical design process, data warehouse deployment, growth and maintenance.

Unit-IV: Data Mining: Introduction: Basics of data mining, related concepts, Data mining techniques Data Mining Algorithms: Classification, Clustering, Association rules. Knowledge Discovery: KDD Process.

Unit-V: Web Mining: Web Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal mining. Visualization : Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases Data Mining Primitives, Languages, and System Architectures: Data mining Primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems Application and Trends in Data Mining: Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining

Course outcome: After successful completion of this course students will be

- Design a data warehouse for an organization
- Develop skills to write queries using DMQL
- Extract knowledge using data mining techniques
- Adapt to new data mining tools.
- Explore recent trends in data mining such as web mining, spatial-temporal mining.

Text Books:

1. Data warehousing- concepts, Techniques, Products and Applications by Prabhu, Prentice hall of India
2. Insight into Data Mining: Theory & Practice by Soman K P, Prentice hall of India.
3. Data Mining Introductory and Advanced Topics by M.H. Dunham, Pearson Education.

Name of Reference Books:

1. Data Warehousing Fundamentals by Paulraj Ponniah, John Wiley.
2. Introduction to Data mining with Case Studies by Gupta, PHI.
3. The Data Warehouse Lifecycle toolkit by Ralph Kimball, John Wiley.
4. Introduction to Building the Data warehouse, IBM, PHI.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Branch: Information Technology

Subject: Management Information System and IT

Code: 333732(33)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Course Objectives:

- Understand the role of information systems for business and management;
- Understand the role of information technology for competitive advantage;
- Understand the role of the major types of information systems in a business environment and their relationship to each other;
- Understand the system lifecycle methodology and gain the knowledge about ethics for the computer users and laws;
- Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.

UNIT – I : Management Information System and System Concepts:

Management Information System: What is MIS ? Concept of Organizational Information Subsystems, Report Writing Software, Mathematical Modeling, Simulation, Graphical Output, MIS and Human Factors Considerations, MIS and Problem Solving. **Systems Concepts:** Models, General Systems Model, Environment, Systems Approach.

UNIT -II: CBIS, Information System for competitive advantage & computer use in an international market:

Computer-Based Information System: Information Management, Who are the Information Users ? The Manager and Systems, Data Versus Information, Evolution of CBIS, Model Of CBIS, Trend to End User Computing, Justifying the CBIS, Achieving the CBIS, Re-engineering the CBIS, Managing the CBIS. **Information Technology For Competitive Advantage :** Firm in its environment, Competitive Advantage, What are the information resources ? Who manages the information Resources ? Strategic Planning for the Enterprise, Strategic Planning for Information Resources. End-User Computing as a Strategic Issue, Information Resource Management Concept. **Computer Use in an International Market Place :** Multinational Corporation, Special Need for Coordination in an MNC, Global Business Strategies, Global Business Drivers, Problems in Implementing GIS, GIS implementation Strategies, Computing Around the World.

UNIT-III: Organization Information Systems: Accounting Information System, Decision Support Systems, Executive Information System, Marketing Information Systems, Financial Information System, Human Resource Information System

UNIT-IV: System lifecycle methodologies, information resources, Computer Crime, Ethics & Social Issues.

System Lifecycle Methodologies: The System Life Cycle, The Planning Phase, The Analysis Phase, The Design Phase, The Implementation Phase, The Use Phase, Prototyping, Rapid Application Development, Business Process Redesign. **Information Resources Information Systems :** The Information Services organization, A Model of an Information Resources Information System, CIO Responsibilities, Achieving Quality Management in Information Services, Systems Security, Contingency Planning, Information Management Cost Reduction Strategies. **Computer Crime, Ethics, and Social Issues :** Morals, Ethics and the Law, Need for an Ethics Culture, Ethics for Computer Users, Ethics for Computer Professionals, Ethics for Business, Ethics and Information Services, Social Rights and the Computer, Codes of Ethics, Ethics and Information Specialists, Ethics and the CIO, Controlling Prewritten Software, Plagiarism, Ten Commandments of Computing, A Personal Ethics Guidelines.

UNIT-V: Case Studies: Study, Analysis, and Design of the following Management Information Systems...

1. Payroll Management System
2. Inventory Control Management System e.g. Medical Shop
3. Library Management System
4. University Result Management System

Finalizing Inputs, Processes, and Outputs. Organization of inputs, design of output formats. Finalizing Data Entry modules(AA-Add After, IN-Inquire, DL-Delete, UP-Update, LI-List, PR-Print, EX-Exit), Menus, Sub Menus, etc. Finalizing the Processing modules, their workings, Menus, Sub Menus, etc. Use of techniques viz. IPO charts, HIPO charts, Decision tables, Flow Charts, etc. is expected.

(Note : The teachers and students should perform the Study, Analysis, and Design. They should study the relevant written and non written rules and regulations e.g. Service rules, Manuals, Ordinances, etc. They should download the relevant material from the Internet)

Course Outcomes: At the completion of the course student will be able to -

- Describe the basic concepts and technologies used in the field of management information systems;
- Identify the different types of management information systems;
- Explain the ethical, social, and security issues of information systems;
- Describe the role of information systems in organizations, the strategic management processes, and the implications for the management;
- Describe about the importance of managing organizational change associated with information systems implementation;
- Describe the practical approach of developing and implementing information systems.

Text Books:

1. Management Information Systems, International Edition, Raymond McLeod, Jr. and George Schell (Prentice Hall)
2. Management Information Systems, Suresh K. Basandra (A. H. Wheelers, Publishing Company Limited)

Reference Books:

1. Introduction to Computer Information System for Business, Mark G. Simkin. S. Chand Co., 1996.
2. Analysis & Design of Information Systems, James A. Senn. MC Graw-Hill International edition, 1989.
3. Analysis and Design of Information System , V. Rajaraman(PHI)

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: **VII**

Subject: **Cryptography and Network Security**

Total Theory Periods: **40**

Total Marks in End Semester Exam: **80**

Minimum number of class tests to be conducted: **02**

Branch: **Information Technology**

Code: **322734(22)**

Total Tutorial Periods: **12**

Assignments: **1 per Unit**

Course Objective:

- To understand the principles and practices of cryptography and network security
- To understand the practical applications that have been implemented and are in use to provide network security

UNIT I: Overview: Security trends, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security. **Symmetric (Private Key) Ciphers: Classical Encryption Techniques:** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography. **Block Ciphers and the Data Encryption Standard:** Block Cipher Principles, The Data Encryption Standard (DES), The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles.

UNIT II: Symmetric Ciphers (continued): Basic Concepts in Number Theory and Finite Fields: Groups, Rings, and Fields, Modular Arithmetic, the Euclidian algorithm, Finite Fields of the Form $GF(p)$, Polynomial Arithmetic, Finite Fields of the Form $GF(2^n)$. **Advanced Encryption Standard:** The Origins AES, Evaluation criteria for AES, the AES Cipher. **Stream cipher:** Stream ciphers and RC4. **Confidentiality using symmetric encryption:** Placement of encryption function, traffic confidentiality, key distribution.

UNIT III: Asymmetric (Public Key) Ciphers: Introduction to Number Theory: Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms. **Public-Key Cryptography and RSA:** Principles of Public-Key Cryptosystems. **Key Management-Other Public-Key Cryptosystems:** Key management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

UNIT IV: Asymmetric Ciphers (continued): Message Authentication and Hash functions: Message authentication requirements, authentication functions, Message authentication codes, Hash functions, Security of Hash functions and MAC, SHA, HMAC, CMAC. **Digital Signatures and Authentication protocols:** Digital signature, Authentication protocols, Digital signature standards,

UNIT V: Network Security applications: Authentication applications: Kerberos, X.509 Authentication services, Public key infrastructure. **Electronic mail security:** PGP, S/MIME. Overview of IP Security. **Web Security:** Web security considerations, SSL and TLS, Secure electronic transaction. **System Security:** Intruders, Intrusion detection, password management, viruses and related threats, virus counter measures, Firewall design principles, and trusted systems.

Course Outcome: after successful completion of this course, the students will be able to explain

- Conventional encryption algorithms for confidentiality and their design principles
- Public key encryption algorithms and their design principles
- Use of message authentication codes, hash functions, digital signature and public key certificates
- Network security tools and applications
- System-level security issues like threat of and countermeasures for intruders and viruses, and the use of firewalls and trusted systems.

Text Book:

1. William Stallings, "Cryptography and Network Security, Principles and Practices", Pearson Education, Prentice Hall, 4th Edition.
2. Cryptography and Network Security, Atul Kahate, McGraw Hill Education (India) Private Limited; Third edition.

Reference books:

1. Applied Cryptography: Protocols & Algorithms, Schneier & Bruce, MGH International.
Cryptography and Security – by Dr T R Padmanabhan N Harini, Wiley India Pvt Ltd, 2011.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Branch: Information Technology.

Subject: Artificial Intelligence & Expert Systems

Code: 333733(22)

Total Theory Periods: 40

Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80

Minimum number of CT to be conducted: 02

Course objective:

- Introduce the basic principles of AI towards problem solving, inference, perception, knowledge representation and learning.
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural Networks and other machine learning models.
- Experiment with a machine learning model for simulation and analysis.
- Explore the current scope, potential, limitations, and implications of intelligent systems.
- To have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.

UNIT I Overview & Search Techniques:

Introduction to AI, Problem Solving, State space search, Blind search: Depth first search, Breadth first search, Informed search: Heuristic function, Hill climbing search, Best first search, A* & AO* Search, Constraint satisfaction. Game tree, Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.

UNIT II Knowledge Representation (KR):

Introduction to KR, Knowledge agent, Predicate logic, WFF, Inference rule & theorem proving forward chaining, backward chaining, resolution; Propositional knowledge, Boolean circuit agents.

Rule Based Systems, Forward reasoning: Conflict resolution, backward reasoning: Use of Back tracking, Structured KR: Semantic Net - slots, inheritance, Frames- exceptions and defaults attached predicates, Conceptual Dependency formalism and other knowledge representations.

UNIT III Handling uncertainty & Learning:

Source of uncertainty, Probabilistic inference, Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN), Inference with BBN, Dempster-Shafer Theory, Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning: Dependency directed backtracking, Truth maintenance systems. Learning: Concept of learning, Learning model, learning decision tree, Paradigms of machine learning, Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.

UNIT IV Natural Language Processing (NLP) & Planning:

Overview of NLP tasks, Parsing, Machine translation, Components of Planning System, Planning agent, State-Goal & Action Representation, Forward planning, backward chaining, Planning example: partial-order planner, Block world.

UNIT V Expert System & AI languages:

Need & Justification for expert systems- cognitive problems, Expert System Architectures, Rule based systems, Non production system, knowledge acquisition, Case studies of expert system. Ai language: Prolog syntax, Programming with prolog, backtracking in prolog, Lisp syntax, Lisp programming.

Course outcome: After successful completion of the course, students will be able

- Demonstrate fundamental understanding of artificial intelligence (AI) and expert systems.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency in applying scientific method to models of machine learning.

Text Books:-

1. Artificial Intelligence by Elaine Rich and Kevin Knight, Tata McGraw Hill.
2. Introduction to Artificial Intelligence and Expert Systems by Dan W.Patterson, Prentice Hall of India.

Reference Books :-

1. Principles of Artificial Intelligence by Nils J.Nilsson, Narosa Publishing house.
2. Programming in PROLOG by Clocksin & C.S. Melish, Narosa Publishing house.
3. Rule based Expert Systems-A practical Introduction by M. Sasikumar, S.Ramani, et. al., Narosa Publishing House.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C. G.)**

Semester: **VII**
Subject: **Network Security Lab**
Total Practical Periods: **42**
Total Marks in End Semester Exam: **40**

Branch: **Information Technology.**
Code: 333761(22)
Duration of period: 50 minutes
Number of Periods per Week: 3

Course Objectives:

- To understand the fundamentals of Cryptography through practical implementation.
- To implement standard algorithms used to provide confidentiality, integrity and authenticity.
- To understand the various key distribution and management schemes.
- To understand how to use cutting edge simulation tools
- To design security applications in the field of Information technology.

The following exercises are based on the cryptographic algorithms. They can be implemented using C, C++, Java, etc. However the students are advised to use Java cryptographic packages to implement the programs in UNIX environment. Minimum 12 experiments should be performed.

1. Write a C program that contains a *string*(char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a *string*(char pointer) with a value 'Hello world'. The program should
 - a. AND and
 - b. XOREach character in this string with 127 and display the result.
3. Write a Java program to perform encryption and decryption using the following algorithms
 - a. Ceaser cipher
 - b. Substitution cipher
 - c. Hill Cipher
4. Write a C/Java program to implement the 8 bits simplified DES algorithm logic
5. Write a C/Java program to implement the Blowfish algorithm logic.
6. Write the RC4 logic in Java
7. Implement the Euclid Algorithm to generate the GCD of an array of 10 integers in 'C'.
8. Implement Rabin-Miller Primality Testing Algorithm.
9. Write a Java program to implement RSA algorithm.
10. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
11. Write a Java program to calculate the message digest of a text using the SHA-1 algorithm.
12. Calculate the message digest of a text using the MD5 algorithm in JAVA.
13. Create a digital certificate of your own by using the Java keytool.
14. Write Java program to hide of confidential information within Image using Steganography technique
15. Configure a firewall to block the following for 5 minutes and verify the correctness of this system using the configured parameters:
 - a. Two neighborhood IP addresses on your LAN
 - b. All ICMP requests
 - c. All TCP SYN Packets

Course outcome: Students will be able to

- Develop programs to implement various encryption and decryption techniques.
- Develop programs to implement symmetric and asymmetric key crypto system.
- Develop programs to implement message authentication codes, digital signature.
- Use the cryptographic packages available in JDK.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C. G.)**

Semester: **VII**

Subject: **Artificial Intelligence & Experts Systems Lab**

Total Practical Periods: **42**

Total Marks in End Semester Exam: **40**

Course Objectives:

Branch: **Information Technology.**

Code: 333762(22)

Duration of period: 50 minutes

Number of Periods per Week: 3

Suggested List of Experiments (but should not be limited to):

1. Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle, aunt, ancestor given the facts about father and wife only.
2. Write a program to find the length of a given list
3. Write a program to find the last element of a given list
4. Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
5. Write a program to find union and intersection of two given sets represented as lists.
6. Write a program to read a list at a time and write a list at a time using the well defined read & write functions.
7. Write a program given the knowledge base,
If x is on the top of y, y supports x.
If x is above y and they are touching each other, x is on top of y.
A cup is above a book. The cup is touching that book. Convert the following into wff's, clausal form; Is it possible to deduce that 'The book supports the cup'.
8. Write a program given the knowledge base,
If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.
If Town x is connected to y by z then y is also connected to x by z.
If you can get to town q from p and also to town r from town q, you can get to town r from town p.
Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.
Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4.
Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.
Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following into wff's, clausal form and deduce that 'One can get to town B from town D'.
9. Solve the classical Water Jug problem of AI.
10. Solve the classical Monkey Banana problem of AI.
11. Solve the classical Crypt arithmetic problems such as DONALD + GERALD = ROBERT of AI.
12. Solve the classical Missionary Cannibals problem of AI.
13. Solve the classical Travelling Salesman Problem of AI.
14. Solve the classical Blocks World Problem of AI.
15. Write a program to search any goal given an input graph using AO* algorithm.

List of Equipments/Machine required :

- (i) PC with Windows xp
- (ii) Visual prolog compiler

Recommended Books :

1. Ivan Bratko : Logic & prolog programming.
2. Carl Townsend : Introduction to Turbo Prolog, BPB, Publication.
3. W.F. Clocksin & Mellish : Programming in PRLOG, Narosa Publication House.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: VII
Subject: **Android Lab**
Total practical Periods: 42

Branch: **Information Technology.**
Code: **333763(33)**
Total Marks in End Semester Exam: 40

Course objective:

- Understanding the working of Android applications
- To learn how to create GUI and handle events in Android applications.
- Understanding development of applications with data storage, APIs and Databases

Suggested List of Experiments (but should not be limited to)

1. Download and setup Android Environment
2. Using the Development environment
 - a. Create a new Project using wizard
 - b. Add source and resource files.
 - c. Import existing projects into workspace
 - d. Create testing Emulator
 - e. Compile and run the project
 - f. Debug the project
 - g. Debug on android device.
3. XML Files
 - a. AndroidManifest.xml
 - a.i. Edit the manifest and change min sdk and target sdk of application.
 - a.ii. Add main activity entries in manifest.
 - a.iii. Add second activity entries in manifest.
 - a.iv. Add Entries for Service, Broadcast receivers.
 - a.v. Add uses permissions for reading files, internet, camera.
 - b. Layouts
 - b.i. Create Linear Layout in xml
 - b.ii. Create Relative Layout in xml
 - b.iii. Create frame layout in xml
 - b.iv. Create a complex mixed layout using all above layouts
 - c. Drawables
 - c.i. Create xml drawable for rectangular, oval and other basic shapes
 - c.ii. Create xml drawable with Layer list for complex shapes.
 - d. Values
 - d.i. Create strings.xml to store all your application strings.
 - d.ii. Create color.xml to store all your color values
 - d.iii. Create styles.xml to store all your custom themes and style objects
 - e. Alternate resources based on qualifiers
 - e.i. Create separate drawables folders and xml files based on screen density (LDPI, MDPI, HDPI, XHDPI, XXHDPI)
 - e.ii. Create separate styles.xml based on different android versions.
 - e.iii. Create separate layout folders based on device screen sizes and orientations.
4. Creating User Interface
 - a. Create application with Basic Views (Textview, Button, ListView)
 - b. Create application with different Layouts (Linear, Relative, Frame)
 - c. Create application to handle and respond on click using Click Listeners
5. Assets and Images
 - a. Create application which will access files from Assets folder (Images, sounds, Custom Fonts)

6. Application Fundamentals
 - a. Activities
 - a.i. Create application with one activity and display a layout created in xml.
 - a.ii. Create application which will log all activity lifecycle events using Android log api.
 - a.iii. Create application which should be Saving and restoring app state (eg textview text, checkbox checked state)
 - b. Intents
 - b.i. Create application which will start another activity using intent.
 - b.ii. Create an activity which will pass data to second activity using intent.
 - b.iii. Create activity which will start second activity and get response back from second activity.
 - c. Services
 - c.i. Create
7. Content Providers
 - a. System provided content providers
 - a.i. Create application which can access/modify Contacts of device.
 - a.ii. Create application which can access & display Images available on device.
 - a.iii. Create application which can access and play Media files (Audio & Video)
 - b. Custom Contact providers
 - b.i. Create application which will provide some data to other applications using ContentProvider system.
8. Broadcast Receivers
 - a. Create application to Listen to following system events using Receivers
 - a.i. Incoming SMS
 - a.ii. In and outgoing Phone Call
 - a.iii. Low Battery
 - a.iv. Storage state changed
 - b. Create application which will broadcast Custom event to custom Receivers.
9. Create application which will display following Notifications
 - a.i. Toast notification
 - a.ii. Status bar notification
 - a.iii. Dialog notification
10. Preference & Data Storage
 - a. Create application which will save and read back data using Shared Preference
 - b. SQLite database
 - b.i. Create app to create database using Open helper
 - b.ii. Create app to read, write and delete database entries
11. Networking & Web API
 - a. HTTP connectivity
 - a.i. Create app to connect and fetch data from a Http server/ website using URLConnection
 - a.ii. Create app to connect and fetch data from a Http server/ website using HTTPClient library
 - a.iii. Create app to connect and post data to Http server/ website using URLConnection
 - a.iv. Create app to connect and post data to Http server/ website using HTTPClient library
 - b. TCP Sockets or Sockets
 - b.i. Create a server app using tcp socket, it will send "Welcome" to client when its connected.
 - b.ii. Create a client app using tcp socket, it will send "Hello" to server once connected.
12. Google API
 - a. Create application using Maps api, it should display marker on current location of user
 - b. Create application which will display ads using Admob api
13. Accessing android hardware
 - a. Create Application to take picture and save it to file storage using camera api
 - b. Create application to display current direction using sensor api
 - c. Create application to show a toast if phone is waved in air.
 - d. Create application to show list of paired and nearby bluetooth devices.
14. Facebook SDK

- a. Create application which can share link on facebook using Facebook sdk.
 - b. Create application which can share photo on facebook using Facebook sdk.
15. Publish to playstore
- a. Enable Obfuscation for your application using Proguard
 - b. Export Signed application package
 - c. Prepare Store listing
 - d. Upload and publish apk

COURSE OUTCOMES: Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

- Understands basic concepts and technique of developing applications for the Android phone.
- Able to use the SDK and other development tools.
- Acquaintances with how to publish Android applications to the Android Market.

Reference Books:

Head First Android- By Jonathan Simon

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Digital Image Processing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology

Code: 322740(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- Cover the basic theory and algorithms that are widely used in digital image processing
- Expose students to current technologies and issues that are specific to image processing systems
- Develop hands-on experience in using computers to process images
- Develop critical thinking about shortcomings of the state of the art in image processing

UNIT I: Introduction:

Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.

UNIT II: Image Enhancement in Frequency Domain & Image segmentation :

2D discrete Fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

UNIT III: Morphological Image Processing:

Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.

UNIT IV: Image compression:

Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

UNIT V: Image representation & 3D:

Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Outcomes: After successful completion of the course, student will be able to

- Describe, analyze and reason about how digital images are represented, manipulated, encoded and processed, with emphasis on algorithm design, implementation and performance evaluation.
- Apply principles and techniques of digital image processing in applications related to digital imaging system design and analysis.
- Analyze and implement image processing algorithms.

Name of Text Books:-

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP Ltd,

Name of Reference Books:-

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII
Subject: Advanced Computer Architecture
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322741(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective

- To provide in-depth coverage of current and emerging trends in computer architectures, focusing on performance and the hardware/software interface.
- To analyzing fundamental issues in architecture design and their impact on application performance.

UNIT I: Pipeline:

Linear: pipeline processor, Non linear pipeline processor, Instruction pipeline design, Mechanisms, Dynamic instruction scheduling, Arithmetic pipeline design, Super-scalar processors, VLIW architecture.

UNIT II: Memory Hierarchy and I/O Organization ON:

Cache memories, Cache coherence, High bandwidth memories, High bandwidth I/O, Disk I/O, Bus specifications and standards.

UNIT III: Parallel Computer Models & Program Parallelism:

Classification of Machines, SISD, SIMD & MIMD, Condition of parallelism, data and resource dependencies, Program partitioning & scheduling, grain size latency, control flow versus data control, data flow architecture.

UNIT IV: synchronous Parallel processing :

Vector instruction types, vector access memory schemes, vector and symbolic processors, SIMD architecture, SIMD parallel algorithms, SIMD computers and performance enhancements.

UNIT V: System Interconnection:

Network properties and routing, static interconnection networks, dynamic interconnection networks, Multiprocessor system interconnection, Multistage & combining networks.

Course Outcomes: After successful completion of this course, students will be

- Discuss the organization of computer-based systems and how a range of design choices are influenced by applications
- Differentiate different processor architectures and system-level design processes.
- Understand the components and operation of a memory hierarchy and the range of performance issues influencing its design.
- Understand the organization and operation of current generation parallel computer systems, including multiprocessor and multi core systems.
- Understand the principles of I/O in computer systems, including viable mechanisms for I/O and secondary storage organization.

Text Books:-

1. Flynn Computer Architecture: Pipelined and parallel processor design, JB, Boston.
2. Computer Architecture & Parallel processing - Kai Hwang 7 Briggs. (MGH).

Reference Books:-

1. Parallel Computer 2 –Arch.& Algo, R.W. Hockney, C.R. Jesshope, Adam Hilger.
2. Advanced Computer Architecture with Parallel Programming, K. Hwang, MGH.
3. Parallel Computing, Theory and Practice, Michel J. Quinn, MGH.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Multimedia & Communications

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333748(33)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objectives:

- To discuss the technical details of common multimedia data formats, protocols, and compression techniques of digital images, video and audio content.
- To describe and understand the technical details of JPEG and MPEG families of standards.
- To discuss the significance of “Quality of Service” in multimedia networking.
- To describe the principles and technical details of several wired and wireless networking protocols.
- Develop simple but demonstrative multimedia applications using JAI and JMF.

UNIT-I: Introduction: Concept of Non-Temporal and Temporal Media. Basic Characteristics of Non-Temporal Media; Images, Graphics, Text. Basic Characteristics of Temporal Media: Video, Audio, Animation. Hypertext and Hypermedia. Presentations: Synchronization, Events, Scripts and Interactivity, Introduction to Authoring Systems.

UNIT-II: Compression Techniques:

Basic concepts of compression, still image Compression. JPEG Compression. Features of JPEG2000. Video Compression: MPEG- 1&2 Compression Schemes, MPEG-4 Natural Video Compression. Audio Compression: Introduction to speech and Audio Compression, MP3 Compression Scheme. Compression of synthetic Graphical objects.

UNIT-III: Multimedia System Architecture:

General Purpose Architecture for Multimedia Support: Introduction to Multimedia PC/Workstation Architecture, Characteristics of MMX instruction set, I/O systems: Overview of USB port and IEEE 1394 Interface, Operating System Support for Multimedia Data: Resource scheduling with real-time Considerations, File System, I/O Device Management.

UNIT-IV: Multimedia Information Management:

Multimedia Database Design, Content Based Information Retrieval: Image Retrieval, Video Retrieval, Overview of MPEG-7, Design of video- on-Demand Systems

UNIT-V: Virtual Reality:

Introduction to Virtual Reality and Virtual Reality Systems, Related Technologies: Tele-operation and Augmented Reality Systems Interface to the Virtual World-Input; Head and hand trackers, data globes, haptic input devices. Interface to the Virtual World- Output, Stereo display, head-mounted display, auto stereoscopic displays, holographic displays, haptic and force feedback. VRML Programming; Modeling objects and virtual environments Domain Dependent applications: Medical, Visualization, Entertainment etc.

Course Outcome: After successfully completing this course, students will be able to develop a thorough understanding of the major aspects of technical details of multimedia data representation, and multimedia content delivery platforms. The techniques and understandings will support proper evaluation, development, and enhancement of distributed multimedia applications.

Text Book:-

1. Multimedia Technology, TAY Vaughan, McGraw-Hill
2. Multimedia Concept & Practice, Hartman & Carey, PHI
3. Virtual Reality Systems, John Vince, Addison Wesley.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Wireless Networks

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333749(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- Understand the architecture and applications of current and next generation wireless networks: Cellular, WLANs, sensor networks, mobile ad-hoc networks and intermittently connected mobile networks.
- Learn how to design and analyze various medium access and resource allocation techniques wireless networks.
- Learn to design and analyze transport layer protocols, with an emphasis on congestion control, including TCP over wireless, congestion sharing mechanisms, explicit and precise rate control, utility optimization-based approaches, and backpressure-based utility optimization.

UNIT-1

Wireless Communication Standard-First, Second and Third Generation Wireless Communication Network, Coverage Extension, Types; Characterization of Wireless Channels- multipath Propagation, Linear Time Variant, Channel Model, Channel Correlation Function, Large Scale Path Loss and Shadowing, Fading.

UNIT-2

Bandpass Transmission Technique for Mobile Radio- Signal Space and Decision Region, Digital Modulation-MPSK, MSK, GMSK, OFDA, Power Spectral Density, Probability of Transmission Error; Receiver Technique for Fading Dispersive Channels.

UNIT-3

CELLULAR COMMUNICATION-Frequency reuse and mobility Management, Cell Cluster Concept, Co Channel and Adjacent Channel Interference, Call Blocking and Delay at Cell Site, Cell Splitting, Sectoring;

UNIT-4

Multiple Access Technique, Random Access, Carrier Sense Multiple Access(CSMA), Conflict Free Multiple Access Technology and Spectral Efficiency-FDMA, TDMA, CDMA; Mobility management and In wireless network-CAC, Handoff Management, Location Management for Cellular Network and PCS network, Traffic calculation.

UNIT-5

Wireless Internetworking-Mobile IP , Internet Protocol (IP), Transmission Control Protocol (TCP), Network Performance, Wireless Application Protocol(WAP) , Mobile AD HOC Network

Course outcome:

- Have knowledge and understanding of basic mobile network architecture
- Have knowledge and understanding of some basic technologies that are in use
- Be able to make critical assessment of mobile systems
- Be able to analyze and propose broad solutions for a range of mobile scenarios

Text Books:1

1. WIRELESS COMUNICATION & NETWORKING by Mark & Zuang , PHI
2. Wireless Communications And Networks, WILLIAM STALLINGS , PHI

Reference Books:

1. Wireless Network Performance Handbook , by SMITH , McGraw- Hill
2. Principles Of Wireless Networks, By PAHLAVAN , PHI

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C. G.)**

Semester: **B.E. 7th**
Subject: **Advanced Database Management Systems**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **80**
Minimum number of class tests to be conducted: **02**

Branch: **Information Technology.**
Code: 322750(22)
Total Tutorial Periods:
Assignments: **1 per Unit**

Course Objective

- Introduce basic concepts and major techniques in DBMS implementations. These include concepts and techniques for data storage, query processing, and transaction management.
- Introduce research development ability in databases.

UNIT- I DISTRIBUTED DATABASE DESIGN: Design strategies, Distribution design issues, Fragmentation, Allocation, Oracle DDB design, Distributed database system architecture, Date's rule for DDBS.

UNIT- II DATA REPLICATION & QUERY PROCESSING IN DDBS : Classification of replica control strategies, Consistency & Request ordering, The Gossip Architecture, Process groups & ISIS, Replication in Oracle, Query optimization in Centralized system, Objective of query processing, Query decomposition, Distributed query optimization algorithms, Query optimization in Oracle.

UNIT-III TRANSACTION PROCESSING & RECOVERY: Centralized & client server architecture, server systems architectures, parallel & distributed systems, distributed data storage, Transaction property, distributed transactions, commit protocols, concurrency control in distributed database, availability, heterogeneous distributed databases, Distributed deadlock management, recovery concepts, recovery techniques based on deferred update & on immediate update shadow paging, The ARIES Recovery Algorithm, Recovery in multi-database systems, database backup and recovery from catastrophic failures, Reliability concept & measure, Site failure & network partitioning, directory systems, Database recovery in Oracle.

UNIT- IV SECURITY MANAGEMENT & PL/SQL: Various aspect of database security, Basic model of database access control, TCSEC Policy identification, Security models, Identification-Authentication- Authorization, Statistical databases, Data encryption, Security in Oracle, JDBC, Purpose of PL/SQL, PL/SQL block, structure & type, PL/SQL syntax & programming.

UNIT-V DIFFERENT DATABASES: Parallel databases: Introduction, I/O parallelism. Interquery-intraquery-intraoperation interoperation parallelism design of parallel systems. Client/Server DBS, Oracle DBMS, Distributed processing in Oracle, Oracle network protocols, Network administration in Oracle. Theory of OO databases, Multimedia databases, Real time databases.

Course Outcome:

Upon completion of this course, students should be able to:

- Explain in detail DBMS architecture.
- Explain in detail query processing and techniques involved in query optimization.
- Explain the principles of concurrency control and recovery management.
- Explain the Security management in Databases

Text book:

1. Database system concepts , 4th edition, Silberschatz-Korth-Sudarshan, MH
2. Fundamentals of database systems 3rd edition, Elmasri & Navathe, Pearson education

References:-

1. Database concepts & systems ,2nd edition , Ivan Bayross, SPD
2. Database Management System, Rajesh Narang, PHI.
3. An Introduction to database systems, 7th edition, C.J. Date , Pearson education

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Operation Research

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322742(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- To introduce use quantitative methods and techniques for effective decisions-making; model formulation and applications those are used in solving business decision problems.
- To model decision making problems using major modeling formalisms of artificial intelligence and operations research, including propositional logic, constraints, linear programs and Markov processes,
- To evaluate the computational performance of search, satisfaction, optimization and learning algorithms.
- To apply search, satisfaction, optimization and learning algorithms to real world problems.

UNIT –1 Linear Programming: LP formulations, Graphical method for solving LP with 2 variables, Simplex method, Application of simplex method for maximization and minimization of LP problems, Artificial variable technique for finding the initial basic feasible solution, The Big-M method, Degeneracy in simplex method, Duality theory in LP, Dual simplex method.

UNIT-2: Transportation Model: North – West corner rule, Least cost method, Vogel's Approximation method, Modi Method, Assignment problem, Dynamic Programming: Basic concepts, Bellman's optimality principle, Dynamic programming approach in decision making, Optimal subdivision problem.

UNIT- 3: Inventory Model: Introduction to the inventory problem, Deterministic models, The classical EOQ (Economic order quantity) model, Purchasing model with no shortage, Manufacturing model with no shortage, purchasing model with shortage, Manufacturing model with shortage, Inventory models with probabilistic demand.

UNIT –4: Sequencing and Queuing Theory: Sequencing problem, Johnson's algorithm for processing N-jobs through 2 machine problem, N-jobs through 3 machine problem, 2- job through N machine by graphical method, Characteristics of queuing system- steady state M/M/1, M/M/1K and M/M/C queuing models.

UNIT- 5: CPM and PERT: Arrow network, Time estimates – Earliest expected time, Latest allowable occurrence time and slack, Critical path, Probability of meeting scheduled date of completion of project, Calculation on CPM network, Various floats for activities, Critical Path, Updating project, Operation time cost trade off curve & project time cost trade off curve, selection of schedule based on cost analysis.

Course Outcome:

- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimization problems.
- Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

Name of Text Books:-

1. Operation Research, Panneerselvam, Prentice Hall of India
2. Operation Research: An Introduction - Hamdy a. Taha, Prentice Hall of India

Name of Reference Books:-

1. Gillett B.E, Introduction to Operation Research- A Computer Oriented algorithmic approach, Mc Graw Hill.
2. Kanti Swarup, Gupta.P.K.,Man Mohan, Operations Research, Sultan Chand & Sons.
3. Vohra N.D., Quantitative Techniques in Management, T.M.H.
4. Zoints. S.,Linear & Integer Programming,Prentice Hall.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: E-Commerce and Strategic IT

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322743(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- To understand the business impact and potential of e-commerce
- To learn about the technologies required to make e-Commerce viable
- To learn e-commerce from an enterprise point of view
- To learn about the working of various electronic payment systems

UNIT –Introduction:

What is E-Commerce, Forces behind E-Commerce, E-Commerce Industry Framework, and Brief History of E-commerce. Inter Organizational E-Commerce, Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

Unit–II -Network Infrastructure:

LAN, Ethernet (IEEE standard 802.3) LAN , WAN , Internet, TCP/IP Reference Model, Domain Name Server , Internet Industry Structure.

UNIT–III: Electronic payment systems:

Types of electronic payment systems, digital token-based electronic payment systems, smart cards & electronic payment systems, credit card based electronic payment systems, risk and electronic payment systems, designing electronic payment systems.

UNIT–IV: Information Distribution and Messaging:

FTP,E-Mail, www server, HTTP, Web service implementation, Information publishing , Web Browsers, HTML, Common Gateway Interface

UNIT –V: Mobile & wireless computing fundamentals:

Mobile computing framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile computing applications, personal communication service.

Course outcome: After successful completion of the course, students

- Will be able to apply the skills necessary for large-scale web based e-commerce project development.
- Will be able to work on information distribution and messaging services in e-commerce application.
- Will be able to work on business applications of wireless and mobile technologies for e-commerce.

Text books:

1. Frontiers of E-commerce by Kalakota & Whinston, Addison Wesley.
2. E-business road map for success by Dr. Ravi Kalakota& Marcia Robinson, Addison Wesley.

Reference book:

3. Electronic Commerce by Bharat Bhasker, TMH.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Natural Language Processing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322744(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course objective:

1. To understand the concepts of morphology, syntax, semantics and pragmatics of the language.
2. To recognize the significance of pragmatics for natural language understanding
3. To describe the simple system based on logic and demonstrate the difference between the semantic presentation and interpretation of that presentation
4. To describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing

Unit –I: Introduction and syntactic processing

The study of Language, Linguistic background, Grammars and Parsing, Features and Augmented Grammars, Grammars for Natural Language, towards efficient parsing, Ambiguity Resolution.

Unit –II: Semantic interpretation

Semantics and Logical Form, Linking Syntax and Semantics, Ambiguity Resolution, Strategies for Semantic Interpretation, Scoping and the Interpretation of Noun Phrases.

Unit –III: Pragmatics

Discourse: Reference Resolution, Syntactic and Semantic coherence, Text Coherence, An Inference based resolution algorithm. Dialogue and Conversational Agents: What makes dialogue different? Dialogue structure and coherence.

Unit –IV: Natural Language generation

Introduction to language generation, architecture for generation, surface realization, systemic grammar, functional unification grammar, discourse planning.

Unit –V: Machine translation

Language Similarities and Differences, transfer metaphor, syntactic transformations, lexical transfer, idea of Interlingua, direct translation, using Statistical Techniques

Course Outcomes: After successful completion of the course, students

1. Can set up, implement and evaluate natural language technology experiment step by step
2. Will be familiar with a sample of machine learning techniques and can assess which ones are suitable for a given problem
3. Can explain the interaction between rule based and probabilistic methods in language technology.

Text Books:

1. Speech and Language Processing, by Jurafsky, D. & Martin, J.H.
2. Natural Language Understanding, Allen, J

Reference Books:

1. Foundations of General Linguistics by Atkinson, M, Kilby, D A & Roca, I
2. An Introduction to Language by Fromkin, V & Rodman, R
3. Natural Language Processing for Prolog Programmers by Covington, M A
4. Natural language processing in Prolog: an introduction to computational linguistics by Gazdar, G& Mellish.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII
Subject: Object oriented DBMS (OODBMS)
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322745(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course objective:

1. This course discusses the requirements for advanced database features in database applications.
2. Introduce Parallel and Distributed databases.
3. Understand the enhanced data models for advanced applications
4. Examines the concepts of various emerging database technologies.

UNIT I: The extended Entity- Relationship Model and Object model:

The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

UNIT II: Object oriented databases:

Overview of Object-Oriented concepts, Object identity, Object structure, and type constructors, Encapsulation of operations, Methods, and Persistence, Type hierarchies and Inheritance, Type extents and queries, Complex objects; Database schema design for OODBMS; OQL, Persistent programming languages; OODBMS architecture and storage issues; Transactions and Concurrency control, Example of ODBMS.

UNIT III: Object relational and extended relational databases:

Database design for an ORDBMS - Nested relations and collections; Storage and access methods, Query processing and Optimization; An overview of SQL3, Implementation issues for extended type; Systems comparison of RDBMS, OODBMS, ORDBMS

UNIT IV: Parallel and distributed database and Client server architecture:

Architectures for parallel databases, Parallel query evaluation; Parallelizing individual operations, Sorting, Joins; Distributed database concepts, Data fragmentation, Replication, and allocation techniques for distributed database design; Query processing in distributed databases; Concurrency control and Recovery in distributed databases. An overview of Client-Server architecture.

UNIT V: Databases on the web and semi structured data:

Web interfaces to the Web, Overview of XML; Structure of XML data, Document schema, Querying XML data; Storage of XML data, XML applications; The semi structured data model, Implementation issues, Indexes for text data. **Enhanced Data Models for Advanced Applications:** Active database concepts. Temporal database concepts. Spatial databases, Concepts and architecture; Deductive databases and Query processing; Mobile databases, Geographic information systems.

Course outcome: After successful completion of the course, students will be

1. Able to understand the needs and concepts of object-oriented database, spatial database, web database, data warehousing and data mining.
2. Able to analyze, design and evaluate the construct of various advanced databases such as object-oriented, object-relational, semi-structured, unstructured and distributed databases.
3. Be able to implement practical solutions to GIS database problems using OO/OR database, spatial database, data warehousing and data mining approaches.

Text Books:

1. Object Oriented Interfaces and Databases, Rajesh Narang, Prentice Hall of India
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw-Hill

Reference books:

1. Fundamentals of Database Systems, Elmasri and Navathe, Pearson Education
2. Database System Concepts, Korth, Silberchatz, Sudarshan, McGraw-Hill.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Cloud computing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322746(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course objective:

1. Cloud computing represents a latest in the long history computing mainframe, Personal computing networked computing and expected to revolutionize the business is done.
2. This course covers the theoretical and practical aspects of cloud computing. At the end of the course, student will be able to appreciate the cloud computing paradigm, recognize its various forms and able to implement some cloud computing features.

UNIT I Introduction to Cloud Computing, The Emergence of Cloud Computing, Cloud-Based Service Offerings, Benefits of using a Cloud Model, Key Characteristics of Cloud Computing, Understanding- Public & Private cloud environments, The Evolution of Cloud Computing – Hardware & Internet Software Evolution.

UNIT II Cloud Security Challenges, Software-as-a-Service, Security Management People, Security Governance, Security Portfolio Management, Security Architecture Design, Identity Access Management (IAM), Data Security.

UNIT III Cloud as: Communication-as-a-Service (CAAS), Infrastructure-as-a-Service (IAAS), Monitoring-as-a-Service (MAAS), Platform-as-a-Service (PAAS), Software-as-a-Service (SAAS).

UNIT IV The MSP Model, Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, TheCloud Data Center, Basic Approach to a Data Center-Based SOA, Open Source Software, Service- Oriented Architectures as a Step Toward Cloud Computing.

UNIT V Virtualization concepts & Smartphone: virtualization benefits, Hardware virtualization, Software Virtualization, Memory Virtualization, Storage Virtualization, Data Virtualization, Network Virtualization, Virtualization Security Recommendations, Introduction to Various Virtualization OS VMware , KVM, Virtual Machine Security, Smartphone, Mobile Operating Systems for Smartphone's (iPhone, Windows Mobile), Google(Android) Blackberry, Ubuntu Mobile Internet.

Course Outcome:

1. Students will be able to perform cloud oriented analysis.
2. Students will be able to model cloud candidate derived from existing business documentation.
3. Students will be able to design the composition of a cloud services.
4. Students will be able to design application services for technology abstraction.

Text Books:

1. Toby Velte, Anthony Vote and Robert Elsenpeter, "Cloud Computing: A Practical Approach", McGraw Hill, 2002.

Reference Books:

1. George Reese, "Cloud Application Architectures: Building Applications and Infrastructures in the Cloud", O'Reilly Media, 2003.
2. Tim Matherm, SubraKumaraswamy and ShahedLatif, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance", O'Reilly Media, 2005.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Subject: Grid Computing

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322747(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course objective:

- To understand the need for and evolution of Grids in the context of processor- and data-intensive applications
- To be familiar with the fundamental components of Grid environments, such as authentication, authorization, resource access, and resource discovery

UNIT I: Concepts and Architecture:

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing Anatomy and Physiology of Grid- Web and Grid Services-Grid Standards - OGSAWSRF- Trends, Challenges and applications.

UNIT II: Grid Monitoring: GRID MONITORING

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- R-GMA –Grid ICE – MDS- Service Level Agreements (SLAs) - Other Monitoring Systems Ganglia, Grid Mon, Hawkeye and Network Weather Service.

UNIT III: Grid Security and Resource Management:

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management, Gridway and Gridbus Broker-principles of Local Schedulers- Overview of Condor, SGE, PBS, LSF- Grid Scheduling with QoS.

UNIT IV: Data Management and Grid Portals

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-Generations of Grid Portals.

UNIT V: Grid Middleware

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features. Features of Next generation grid.

Course Outcome: After successful completion of the course students will be

- be able to justify the applicability, or non-applicability of Grid technologies for a specific application
- be able to evaluate enabling technologies such as high-speed links and storage area networks for building computer grids;
- be able to design a grid computing application in one of the key application areas e.g. Computer Animation, E-Research;

Text Books:

1. Ian Foster, Carl Kesselman, The Grid 2: Blueprint for a New Computing Infrastructure, Elsevier Series, 2004.
2. Parvin Asadzadeh, Rajkumar Buyya, Chun Ling Kei, Deepa Nayar, and Srikumar Venugopal, High Performance Computing: Paradigm and Infrastructure, Wiley Press.

Reference Books:

1. Vladimir Silva, Grid Computing for Developers, Charles River Media, January 2006.
2. Jarek Nabrzyski, Jennifer M. Schopf, Jan Weglarz, Grid Resource Management: State of the Art and Future Trends , (International Series in Operations Research & Management Science), Springer; First edition, 2003
3. Fran Berman , Geoffrey Fox, Anthony J.G. Hey, Grid Computing: Making The Global Infrastructure a Reality,Wiley, 2003
4. Maozhen Li , Mark Baker , The Grid: Core Technologies, Wiley, 2005
5. Joshy Joseph , Craig Fellenstein Grid Computing, IBM Press, 2004 19
6. Borja Sotomayor , Lisa Childers, Globus Toolkit 4 : Programming Java Services , The Elsevier Series in Grid Computing, Morgan Kaufmann, 2005.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Scheme of teaching and examination B.E. VIII Semester Information Technology

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ES E	CT	TA		
1	Info. Technology	333831(33)	Enterprise Resource Planning (ERP)	4	1		80	20	20	120	5
2	Info. Technology	333832(33)	Mobile Computing and Application	3	1		80	20	20	120	4
3	Comp. Sc. & Engg	333833(22)	Cyber Security	3	1		80	20	20	120	4
4	Refer Table-3		Professional Elective-3	4			80	20	20	120	4
5	Refer Table-4		Open Elective – 4	4			80	20	20	120	4
6	Info. Technology	333861(33)	Simulation Lab			3	40		20	60	2
7	Comp. Sc. & Engg	333862(22)	Software Technology Lab			3	40		20	60	2
8	Info. Technology	333863(33)	Mobile Application Development Lab (J2ME)			3	40		20	60	2
9	Info. Technology	333864(33)	Major Project			7	100		80	180	4
10	Info. Technology	333865(33)	Report Writing & Seminar			2			40	40	1
11			Library			1					
			TOTAL	18	3	19	620	100	280	1000	32

L:Lecture T:Tutorial P:Practical ESE : End Semester Examination CT: Class Test
TA: Teacher's Assessment

Note : Duration of All theory papers will be of Three Hours

Professional Elective-3 Table -3

S.No.	Board of Study	Subject Code	Subject Name
1	Computer Science & Engg.	322840(22)	Neural Network & Fuzzy Logic
2	Computer Science & Engg.	322841(22)	Distributed Parallel Processing
3	Computer Science & Engg.	322842(22)	Distributed Multimedia
4	Computer Science & Engg.	322843(22)	Decision Support System
5	Computer Science & Engg.	322844(22)	Embeded systems
6	Computer Science & Engg.	322845(22)	Real Time Systems
7	Information Technology	333846(33)	Advance Information System

Note (1)- 1/4th of total strength of students subject to Minimum strength of twenty students is required to offer an elective in the college in a particular academic session.

Refer Table-4 : Open Elective – 4

S. No.	Board of Studies	Code	Name of Subject
1	Management	300851(76)	Enterprise Resource Planning
2	Information Technology	300852(33)	E-Commerce & strategic IT
3	Management	300853(76)	Technology Management
4	Information Technology	300854(33)	Decision Support & Executive Information system
5	Computer Science & Engg.	300855(22)	Software Technology
6	Management	300856(76)	Knowledge Entrepreneurship
7	Management	300857(76)	Finance Management
8	Management	300858(76)	Project Planning, Management & Evaluation
9	Mechanical Engg.	300859(37)	Safety Engineering
10	Computer Science & Engg.	300801(22)	Bio Informatics
11	Mechanical Engg.	300802(37)	Energy Conservation & Management
12	Nanotechnology	300803(47)	Nanotechnology
13	Management	300804(76)	Intellectual Property Rights
14	Mechanical Engg.	300805(37)	Value Engineering
15	Civil Engg.	300806(20)	Disaster Management
16	Civil Engg.	300807(20)	Construction Management
17	Civil Engg.	300808(20)	Ecology and Sustainable Development
18	Chem. Engg.	300809(19)	Non Conventional Energy Sources
19	Electrical Engg.	300810(24)	Energy Auditing and Management
20	Information Technology	300812(33)	Biometrics
21	Information Technology	300813(33)	Information Theory & Coding
22	Computer Science & Engg.	300814(22)	Supply Chain Management
23	Computer Science	300815(22)	Internet & Web Technology

Note:

- (1) 1/4th of total strength of students subject to minimum strength of twenty students is required to offer an elective in the college in a particular academic session.
- (2) Choice of elective course once made for an examination cannot be changed in future examinations.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Enterprise Resource Planning (ERP)

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 333831(33)

Total Tutorial Periods: 12

Minimum number of CT to be conducted: 02

Course Objectives:

- Understand the technical aspects of ERP systems;
- Learn concepts of reengineering and how they relate to ERP system;
- Understand the steps and activities in ERP implementation;
- Understand the typical functional modules in ERP system;
- Understand the technology areas of ERP and enterprise applications.

UNIT 1: ERP Overview, Implementation, Life Cycle, Return on Investment Analysis, Justification:

Definition, Need, Evolution, Benefits, Emerging Trends, Structure, Architecture(2-tier, 3-tier), Justifying Investment, Common Myths, Life Cycle, Methodology for Implementation, Cost of Implementation, In-house Implementation vs. External Consultants, ERP Consulting Companies.

UNIT 2: ERP Package Selection, Project Team and Organization Structure, Managing Requirements, BPR, Gap Identification and Strategies to Bridge the Gap: Selection-A Two Step Process, Roles and Responsibilities of Different Project Team Members, Core Team Selection, Consultant Selection, Requirement Gathering Process; BPR:

Pros and Cons, Redesign, Reengineering, Role of Information Technology, BPR and ERP, Benchmarking, Best Practices; Reasons for Gaps and Five Types of Gaps, Gap Document and Gap Management Strategy, Development Specifications-Functional and Technical, Gap Development Options.

UNIT 3: ERP Implementation and Support: Configuring and testing of the solution: Configuration, Testing;

Managing ERP Security: Types of Security Issues, System Access Security–Authorizations, Data Security and Technology for Managing Data Security; **Data Migration:** Migration of Data; **Cutover Planning and Go Live**

Preparation: Cutover, Go Live preparation; **Training:** Objective, Strategy, Environment and Technology, Train the Trainer Approach, Delivery, Content Development, Evaluation, Roles; **Success or Failure of ERP Implementation:** Reasons for Failure of an ERP Implementation, Reasons for Success of ERP Implementation.

UNIT 4 : ERP Functional Modules: Human Capital Management, Financial Management, Procurement and Inventory Management Through ERP, Production Planning and Execution, Supply Chain Planning, Sales and Service, Logistics Execution: Warehouse and Transport Management, Customer Relationship Management.

UNIT 5 : Technology Areas of ERP and Enterprise Applications, ERP for industries, Case studies:

Technology Areas of ERP and Enterprise Applications: Portal, Content Management and Knowledge Management, ERP and Enterprise Applications-Emerging Trends; **ERP for industries:** ERPs for Auto Industry, ERPs for Pharma, ERPs for Retail, ERPs for Educational Institutions, ERPs for Banks, ERPs for Insurance Companies; **Case studies:** mySAP Business Suite Implementation at ITC, Oracle ERP Implementation at Maruti Suzuki, Siebel CRM Implementation at Bharti Airtel.

Course Outcome: At the completion of the course a student will be able to –

- Describe the basic concepts and technologies used in ERP;
- Describe ERP package selection process;
- Describe the process of developing and implementing ERP systems;
- Identify and describe typical functional modules in ERP system;
- Explain the different applications of ERP systems.

Text Books:

1. Enterprise Resource Planning by Rajesh Ray, Tata McGraw Hill Education, 2011.
2. ERP Demystified, 2nd Edition by Alexis Leon, Tata McGraw Hill Education, 2008.

Reference Books:

1. ERP, Concepts & Practices by V.K. Garg & N.K. Venkatkrishnan, PHI, 2004.
2. Enterprise Resource Planning by Ashim Raj Singla, Cengage Learning, 2008.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Mobile Computing and Application

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Course Objective

- To introduce the fundamental design principles & issues in cellular & mobile communications.
- To enable the student to understand the basic features of cellular-mobile communication systems and digital radio system.
- To motivate students to understand the different technology for working of mobile devices, their advantages and disadvantages and emerging problems.

Unit- I Introduction, Cell Coverage &, Frequency Management: Mobile and wireless devices, Frequencies for radio transmission, A basic cellular system, Cell Size. Elements of cellular radio systems, Design and Interference, Concept of frequency reuse, cell splitting, Channels, Multiplexing, Access Techniques, Medium Access control, Spread spectrum, Specialized MAC, Cell Throughput., Co-channel interference reduction factor, Frequency management, fixed channel assignment, non-fixed channel assignment, traffic & channel assignment, Why hand off, types of handoff and their characteristics, dropped call rates & their evaluation.

Unit- II GSM Architecture & Services: GSM Services and Features, GSM System Architecture, GSM Radio Subsystem, GSM Channel Types, Example of a GSM Call, Signal Processing in GSM, Channel Coding for Data Channels, Channel Coding for Control Channels, Frequency and Channel Specifications. **New Data Services:** DECT Functional Concept, DECT Radio Link, Personal Access Communication Systems, PACS System Architecture, PACS Radio Interface, UMTS

UNIT-III: Wireless Networks: Wireless LAN, Hidden Nodes in Wireless Networks, Ordered MAC Techniques and Wireless Networks, Deterministic MACs for Wireless Networks, Comparison Of MAC Techniques for Wireless Networks; Infrared V/S Radio Transmission; IEEE 802.11, Architecture, Layers, Management; HIPERLAN; Bluetooth; Wireless Broadband (WiMAX), RFID, Java Card., WLL.

UNIT-IV: Mobile network and Transport layer: Mobile Network Layer; Mobile IP, DHCP, ADHOC Networks; Mobile Transport Layer; Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP; Fast Transmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transaction Oriented TCP.

UNIT-V: Mobile System Development and Support: Wireless Application Protocol (WAP) – WAP Model, WAP Gateway, WAP Protocols WAP User Agent Profile and Caching, Wireless Bearers for WAP, WAP Developer Toolkits, Mobile Station Application Execution Environment Third-Generation Mobile Services - Paradigm Shifts in Third-Generation Systems W-CDMA and cdma2000, Improvements on Core Network, Quality Service in 3G Wireless Operating System for 3G Handset, Third- Generation Systems and Field Trials, Other Trial Systems, Impact on Manufacture and Operator Technologies.

Course Outcome: After successful completion of the course students will be able to

- Understand the basic physical-layer architecture of a mobile communication system.
 - Understand various multiple-access techniques for mobile communications, and their advantages and disadvantages.
1. Students will be able to acknowledge about the working and development of mobile and wireless devices in detail, services provided by them and recent application development trends in this field.

Text Books

1. Mobile Communications – Schiller, Jochen; 2nd Indian Reprint, Pearson Education Asia – Addison Wesley Longman PTE. Ltd.
2. Wireless Communication Principles and Practice, Theodore S Rappaport, 2nd Ed, Pearson Education.

Reference Books:

1. Mobile Data Wireless LAN Technologies – Dayem, Rifaat A.; Prentice Hall International.
2. The Essential Guide to Wireless Communication Applications – Dornan, A.; 1st Indian Reprint, Pearson Education Asia.
3. Sandeep Singhal, “The Wireless Application Protocol”, Pearson Education Asia,
4. P. Stavronlakis, “Third Generation Mobile Telecommunication systems”, Springer Publishers.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Cyber Security

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.

Code: 333833(22)

Total Tutorial Periods: 12

Minimum number of CT to be conducted: 02

Course objective:

- To Create cyber security awareness and to understand principles of web security
- To understand key terms and concepts in cyber law, intellectual property and cyber crimes, trademarks and domain theft.
- To make attentive to students about possible hacking and threats in this communication era.
- Discuss Issues for creating Security Policy for a Large Organization.

Unit – 1: Cyber Security Fundamentals

Security Concepts: Authentication, Authorization, Non-repudiation, Confidentiality, Integrity, availability. Cyber Crimes and Criminals: Definition of cyber-crime, types of cyber-crimes and types of cyber-criminals.

Unit – 2: Cyber attacker Techniques and Motivations

Anti-forensics: Use of proxies, use of tunneling techniques. Fraud techniques: Phishing and malicious mobile code, Rogue antivirus, Click fraud. Threat Infrastructure: Botnets, Fast Flux and advanced fast flux.

Unit – 3: Exploitation

Techniques to gain foothold: Shellcode, Buffer overflows, SQL Injection, Race Conditions, DoS Conditions, Brute force and dictionary attacks. Misdirection, Reconnaissance, and Disruption

Methods: Cross-Site Scripting (XSS), Social Engineering, WarXing, DNS Amplification Attacks.

Unit – 4: Information Technology Act 2000

Overview of IT Act 2000, Amendments and Limitations of IT Act, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offenses, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

Unit – 5: Cyber Law and Related Legislation

Patent Law, Trademark Law, Copyright, Software Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution, Online Dispute Resolution (ODR).

Course Outcome –

- Students will be able to acknowledge about the cybercrime, cyber criminal, and intellectual property rights.
- Encouraging Open Standards.
- Protection and resilience of Critical Information Infrastructure.
- To enable effective prevention, investigation and prosecution of cybercrime and enhancement of law enforcement capabilities through appropriate legislative intervention.

Text Books

1. Cyber Security Essentials, James Graham et al. CRC Press
2. Cyber Laws: Intellectual property & E Commerce Security, Kumar K. Dominant Publisher

Reference Books

1. Cyber Law Text & Cases, Gerald R. Ferrera, Margo E. K. Reder, CENGAGE LEARNING Publication.
2. Ethics in Information Technology, George W. Reynolds, CENGAGE LEARNING Publication.
3. Cyber Laws & IT Protection, Harish Chander, PHI Publication.
4. Ross J. Anderson. *Security Engineering: A Guide to Building Dependable Distributed Systems*. John Wiley, New York, NY, 2001.
5. Matt Bishop. *Computer Security: Art and Science*. Addison Wesley, Boston, MA, 2003.
6. Frank Stajano. *Security for Ubiquitous Computing*. John Wiley, 2002.
7. Online Textbook Materials www.securityplusolc.com

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C. G.)

Semester: **VIII**

Subject: **Simulation Lab**

Total Practical Periods: **42**

Total Marks in End Semester Exam: **40**

Branch: **Information Technology.**

Code: 333861(33)

Duration of period: 50 minutes

Number of Periods per Week: 3

Course Objective:

- To analyze the performance of wireless and wired networks.
- To motivate our students to learn the different factors which influence the performance of different networks, algorithms and protocols so that just by caring those factors performance can be greatly enhanced.
- To develop better understanding of new simulation technologies by which one can analyze all situations before actual implementation.

List of Experiments:

1. Introduce students to network simulation through the NetSim or Qualnet simulation package, Create a simple network model with multiple scenarios, collect statistics on network performance through the use of NetSim tools, analyze statistics and draw conclusions on network performance.
2. To understand IP forwarding within a LAN and across a router.
3. Study the working of the spanning tree algorithm by varying the priority among the switches.
4. To understand the working of “**Connection Establishment**” in TCP using NetSim or Qualnet.
5. During client-server TCP downloads study the throughputs of Slow start + Congestion avoidance (also known as Old Tahoe) and Fast Retransmit (also known as Tahoe), Congestion Control Algorithms.
6. To study how the Bit Error Rate (loss) and data of a Wireless LAN (IEEE 802.11b) network varies as the distance between the Access Point and the wireless nodes is varied.
7. Study the working and routing table formation of Interior Routing Protocols, i.e. Routing Information protocol (RIP) and Open Shortest Path First (OSPF).
8. Study the throughput characteristics of a slotted aloha network.
9. Understand the impact of bit error rate on packet error and investigate the impact of error of a simple hub based CSMA / CD network.
10. Study how call blocking probability varies as the load on a GSM network is continuously increased.
11. Study how the number of channels increases and the Call blocking probability decreases as the Voice activity factor of a CDMA network is decreased.
12. Verification of Stop and Wait protocol.
13. Verification of Go Back N protocol.
14. Verification of Selective Repeat Protocol.

Course outcome: After successful completion the course students will be able to

- Understand the internal working of wired and wireless network.
- Acknowledge about the quality of different networks, protocols and algorithms.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C. G.)

Semester: **VIII**

Subject: **Software Technology Lab**

Total Practical Periods: **42**

Total Marks in End Semester Exam: **40**

Branch: **Information Technology.**

Code: 333862(22)

Duration of period: 50 minutes

Number of Periods per Week: 3

Course Objectives:

- The objective of this lab is to develop an ability to design and implement static and dynamic website
- To learn how to create a simple & advanced web page using html along with the usage of style sheets, lists, creation or tables with borders, padding and colors.
- To get acquainted with JavaScript procedures and usage of regular expressions in JavaScript.

Expt-1: Develop and demonstrate a XHTML document that illustrates the use external style sheet, ordered list, table, borders, padding, color, and the tag.

Expt-2: Develop and demonstrate a XHTML file that includes Java script for the following problems:

- a) Input : A number n obtained using prompt
Output : The first n Fibonacci numbers
- b) Input : A number n obtained using prompt
Output : A table of numbers from 1 to n and their squares using alert

Expt-3: Develop and demonstrate a XHTML file that includes JavaScript script that uses functions for the following problems:

- a) Parameter: A string
Output: The position in the string of the left-most vowel
- b) Parameter: A number
Output: The number with its digits in the reverse order

Guideline:

1. Declare the script tag as text/javascript in the beginning of the <body> of html program
2. Get the number to be reversed from the user using prompt()
3. Validate input number (should be a positive number between 0 to 9) using the regular expression “/^[0-9]+\$/ “ and alert the user for invalid input using alert()
4. Reverse the number using modulus operation.
5. Use math.floor(number/10) to get the floor of number after division (used for reversing)
6. Display the reversed string using alert()

Expt-4(a): Develop and demonstrate, using Java script, a XHTML document that collects the USN (the valid format is: A digit from 1 to 4 followed by two upper-case characters followed by two digits followed by two upper-case characters followed by three digits; no embedded spaces allowed) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected.

(b): Modify the above program to get the current semester also (restricted to be a number from 1 to 8)

Expt-5: Develop and demonstrate, using JavaScript script, a XHTML document that contains three short paragraphs of text, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible.

Expt-6: Design an XML document to store information about a student in an engineering college affiliated to CSVTU.

- The information must include Enrolment, Univ_Roll, Name, Name of the College, Brach, Year of Joining, and e-mail id.
- Create sample data for 10 students. Create a CSS style sheet and use it to display the document.

Expt-7: (a) Write a Perl program to display various Server Information like Server Name, ServerSoftware, Server protocol, CGI Revision etc.

(b) Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.

Expt-8: Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.

Expt-9: Write a Perl program to display a digital clock which displays the current time of the server

Expt-10: Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.

EXPT-11: Write a PHP/.Net program to store current date-time in a COOKIE and display the “Last visited on date-time on the web page upon reopening of the same page.

EXPT-12: Write a PHP/.Net program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

EXPT-13: Create a XHTML form with Name, Address Line 1, Address Line 2, and E-mail text fields. On submitting, store the values in MySQL table. Retrieve and display the data based on Name.

EXPT-14: Using PHP/.Net develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

EXPT-15: Using PHP/.Net Technology develop an online portal of an online Book store. The pages should resemble www.amazon.com the website should consist the following pages.

- Home page
- Registration and user Login
- User Profile Page
- Books catalog
- Shopping Cart
- Payment By credit card
- Order Conformation

Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

Course outcome:

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

- Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
- Have a Good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C. G.)

Semester: **VIII**
Subject: **Mobile Application Development Lab**
Total Practical Periods: **42**
Total Marks in End Semester Exam: **40**

Branch: **Information Technology.**
Code: **333863(33)**
Duration of period: 50 minutes
Number of Periods per Week: 3

Course Objective:

- To learn how a mobile application works.
- To create GUI application using J2ME.
- To use different components and events in mobile applications.
- To use sms or connectivity services with mobile applications.

Course outcome: Students who complete this course should be able to do the following things.

- Use of java in mobile applications.
 - Design and develop different mobile applications using J2ME.
 - Development of Mobile applications using J2ME, like SMS, Gaming and Multimedia.
1. a) Write a J2ME program to show how to change the font size and color.
b) Write a J2ME program which creates the following kind of menu.
 - cut
 - copy
 - past
 - delete
 - select all
 - unselect all
 2. Event Handling- Create a J2ME menu which has the following options:
 - cut - can be on/off
 - copy - can be on/off
 - paste - can be on/off
 - delete - can be on/off
 - select all - put all 4 options on
 - unselect all - put all
 3. Graphical User Interface - Create MIDP GUI application to demonstrate Graphical User Interfaces with MIDP
 - organizing UI by Screens
 - Forms and Items
 - Layout Control
 - TextField class
 - DateField class
 - ChoiceGroup class
 - other item classes
 - Alerts
 - Tickers
 4. Graphical User Interface - Create MIDP GUI application to demonstrate Animations and drawing
 - Canvas class
 - 2D Graphics

- Fonts
- Drawing Text
- Repainting

5. Event Handling - Create MIDP GUI application to demonstrate

- Event Architecture
- Commands
- Item state changes
- Keyboard input
- Pointer input

6. Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.

7. Create an MIDP application which examines, that a phone number, which a user has entered is in the given format (Input checking):

- * Area code should be one of the following: 040, 041, 050, 0400, 044
- * There should 6-8 numbers in telephone number (+ area code)

8. Write a program to show how to make a SOCKET Connection from J2ME phone. Many a times there is a need to connect backend HTTP server from the J2ME application. Show how to make a SOCKET connection from the phone to port 80.

9. Login to HTTP Server from a J2ME Program. Write program to shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server. Many J2ME applications for security reasons require the authentication of the user.

Note: Use Apache Tomcat Server as Web Server and MySQL as Database Server.

10. Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.

11-15. Developing network applications using wireless toolkit- create a simple client-server UDP based application. The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)

- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C. G.)

Semester: **VIII**

Subject: **Major Project**

Total Practical Periods: 7 per week

Total Marks in End Semester Exam: **100**

Branch: **Information Technology.**

Code: **333864(33)**

Duration of period: 50 minutes

Number of Periods per Week: 7

Guideline for Allocation of project:

1. Information regarding broad area must be made available to the students well in advance (may be during previous semester).
2. Information must cover following parameters.
 - I. **Broad area:** Subject or expertise/application area.
 - II. **Required skills:** Knowledge of subject(s), software, tools & other characteristics.
 - III. **Type of project:** Hardware, software, design, survey, study based etc.
 - IV. **Guide available:** Name of Guide (S) from Department & Institute.
 - V. **Other related information** depending upon specific branch & institute.
3. It is also recommended to give proper counseling to pick up suitable project.
4. Students must get chance to select projects as per their choice or decided mutually between students and department faculty (HoD) concern.
5. One project group must contain maximum four students, however students can do project individually but it should be approved by department.
6. Compiled list of projects must be submitted to the University within 25 days of start of semester.
7. Compiled list may contain following parameters.

Monitoring of project:

1. It is recommended to give projects as per the specializations of existing faculty of the department instead of outside person/agency.
2. Project must be allocated, developed and monitored by department / institution itself, but not by outside agencies.
3. Regular review by guide is recommended to ensure development & contribution of students.

Internal Evaluation & Submission of project:

1. Evaluation of project would be as per the examination scheme of the University, which is based on internal as well as external evaluation.
2. Internal assessment requires submission of project report for getting approved by the concern authority. However printing and binding would be as per the conventional format.
3. Evaluation will be based on live demonstration / presentation and Viva.
4. Final submission of project is expected as,
 - Submission of a copy to the University,
 - One copy to the Institution central library,
 - One copy to the department.

External Evaluation:

External assessment of project would be like conduction of practical exams of University, and must be executed as per the norms of practical exams.

NOTE: Completion of Project outside the department/Institution should not be encouraged.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: **VIII**

Subject: Software Testing

Total Marks in End Semester Exam: **80.**

Minimum number of class tests to be conducted: **02.**

Branch: **Information Technology**

Code: 322849(22)

Total Tutorial Periods: **Nil.**

Total Theory Periods: **50**

COURSE OBJECTIVE:

- To study software testing objectives, process, criteria, strategies, and methods.
- To study various software testing issues and solutions in software unit, integration, regression, and system testing.
- To study planning of a test project, design test cases, conduction of testing operations, generation of a test report.
- To understand automation testing processes its problems and solutions.

Unit-I: Quality Revolution, Software Quality, Role of Testing, Objectives of Testing, Concept of Complete Testing, Central Issue of Testing, Sources of Information for Test Case selection, Test Planning and Design, Monitoring and Measuring Test Execution, Test Tools and Automation, Test Team Organization and Management.

Unit-II: Basic Concepts of Testing Theory, Theory of Goodenough and Gerhart, Theory of Weyuker and Ostrand, Theory of Gourlay, Adequacy of Testing, Limitations of Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Debugging.

Unit-III: Outline of Control Flow Testing, Control Flow Graph, Paths in Control Flow Graphs, Path Selection Criteria, Data Flow Testing criteria, Comparison of Data Flow and Test Selection Criteria, Domain Error, Testing of Domain Errors.

Unit-IV: System Test design, Test design Factors, Requirement Identification, Test Objective Identification, Structure of a System Test Plan, Assumptions, Test Approach, Test Suite Structure, Types Of Acceptance Testing

Unit-V: Five Views of Software Quality, Quality Control, Quality assurance, Cost of quality, Software Quality Assurance, SQA Plan, ISO 9000, Capability Maturity Model, McCall's Quality Factors.

COURSE OUTCOME: After successful completion of the course, students

- Will be able to design and conduct a software test process for a software testing project.
- Will be able to identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- Will be able to use software testing methods and modern software testing tools for their testing projects.

Text Books:

1. Kshirasagar Naik, "Software Testing and Quality Assurance", John Wiley & Sons.
2. William Perry, "Effective Methods for Software Testing", John Wiley & Sons.

Reference Books

1. Cem Kaner and Jack Falk, "Testing Computer Software", Wiley.
2. Ron Patton, "Software Testing", SAMS Publications

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester – VIII

Subject: Advance Information Systems

Total Theory Periods: 50

Class Test (Minimum): 02

Branch: Information Technology

Code: 333846(33)

Total Tutorial Periods: NIL

Assignments (Minimum): 02

Course Objective: The main Objective to include this subject in Information Technology discipline is:

- To explore brief idea about the basic working of advance communications systems, new trends and technology and different services provided in this field.
- To motivate our students to understand the different technology for working of these devices, their advantages and disadvantages and emerging problems regarding these.
- To develop a view regarding their applications, software development and emerging trends.
- To give the student an understanding of present day communication technologies like DTH, SONET, OTDR, GPS, NAVIGATION, TRACKING RADAR Systems.

UNIT-I: Optical Receiver and Transmission Systems Operation: Receiver operation, Preamplifier types, receiver performance and sensitivity, Eye diagrams, Coherent detection, Specification of receivers.

Transmission Systems :Point –to–point link –system considerations, Link power budget and rise time budget methods for design of optical link, BER calculation Semiconductor optical Amplifier, EDFA, Raman Amplifier, Wideband Optical Amplifiers.

UNIT-II: Advances in Optical Fiber Systems: Principles of WDM, DWDM, Telecommunications & broadband application, SONET/SDH, MUX, Analog & Digital broadband, optical switching Optical couplers, Tunable sources and Filters ,optical MUX/DEMUX, Arrayed waveguide grating, optical add drop multiplexer (OADM), optical circulators, attenuators, optical cross connects, wavelength converter, Mach-Zender Interferometer, **Fiber Optical Measurements :** Test Equipments, OTDR , Set ups for Measurement of Attenuation, Dispersion, NA and EYE pattern .

UNIT-III: Applications of satellite communication: INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Direct Broadcast satellites (DBS)- Direct to home Broadcast (DTH), Digital audio broadcast (DAB)- World space services, Business TV(BTV), GRAMSAT, Specialized services – E –mail, Video conferencing, Internet.

UNIT-IV: satellite Navigation and the Global Positioning System: Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and codes, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, Differential GPS.

UNIT-V: Radar and its Application: Radar: Basic principles, Radar equation, factors influencing maximum range, effect of noise, power and frequencies used in Radar, types of Radar, Basic pulsed Radar system, Modulators, receivers, Bandwidth requirements, factors governing pulse characteristics, Duplexer, moving target indicator (MTI), tracking Radar systems and search systems.

Course Outcome:

- Students will be able to acknowledge about the working and development of advance communication systems in detail, services provided by them and recent application development trends in this field.
- They may go to choose their carrier in application development for these systems.
- Students will have detailed understanding current and proposed modern communication technologies.
- The student will have the ability to work in advanced research in wireless and optical technologies.

Text Books:

1. 'Fiber optic Communication', Joseph C. Palais, Prentice Hall.
2. 'Satellite Communication', Dr. D. C. Agrawal, Khanna Publishers.
3. Principle of Radar communication, Grolsky.

Reference Books:

1. Satellite Communication System Engg. W.L. Pritchard & J. A. Sciulli:Prentice Hall.
2. Optoelectronics and Fiber Communication Sarkar and Sarkar New age international publication.
3. Satellite Communication, Robert M Gagliardi
4. Satellite Communications, Timothy Pratt, Charles W. Bostian

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Neural Network and Fuzzy Logic.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322840(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- To provide the student with the basic understanding of neural networks and fuzzy logic fundamentals, Program the related algorithms and Design the required and related systems.
- To cater the knowledge of Neural Networks and Fuzzy Logic Control and use these for controlling real time systems.

UNIT-I Introduction to Artificial Neural Networks:

Elementary Neurophysiology, Models of a Neuron, Neural Networks viewed as directed graphs, Feedback, from neurons to ANN, Artificial Intelligence and Neural Networks; Network Architectures, Single-layered Feed forward Networks, Multi-layered Feed forward Networks, Recurrent Networks, Topologies.

UNIT-II Learning and Training:

Activation and Synaptic Dynamics, Hebbian, Memory based, Competitive, Error-Correction Learning, Credit Assignment Problem: Supervised and Unsupervised learning, Memory models, Stability and Convergence, Recall and Adaptation.

UNIT-III A Survey of Neural Network Models:

Single-layered Perceptron – least mean square algorithm, Multi-layered Perceptrons – Back propagation Algorithm, XOR – Problem, The generalized Delta rule, BPN Applications, Adalines and Madalines – Algorithm and applications.

UNIT-IV Applications:

Talking Network and Phonetic typewriter: Speech Generation and Speech recognition, Neocognitron – Character Recognition and Handwritten Digit recognition, Pattern Recognition Applications.

UNIT-V Neural Fuzzy Systems:

Introduction to Fuzzy sets, operations, relations, Examples of Fuzzy logic, Defuzzification, Fuzzy Associative memories, Fuzziness in neural networks and examples.

Course outcome:

- To provide adequate knowledge about concepts of feed forward neural networks and feedback neural networks.
- To teach about the concept of fuzziness involved in various systems.
- To provide adequate knowledge about fuzzy set theory.
- To provide comprehensive knowledge of fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
- To provide adequate knowledge of application of fuzzy logic control to real time systems.

Text Books:

1. Artificial Neural Networks by B. Yagna Narayan, PHI
2. Neural Networks Fuzzy Logic & Genetic Algorithms by Rajshekar & Pai, Prentice Hall

Reference Books:

1. Neural Networks by James A. Freeman and David M. Strapetuns, Prentice Hall,.
3. Neural Network & Fuzzy System by Bart Kosko, PHI.
4. Neural Network Design by Hagan Demuth Deale Vikas Publication House

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Distributed Parallel Processing.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322841(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective:

- To develop structural intuition of how the hardware and the software work, starting from simple systems to complex shared resource architectures.
- Get a broad understanding of parallel computer architecture and different models for parallel computing.
- To learn about strategies for how algorithms that were originally developed for single-processor systems can be converted to run efficiently on parallel computers.
- To know about current practical implementations of parallel architectures.
- To learn how to design parallel programs and how to evaluate their execution
- To understand the characteristics, the benefits and the limitations of parallel systems and distributed infrastructures

UNIT – I: Parallel processing – Definition, Architectures; Programmability- Operating Systems Support, Types of Os, Parallel Programming Models, Software Tools; Data Dependency Analysis; Shared Memory Programming; Thread based Implementation- Management, Example, Attributes Mutual exclusion, Events & condition Variables, Deviation computation

UNIT-II: Distributed Computing -I- message passing, general model, programming model, PVM-Process Control, Information, Message Buffers, Signaling, Sending, receiving, Group Operations, Starting PVM, Compiling PVM Application, PVM Console Commands.

UNIT-III: Distributed Computing-II- remote procedure call, parameter passing, Locating the server, semantics, security, problem areas, Java Remote method invocation, DCE, Deploying application in DCE, POSIX Thread reference-Creation, Attributes, Termination, Mutual Exclusion primitives, Condition Variables, Cancellations, Specific data Functions.

UNIT-IV: Algorithms for parallel machines- Computations, Histogram Computation, Parallel Reduction, Quadrature problem, Matrix Multiplication, Parallel Sorting Algorithms, solving linear systems, probabilistic algorithms.

UNIT-V: Parallel programming languages- Sample Problem; Fortran 90; n-CUBE C; Occam; C-Linda. Debugging parallel programming- techniques, message passing, shared memory; Data Flow Computing, Systolic Architecture, functional and logical paradigms, distributed shared memory. Distributed Data Bases- Objectives, Issues, System, Distribution Options Data Base Integrity, Concurrency Control, DDBMS Structure. Distributed Operating Systems-Need, Network Operating Systems, DOS Goals, Design Issues, Amoeba.

Course outcome: On completion of this subject the student is expected to:

- Have an understanding of parallel algorithms, analysis and architectures.
- Obtain experience developing parallel algorithms for various parallel architectures.
- Be able to reason about ways to parallelize a problem and evaluate a parallel platform for a given problem
- Become familiar with programming with MPI and Map Reduce/Hadoop

TEXT BOOKS

1. Introduction to Parallel Processing by M. Sasikumar et al- Prentice Hall of India.
2. Parallel Distributed Processing by David E Ramulhat , MIT press

REFERENCE BOOKS

1. Parallel Processing by Rajaraman V - Prentice Hall of India.
2. An Introduction to Distributed and Parallel Processing by John A. Sharp; Alfred Waller Ltd
3. Parallel and Distributed Processing by Rolim, Jose; Springer

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Distributed Multimedia.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322842(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

- To understand the systems aspects of creating and deploying interactive multimedia applications.
- To study the data coding, streaming multimedia servers, temporal specification languages and rendering systems required to store and deploy multimedia information in distributed, networked environments.

Unit-I: Components of Distributed system: Application software, Document store, Image and still video store, Audio and full motion video store, Object directory service agent, Components service agent, User interface service agent. **Distributed Client- Server Operation:** Clients in distributed work group computing, Database operations, Middleware in distributed work group computing.

Unit-II: Multimedia object server: Types of multimedia server, mass storage for multimedia servers, write once read many optical disks, rewritable optical disks, Optical disk libraries, network topologies for multimedia object servers. **Multi server Network topologies:** traditional LANs, Extended LANs, High Speed LANs, WANs, Network performance issues.

Unit-III: Distributed Multimedia database: Database organization for multimedia applications, transaction management for multimedia system, managing hypermedia records as objects.

Managing distributed object: Inter server communication, object server architecture, object identification, object revision management, optimizing network location of object, object directory services, multimedia object retrieval, database replication techniques, Object migrations schemes, Optimizing object storage.

Unit-IV: System Design Methodology and Considerations

Fundamental Design issue, key deliverables, data mining enterprise requirements, technology assessments, Business information model, Examining current architecture and feasibility, Performance analysis: Performance analysis and monitoring, Impact of performance issues on design.

Unit-V: Designing for performance: Storage management, Access management and optimization of storage distribution, Maximizing network transportation, managing system performance. **Multimedia system design:** System design methodology, designing system object, object oriented multimedia system, designing objects, system design analysis, system extensibility.

Course outcome: End of the course students

- Be familiar with multimedia data types and the conversion between analogue and digital forms.
- Have gained experience in the use of multimedia systems and the ability to manipulate multimedia data programmatically.
- Have gained an understanding of the issues that arise when multimedia communication is attempted across the Internet.
- Understand the issues that arise when designing and building multimedia systems.

Text Books

1. Multimedia system design Prabhat K.Andleigh, Kiran Thakrar
2. Multimedia: Computing, Communication and Application by Ralf Steinmetz and Klara Nahrstedt.

Reference Books

1. Data and Computer Communication by William Stallings

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Decision Support System
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Information Technology.
Code: 322843(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective:

- To review and clarify the fundamental terms, concepts and theories associated with Decision Support Systems, computerized decision aids, expert systems, group support systems and executive information systems.
- To examine examples and case studies documenting computer support for organizational decision making, and various planning, analysis and control tasks.
- To discuss and develop skills in the analysis, design and implementation of computerized Decision Support Systems.
- To understand that most Decision Support Systems are designed to support rather than replace decision makers and the consequences of this perspective for designing DSS.
- To discuss organizational and social implications of Decision Support Systems.

Unit-I: Overview of different types of decision-making: Strategic, tactical and operational. Consideration of organizational structures. Mapping of databases, MIS, EIS, KBS, expert systems OR modeling systems and simulation, decision analytic systems onto activities within an organization. Extension to other 'non organizational' areas of decision making. Relationship with knowledge management systems

Unit-II: Studies of human cognition in relation to decision making and the assimilation of information. Cultural issues. Implications for design of decision-making support. Communication issues.

Unit –III: Normative, descriptive and prescriptive analysis: requisite modeling. Contrast with recognition primed decision tools.

Unit –IV: Database, MIS, EIS, KBS, Belief nets, data mining. OR modeling tools: simulation and optimization. History, design, implementation: benefits and pitfalls. Risk assessment. Decision analysis and strategic decision support.

Unit –V: Group decision support systems and decision conferencing. Intelligent decision support systems: tools and applications. Cutting-edge decision support technologies. History, design, implementation: benefits and pitfalls. Deliberative e-democracy and e-participation

Course outcome: At the end of the course students will

- Recognize the relationship between business information needs and decision making
- Appraise the general nature and range of decision support systems
- Appraise issues related to the Analyse, design, development and implement a DSS
- Select appropriate modeling techniques

Text Books

1. P.R. Kleindorfer, H.C. Kunreuther, P.J.H. Schoemaker , “Decision Sciences: an integration Perspective”, Cambridge University Press 1993
2. G.M. Marakas, Decision support Systems in the 21st Century, Prentice Hall.

Reference Books

1. E. Turban and J.E. Aronson, Decision support Systems and Intelligent Systems. Prentice Hall
2. V.S.Janakiraman and K.Sarukesi, Decision Support Systems, PHI
3. Efrem G. Mallach, Decision Support and Data Warehouse Systems, tata McGraw-Hill.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Branch: Information Technology.

Subject: Real Time Systems

Code: 322845(22)

Total Theory Periods: 50

Total Tutorial Periods: NIL

Total Marks in End Semester Exam: 80

Minimum number of CT to be conducted: 02

Course Objective:

- To study real-time computer control systems and their implementation techniques.
- Provide examples of real-time systems including functionality and implementation platforms.
- Describe and exemplify design parameters for real-time systems including execution time, implementation, communication & user interface.
- Study a range of methodologies for specifying and designing real time systems.
- Understand hardware and software design and implementation of real-time systems
- Describe and apply systems engineering methods and techniques in the design and analysis of real-time systems.

Unit-I: Basic Real- Time Concepts, Computer Hardware, Language Issues:

Basic component Architecture, terminology, Real Time Design Issues, CPU, Memories, Input- Output, Other Devices Language Features, Survey of Commonly Used Programming Languages, Code Generation

Unit-II: Software life cycle, Real Time Specification and Design Techniques, Real Time Kernels: Phases of software life cycle, Non-temporal Transition in the software life cycle, Spiral model, Natural languages, Mathematical Specification, Flow Charts, Structure Charts, Pseudocode and programmable Design Languages, Finite state Automata, Data Flow Diagrams, Petrinets, Statecharts, Polled Loop Systems, phase/State Driven Code, Coroutines, Interrupt Driven System, Foreground/Background Systems Full Featured Real Time OS

Unit-III: Intertask Communication and Synchronization, Real Time memory Management, System Performance Analysis and Optimization: Buffering Data, Mail boxes Critical Region, Semaphores, Event Flags and Signals, Deadlock, Process Stack Management, Dynamic Allocation, Static Schemes, Response Time Calculation, Interrupt Latency, Time Loading and its Measurement, Scheduling NP Complete, Relocating Response Times And time Loading, Analysis of Memory Requirements, Reducing Memory Loading, I/O Performance.

Unit-IV: Queuing Models, Reliability, Testing, And Fault Tolerance, Multiprocessing Systems:

Basic Buffer size Calculation, Classical Queuing Theory, Little's Law, Faults, Failures ,bugs AND effects. Reliability, Testing, Fault Tolerance, Classification of Architectures, Distributed Systems, Non Von Neumann Architectures.

Unit-V: Hardware/ Software Integration, Real Time Applications:

Goals of Real Time System Integration, Tools, Methodology, The Software Heisenberg Uncertainty Principle, Real Time Systems As Complex System, First Real Time Application Real Time Databases, Real time Image Processing Real Time UNIX, building Real Time Applications with Real Time Programming Languages.

Course outcome:

- Clearly differentiate the different issues that arise in designing soft and hard real-time, concurrent, reactive, safety-critical and embedded systems.
- Explain the various concepts of time that arise in real-time systems.
- Describe the design and implementation of systems that support real-time applications. Justify and critique facilities provided by real-time operating systems and networks.
- Design, construct and analyze a small, concurrent, reactive, real-time system.
- Select and use appropriate engineering techniques, and explain the effect of your design decisions on the behavior of the system.

Text Books :

1. Real Time System, Jane W.S.Liu
2. Real Time Systems Design and Analysis by Phillip A. Laplante,PHI

Reference Books:

- 1 Hard Real Time Computing Systems Predictable Scheduling Algorithms and applications by Giorgio C. Buttazzo
- 2 Real Time Design Patterns: Robust Scalable Architecture for Real Time System by BrucePowel Douglass
3. Real Time System: Scheduling, Analysis and Verification by Albert M.K. Change

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Embedded Systems

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Information Technology.

Code: 322844(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective:

1. To introduce students to the modern embedded systems and to show how to understand and program such systems using a concrete platform built around A modern embedded processor like the Intel ATOM.

UNIT I EMBEDDED COMPUTING

Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT II EMBEDDED C PROGRAMMING

C-looping structures – Register allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues.

UNIT III OPTIMIZING ASSEMBLY CODE

Profiling and cycle counting – instruction scheduling – Register allocation – conditional execution – looping constructs – bit manipulation – efficient switches – optimized primitives.

UNIT IV PROCESSES AND OPERATING SYSTEMS

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling - Performance issues.

UNIT V EMBEDDED SYSTEM DEVELOPMENT

Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Complete design of example embedded systems.

Course outcome:

- Describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems..
- Become aware of the architecture of the ATOM processor and its programming aspects (assembly Level)
- Become aware of interrupts, hyper threading and software optimization.
- Design real time embedded systems using the concepts of RTOS.
- Analyze various examples of embedded systems based on ATOM processor

Text books and Reference books:

1. Andrew N Sloss, D. Symes, C. Wright, “ARM System Developers Guide”, Morgan Kaufmann / Elsevier, 2006.
2. Michael J. Pont, “Embedded C”, Pearson Education , 2007.
3. Wayne Wolf, “Computers as Components: Principles of Embedded Computer System Design”, Morgan Kaufmann / Elsevier, 2nd. edition, 2008.
4. Steve Heath, “Embedded System Design” , Elsevier, 2nd. edition, 2003.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Internet and Web Technology

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.

Code: 300815(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

- Describe the important features of the Web and Web browser software
- Evaluate e-mail software and Web-based e-mail services
- Use FTP and other services to transfer and store data
- Demonstrate the use of real-time chat and briefly describe the history of the wireless Internet
- Create HTML documents and enhance them with browser extensions

UNIT-I INTRODUCTION TO INTERNET

Introduction, Evolution of Internet, Internet Applications, Internet Protocol -TCP/IP, UDP, HTTP, Secure Http(Shttp) Internet Addressing – Addressing Scheme – Ipv4 & IPv6, Network Byte Order, Domain Name Server and IP Addresses, Mapping . Internet Service Providers, Types Of Connectivity Such As Dial-Up Leaded Vsat Etc. Web Technologies: Three Tier Web Based Architecture; Jsp, Asp, J2ee, .Net Systems

UNIT-II HTML CSS AND SCRIPTING

HTML - Introduction, Sgml, Dtd(Document Type Definition, Basic Html Elements, Tags and usages, HTML Standards , Issues in HTML Dhtml: Introduction Cascading Style Sheets: Syntax .Class Selector, Id Selector Dom (Document Object Model) & Dso (Data Source Object) Approaches To Dynamic Pages: Cgi, Java Applets, Plug Ins, Active X, Java Script – Java Script Object Model, Variables-Constant – Expressions, Conditions- Relational Operators- Data Types – Flow Control – Functions & Objects-events and event handlers – Data type Conversion & Equality – Accessing HTML form elements

UNIT-III XML

What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data ,Defining Attributes & Entities in the DTD ,Defining Parameter Entities & conditional Sections, Resolving a naming conflict, Using Namespaces, Designing an XML data structure, Normalizing Data, Normalizing DTDS

UNIT-IV INTERNET SECURITY & FIREWALLS

Security Threats From Mobile Codes, Types Of Viruses, Client Server Security Threats, Data & Message Security, Various electronic payment systems, Introduction to EDI, Challenges–Response System, Encrypted Documents And Emails , Firewalls: Hardened Firewall Hosts, Ip- Packet Screening, Proxy Application Gateways, Aaa (Authentication , Authorization And Accounting).

UNIT-V WEBSITE PLANNING & HOSTING

Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Registration Of Site On Search Engines And Indexes, Introduction To File Transfer Protocol, Public Domain Software, Types Of Ftp Servers (Including Anonymous),Ftp Clients Common Command. Telnet Protocol, Server Domain, Telnet Client, Terminal Emulation. Usenet And Internet Relay Chat

Outcomes: After successful completion of the course, student will be able to

- Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, Javascript, and web applications
- Analyze a web page and identify its elements and attributes.
- Create XML documents and XML Schema

Text Books

1. Internet & Intranet Engineering,- Daniel Minoli, TMH.
- 2 .Alexis Leon and Mathews Leon – Internet for Every One, Tech World.

Reference Books

1. Eric Ladd, Jim O’Donnel –“Using HTML 4, XML and JAVA”-Prentice Hall of India - 1999.
2. “Beginning Java Script “– Paul Wilton – SPD Publications –2001.
3. Frontiers of Electronics of Commerce, Ravi kalakota & Andrew B. Whinston Addison Wesley
- 4 Advance Java– Gajendra Gupta , firewall Media

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: SUPPLY CHAIN MANAGEMENT
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.
Code: 300814(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective

The objective of this module is to provide the participants with a good knowledge on supply chain management and how these topics can be related with the organization and their business needs.

UNIT I FUNDAMENTALS OF SUPPLY CHAIN MANAGEMENT

Supply chain networks, Integrated supply chain planning, Decision phases in a supply chain, process view of a supply chain, supply chain flows, Overview of supply chain models and modeling systems, Supply chain planning: Strategic, operational and tactical, Understanding supply chain through process mapping and process flow chart.

UNIT II SCM STRATEGIES, PERFORMANCE

Supply chain strategies, achieving strategic fit, value chain, Supply chain drivers and obstacles, Strategic Alliances and Outsourcing, purchasing aspects of supply chain, Supply chain performance measurement: The balanced score card approach, Performance Metrics. Planning demand and supply: Demand forecasting in supply chain, Aggregate planning in supply chain, Predictable variability.

UNIT III PLANNING AND MANAGING INVENTORIES

Introduction to Supply Chain Inventory Management. Inventory theory models: Economic Order Quantity Models, Reorder Point Models and Multiechelon Inventory Systems, Relevant deterministic and stochastic inventory models and Vendor managed inventory models.

UNIT IV DISTRIBUTION MANAGEMENT

Role of transportation in a supply chain - direct shipment, warehousing, cross-docking; push vs. pull systems; transportation decisions (mode selection, fleet size), market channel structure, vehicle routing problem. Facilities decisions in a supply chain. Mathematical foundations of distribution management, Supply chain facility layout and capacity planning,

UNIT V STRATEGIC COST MANAGEMENT IN SUPPLY CHAIN

The financial impacts, Volume leveraging and cross docking, global logistics and material positioning, global supplier development, target pricing, cost management enablers, Measuring service levels in supply chains, Customer Satisfaction/Value/Profitability/Differential Advantage.

Outcomes: On completion of this program student will know how the Supply chain management is essential to company success and customer satisfaction and also how SCM knowledge and capabilities can be used to support medical missions, conduct disaster relief operations, and handle other types of emergencies. SCM also plays a role in cultural evolution and helps improve our quality of life.

REFERENCES

1. David Simchi-Levi, Philip Kaminsky, and Edith Simchi-Levi Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, Second Edition, , McGraw-Hill/Irwin, New York, 2003. 31
2. Sunil Chopra and Peter Meindel. Supply Chain Management: Strategy, Planning, and Operation, Prentice Hall of India, 2002.
3. Sunil Chopra & Peter Meindl, Supply Chain Management , Prentice Hall Publisher, 2001
4. Robert Handfield & Ernest Nichols, Introduction to Supply Chain Management , Prentice hall Publishers, 1999.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VIII
Subject: Biometrics
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.
Code: 300812(33)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective

The basic objective in offering this course is to study the state-of-the-art in biometrics technology can explore the way to improve the current technology. The students can learn and implement various biometrics technologies using advanced algorithm.

Unit I: Introduction of Biometrics

Biometrics: definition, history, basic working architecture, types; Performance measures of biometrics; applications and benefits of biometrics; design of biometrics; biometric identification versus verification.

Unit II: Face and Iris Biometrics

Background of face and iris recognition; Face recognition methods: Eigen face methods, contractive transformation method; Challenges of face biometrics; Design of iris biometrics: image segmentation, image preprocessing, determination of iris region; Advantages and disadvantages of face and iris biometrics.

Unit III: Fingerprint and Sign Language Biometrics

Fingerprint matching: image acquisition, image enhancement and segmentation, image binarization, minutiae extraction and matching; Sign language biometrics: Indian sign language (ISL) biometrics, SIFT algorithm, advantages and disadvantages of ISL and fingerprint biometrics.

Unit IV: Biometric Cryptography and Privacy Enhancement

Introduction to biometric cryptography; general purpose cryptosystems; Cryptographic algorithms: DES and RSA; Privacy concerns and issues related to biometrics; biometrics with privacy enhancement; soft biometrics; comparison of various biometrics; Identity and privacy.

Unit V: Scope of Biometrics and Biometric Standards

Multimodal biometrics: basic architecture and fusion scheme, application, example of AADHAAR; scope and future market of biometrics; role of biometrics in enterprise and border security; DNA biometrics; biometric standards; biometric APIs.

Suggested Books:

1. Biometrics: concepts and applications by Dr G R Sinha and Sandeep B. Patil, Wiley India Publications, 2013.
2. Introduction to biometrics by Anil K Jain, Arun Ross and Karthik Nandakumar, Springer, 2011.
3. Biometrics Identity verification in a networked world by Samir nanawati, Michael Thieme and Raj Nanawati, US edition of Wiley India, 2012.

Course outcomes:

On completion of this program student will:

1. Understand the basic definition of 'Biometric Recognition' and the distinctive of this form of biometrics.
2. Be able to state precisely what functions these systems perform.
3. Be able to draw a system-level diagram for any biometric system and discuss its components.
4. Be able to solve verification, identification, and synthesis problems for a variety of biometrics such as fingerprint, face, iris, hand gestures and cryptography.
5. Be able to use the biometrics ingredients of existing system to obtain a given security goal.
6. Judge the appropriateness of proposal in research papers for a given applications.
7. Be able to design a biometric solution for a given application.

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Decision Support and Executive Information System

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.

Code: 300854(33)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

1. To review and clarify the fundamental terms, concepts and theories associated with Decision Support Systems, computerized decision aids, expert systems, group support systems and executive information systems.
2. To examine examples and case studies documenting computer support for organizational decision making, and various planning, analysis and control tasks.
3. To discuss and develop skills in the analysis, design and implementation of computerized Decision Support Systems.

UNIT-I Decision Support System:

What is a DSS, Decision Making Rational Decisions, Definitions of Rationality, Bounded Rationality and Muddling Through, The Nature of Managers, Appropriate Data Support, Information Processing Models, Group Decision Making?

UNIT-II Component OF DSS:

Data Component : Information and its Usefulness, Characteristics of Information, Databases to Support Decision Making, Database Management Systems, Data Warehouses, Data Mining and Intelligent Agents Model Component: Models Representation Methodology, Time Model Based Management Systems, Access to Models Understandability of Results, Integrating Models Sensitivity of a Decision, Brainstorming and Alternative Generation, Evaluating Alternatives, Running External Models. Mail Component: Integration of Mail Management Examples of Use implications for DSS.

Unit-III Intelligence and Decision Support Systems:

Programming Reasoning, Backward Chaining Reasoning, Forward Chaining Reasoning, Comparison, Certainty Factors, User-Interface Component: User Interface Components, The Action Language, Menus, Command Language, I/O Structured Formats, Free Form Natural Language, The Display or Presentation Language, Windowing Representations, Perceived Ownership of Analyses, Graphs and Bias Support for All Phases of Decision Making, The Knowledge Base Modes of Communication

Unit-IV Designing A DSS: Planning for DSS, Designing a Specific DSS, Interviewing Techniques,

Other Techniques, Situational Analysis Design Approaches, Systems Built from Scratch,

Using Technology to Form the Basis of the DSS, Evaluating a DSS Generator, Using a DSS Generator, The Design Team, DSS Design and Re-engineering Discussion .

Unit-V Implementation and Evaluation of DSS : Implementation Strategy , Prototypes, Interviewing , User Involvement , Commitment to Change, Managing Change, Institutionalize System, Implementation and System Evaluation, Technical Appropriateness, Measurement Challenges , Organizational Appropriateness.

Course outcomes:

On completion of this program student will:

1. Recognize the relationship between business information needs and decision making
2. Appraise the general nature and range of decision support systems
3. Appraise issues related to the development of DSS

Name Of Text Books:-

Decision Support System By Vicki I Sauter

Management Information system-Gerald V. Post & David L. Anderson

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII
Subject: Software Technology
Total Theory Periods: 50
Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.
Code: 300855(22)
Total Tutorial Periods: NIL
Minimum number of CT to be conducted: 02

Course Objective

- The basic objective in offering this course is to be employed as a practicing engineer in fields such as design, research, development, testing, and manufacturing

UNIT-1 ASSEMBLY LANGUAGE PROGRAMMING

Pentium Assembly languages-Registers, Memory Model, Addressing mode, 1source Link, Installation, Assembler Directives. ASSEMBLER DESIGN Simple manual Assembler, Assembler Design Process, Load and Go Assembler, Object File Formats.

UNIT-2 LINKERS

Linking -Combining Object Modules, Pass I, Pass II; Library Linking; Position Independent Code (PIC); Shared Library Linking. LOADERS- Binary Image; Types of Loaders.

UNIT 3

MACROPROCESSORS

Macro in NASM- Local Labels in Macro Body, Nested Macros.; Design of Macroprocessors – Major Data Structures, Macroprocessing Technique, Simple macroprocessors without nesting, Nested calls & definitions

UNIT – 4 COMPILERS

Lexical Analysis; Syntax Analysis; Intermediate Code Generation; Target Code Generation; Optimizing Transformation

UNIT – 5 TEXT EDITORS

Design of a Text Editor ; Data Structures for Text Sequences; Text Document Design; Text view Design
DEBUGGER Features; Breakpoint mechanism; Hardware support; context of Debugger; Check pointing & reverse Execution

Outcomes: After successful completion of the course, student will be able to

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.

Textbooks

1. SYSTEM SOFTWARE by Santanu Chattopadhyay ; Prentice Hall of India
2. Software Engineering By Roger S Pressman ; Mc -Graw Hill

References

1. Foundations of Software Technology and Theoretical Computer Science, By V. (Venkatesh) Raman: Springer
2. Software Visualization by John Stasko; MIT press
3. Software Engineering By Rajib Mall : PHI

CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VIII

Subject: Bio Informatics

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Branch: Computer Science & Engg.

Code: 300801(22)

Total Tutorial Periods: NIL

Minimum number of CT to be conducted: 02

Course Objective

1. This course aims to provide students with a practical and hands-on experience with common bioinformatics tools and databases.
2. Students will be trained in the basic theory and application of programs used for database searching, protein and DNA sequence analysis, prediction of protein function.

UNIT-1

Bioinformatics-introduction, Application, Data Bases and Data Management, Central Dogma; information search and Data retrieval, Genome Analysis and Gene mapping- Analysis, Mapping, Human Genome Project (HGP).

UNIT-2

Alignment of Pairs and Sequences; Alignment of Multiple Sequences and Phylogenetic Analysis; Tools for similarity Search and Sequence Alignment- FASTA BLAST.

UNIT-3

Profiles and Hidden Markov Models (HMMs); Gene Identification and Prediction-Basics, Pattern Recognition, Methods and Tools; Gene Expression and Micro arrays.

UNIT-4

Protein Classification and Structure Visualization; Protein Structure Prediction; Proteomics; Computational methods-Analysis of Pathways, Metabolic Network Properties, Metabolic Control Analysis, Stimulation of Cellular Activities, Biological Mark Up Languages.

UNIT-5

Drug Discovery-Introduction, Technology and Strategies, Cell Cycle, G-protein, Coupled, Receptors. Computer Aided Drug Design-Introduction, Drug Design Approaches, Designing methods, ADME-Tox Property Prediction.

Outcomes: After successful completion of the course, student will be able to have a good working knowledge of basic bioinformatics tools and databases such as GenBank, BLAST, multiple alignment, and phylogenetic tree construction. Further students will understand the basic theory behind these procedures and be able to critically analyze the results of their analysis using such tools.

TEXT BOOKS

- I. BIOINFORMATICS by S.C. Rastogy, 2nd Edition, Prentice Hall of India. II. BIOINFORMATICS by V. R Srinivas, Prentice Hall of India

REFERENCES

1. BIOINFORMATIC COMPUTING by Bergeron, MIT Press.
2. Evolutionary Computation in Bioinformatics, Gary B. Fogel, David W. Corne (Editors), 2002
3. Introduction to Bioinformatics, Arthur M. Lesk, 2002, Oxford University Press
4. Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors), 2002, MIT Press