Department of Computer Science & Engineering
MATS University
Aarang, Raipur (C.G.)
Syllabus Scheme of B. Tech.
V Semester

S. No.	Code	Subject	L	T	P	ESE	IM	Total Credit
			Periods per Week			**Scheme of Marks**		
1.	BT520	Theory of Computation	4	0	-	70	30	4
2.	BT521	Analysis and Design of Algorithms	4	0	-	70	30	4
3.	BT522	Unix & Shell Programming	4	0	-	70	30	4
4.	BT523	Microprocessor & Interfacing	3	0	-	70	30	3
5.	BT524	Java Programming	4	0	-	70	30	4
6.	**BT525x**	**Open Elective - II**	3	0	-	70	30	3
7.	BT526	Web Application Development Lab (PHP & My SQL)	-	-	2	30	20	1
8.	BT527	Unix & Shell Programming Lab	-	-	2	30	20	1
9.	BT528	Java Programming Lab	-	-	2	30	20	1
10.	BT529	Microprocessor Lab	-	-	2	30	20	1
		Total	**22**	**0**	**8**	**540**	**260**	**26**

L – Lecture, T – Tutorial, ESE – End Semester Examination, P – Practical,   IM – Internal Marks

Open Elective – II

Subject Code	Subject Name
BT5251	Management Information System
BT5252	Innovative Entrepreneurial Skill
BT5253	Disaster Management
BT5254	Professional Ethics in Engineering
BT5255	Intellectual Property Rights

THEORY OF COMPUTATION (BT520)

Course Objective:
1. To study mathematical foundations of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
2. To enhance/develop students' ability to understand and conduct mathematical proofs for computation and algorithms.

UNIT – I FINITE 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 Epsilon moves, Conversion of NFA to DFA by Arden's method, minimizing number of states of a DFA, My-hill 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 From, Greibach Normal Form, Properties of Context Free Language, Pumping Lemma from Context Free Language, Decision Algorithm for Context Free 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 problems, Universal Turing Machine and other modifications.

UNIT – V COMPUTABILITY
Introduction and Basic concepts, 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, Church's Hypothesis, Post correspondence problem, Halting problem of Turing Machine.

Text Books:
1. Introduction to Automata theory, Language and Computation; John E. Hopcropt & J. D. Ullman, Pearson.
2. Theory of Computer Science (Automata, Languages & Computation), K.L.P. Mishra and N. Chandrasekaran, PHI.

Reference Books:
1. Theory of Automata and Formal Language, R.B. Patel & Prem Nath, Umesh Publication.
2. An Introduction to Automata Theory and Formal Languages, Adesh K. Pandey, S. K. Kataria & Sons.
3. Theory of Computation, A. M. Natrajan, A. Tamilarasi, P. Balasubramani, New Age International.

Course Outcome:
After completion of the course study, students will be able to
1. Analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.
2. Demonstrate algorithm, computability, decidability, and complexity through problem solving.
3. Prove the basic results of the Theory of Computation.

ANALYSIS AND DESIGN OF ALGORITHMS (BT521)

Course Objective:
1. To give idea of mathematical preliminaries required to analyze and design computer algorithms.
2. To introduce general tools and techniques for analyzing computer algorithms.
3. To introduce the classic algorithms in various domains, and techniques for designing efficient algorithms.

UNIT – I INTRODUCTION & ANALYSIS
Analyzing Algorithms, Algorithm Types, Recurrence Equations, Growth Function: Asymptotic Notation, Standard Notation and Common Functions, Recurrence Relation, Different Methods of Solution of Recurrence Equations with Examples.

UNIT – II DIVIDE AND CONQUER
Introduction to Divide and Conquer Paradigm, Quick and Merge Sorting Techniques, The Basic Divide and Conquer Algorithm for Matrix Multiplication, Heaps and Introduction to 2-3 Trees, Algorithms for manipulating 2-3 Trees, Representation of Heaps using 2-3 Trees, Red Black Tree, Heap Sort, Shell Sort & Bucket Sort, Amortized Analysis.

UNIT – III DYNAMIC PROGRAMMING & GREEDY PARADIGM
The Basic Dynamic Programming Paradigm, Dynamic Programming Solution To The Optimal Matrix Chain Multiplication and the Longest Common Subsequence Problems, Greedy Paradigm: The Basic Greedy Strategy and Computing Minimum Spanning Trees, Algorithms of Kruskal and Prim, Huffman Trees.

UNIT – IV GRAPH ALGORITHMS
Depth First Search and Breadth First Search on Graphs, Computation of Biconnected Components and Strongly Connected Components using DFS, Topological Sorting of Nodes of an Acyclic Graph and Applications, Shortest Path Algorithms on Graphs: Bellman-Ford Algorithm, Dijkstra's Algorithm and Analysis of Dijkstra's Algorithm using Heaps, Floyd-Warshall's All Pairs Shortest Path Algorithm.

UNIT – V BACKTRACKING & NP-COMPLETE PROBLEMS
Backtracking and Recursive Backtracking, Applications of Backtracking Paradigm ,8-Queens Problem, Sum Of Subsets, Graph Coloring, Hamiltonian Cycle ,0/1 Knapsack Problem, Travelling Salesman Problem, Introduction To NP-Hard and NP-Completeness, Cook's Theorem.

Text Book:
1. Introduction to Algorithms; Cormen, Lelserson, Rivert; Prentice Hall of India.
Reference Books:
1. The Design & Analysis of Computer Algorithms, Hopcroft – Aho – Ullman, AWL.
2. Fundamentals of Computer Algorithms; Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran; Galgotia Publications Pvt. Ltd.
3. Design and Analysis of Algorithms; Paneerselvam; Prentice-Hall of India.

Course Outcome:
After completion of the course study, students will be able to
1. Analyze and design computer algorithms.
2. Analyze the complexities of various problems in different domains
3. Apply the algorithms and design techniques to solve problems.

Course Objective:
1. To give basics of Linux environment.
2. To learn the fundamentals of shell scripting/programming
3. To learn Linux shell script programming.

UNIT – I INTRODUCTION

Introduction to Operating System, Multi-user system, Architecture of Unix, Features & Benefits, Services provided by Unix operating System, Versions of Unix, Un ix Commands: who, uname, passwd, date, man, echo, printf, script, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip etc.

Unix Utilities: 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

Introduction to Shell: Type of Shells (Bourne Shell, C Shell, Korn Shell), 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.

Shell Programming: Shell variables, Scripts, Meta Characters and Environment, if, and case statements, for, while, and until loops.

UNIT – III GREP AND AWK PROGRAMMING

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, Mathematical Functions, User – Defined Functions, using system commands in awk, Applications, awk and grep, sed and awk.

UNIT – IV INTERNAL REPRESENTATION OF FILES

System Calls for the File System, INODES, Structure of Regular File, Directories, Conversions of a Path, Name to an INODE, Super Block, INODE Assignment to a New File, Allocation of Disk Blocks, Open, Read, Write, File and Record Close, File Creation, Creation of Special Files Change Directory and Change Root, Change Owner and Change Mode, STAT and FSTAT, PIPES, Mounting and Un-mounting Files System, Link, Unlink.

UNIT – V STRUCTURES OF PROCESSES AND PROCESS CONTROL

Process States and Transitions Layout of System Memory, The Context of a Process, Manipulation of the Process Address Space, Sleep Process Creation/Termination, User ID Process, Changing the Size of a Process, Shell, Case Study of Various LINUX Versions.

Text Books:
1. The Design of Unix Operating System, Maurice J. Bach, Pearson Education
2. Advance UNIX a Programmer's Guide, S. Prata, BPB Publications, New Delhi.
3. Unix Concepts and Applications, Sumitabha Das.

Reference Books:
1. The UNIX Programming Environment, B.W. Kernighan & R. Pike, Prentice Hall of India.
2. Guide to UNIX Using LINUX, Jack Dent Tony Gaddis, Vikas/ Thomson Pub. House Pvt. Ltd.

Course Outcome:

After completion of the course study, students will be able to
1. Work in Linux environment.
2. Develop shell scripts/programs.

MICROPROCESSOR & INTERFACING (BT523)

Course Objective:
1. To introduce 8085 architecture and programming in assembly language/C/C++.
2. To introduce basic concepts of interfacing memory and peripheral devices to a microprocessor.
3. To introduce various advanced processor architectures.

UNIT – I MICROPROCESSOR ARCHITECTURE
Introduction to Microprocessors, Architecture of 8085, Pin Configuration and Function; internal register & flag register, Generation of Control Signals: Bus Timings: Demultiplexing of address / data bus; Fetch Cycle, Execute Cycle, Instruction Cycle, Instruction Timings and Operation Status, Timing Diagram.

UNIT – II INSTRUCTION SET AND PROGRAMMING WITH 8085
Instruction for Data Transfer, Arithmetic & Logical Operations, Branching Operation: Machine Cycle Concept; Addressing Modes; Instructions Format: Stacks. Subroutine & related Instructions. Elementary Concepts of Assemblers, Assembler Directives, Looping and Counting: Software Counters with Time Delays: Simple Programs using Instruction Set of 8085: Debugging: Programs Involving Subroutines. Programs for Code Conversion e.g. BCD to Binary, Binary to BCD. Binary to Seven-Segment LED Display. Binary to ASCII. ASCII to Binary: Program for Addition Subtraction: Programs for Multiplication and Division of Unsigned Binary Numbers.

UNIT – III ASSEMBLY LANGUAGE PROGRAMMING WITH C/C++, INTERFACING 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++, Memory Interface of 8085 microprocessor, Basic I/O Interface, Introduction to I/O Interface, Timing diagram of 8085 microprocessor.Direct Memory Access: Basic DMA Operation and Definition.

UNIT – IV INTERRUPTS AND PERIPHERAL INTERFACING DEVICES
Hardware and software Interrupts, Interrupt Processing; Multiple Interrupts and Priority Concepts, Interrupt Structure of 8085, Instructions related to interrupts, Application of Interrupts and Illustrative Programs,Architecture, Pin Diagram and functioning of 8155/8156 (RAM), 8355/8755 (ROM), 8255 (PPI),USART (8251)

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, Comparative Study of Modern Microprocessor (Web based Reference for study): Pentium Pro(Pentium II,Pentium III,PentiumIV),Corei3,i5,i7and Atomprocessors.

Text Books:
1. Microprocessor Architecture, Programming and Application, R. S. Gaonkar, Wiley Eastern
2. Digital Systems – From Gates to Microprocessors, Sanjay K. Bose, New Age International Publishers.

Reference Books:
1. 8085 Microprocessor Programming & Interfacing, N.K. Srinath, PHI
2. Digital Computer Electronics, Malvino, TMH
3. Microprocessors: Theory and Applications, Intel and Motorolla, Rafiquuzzaman, PHI.
4. 0000 to 8085: Introduction to Microprocessor for Engineers and Scientists, Ghosh & Sridhar, PHI
5. Advanced Microprocessors & IBM-PC Assembly Language Programming, K. Udaya Kumar & B. S. Umashankar, TMH2003.
6. Microprocessor: Theory and Applications-Intel and Motorolla, Rafiquuzzaman, PHI.

Course Outcome:
After completion of the course study, students will be able to
1. Analyze, specify, design, write and test assembly language/C/C++ programs of moderate complexity.
2. Select an appropriate architecture or program design to apply to a particular situation.
3. Design and build the necessary program for microprocessor.

JAVA PROGRAMMING (BT524)

Course Objective:
1. To learn the fundamentals of JAVA programming.
2. To understand fundamentals of object oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. To learn the concepts of graphical user interfaces, basic data structures.

UNIT- I INTRODUCTION
Concept of OOPs, Introduction to Java: Data types, Variables, Literals, Expressions, Operators, Arrays and Programming Constructs, Garbage Collection, Comparison with C++, Java Virtual Machine, Java Class Libraries, JIT, Overview of Java Technology, Applets, Beans, RMI, Servlets, JSP, JSF, CORBA.

UNIT – II CLASSES AND OBJECTS
Classes and Objects, Objects and References, Method: Defining, Calling & Passing Arguments to Method, This keyword, Overloading Method, Static, Access Specifiers: Public, Default, Private & Protected, Command Line Arguments, Constructors and Finalizers, Overloading Constructors, Inner Classes. Introduction to Inheritance: Definition and Advantages, Overriding, Super, Final and Abstract Classes, Interface, Package.

UNIT- III EXCEPTIONS, STRING AND VECTOR
Exception Handling: Basics, Default Exception Handling, Try and Catch, Multiple Catch Statements, Try-Catch-Finally, Use of throw and throws.
Strings: String Constructor, String Arithmetic, String Methods, String Buffer and Methods, Introduction and Programming using Vector, Iterator and Enumeration.

UNIT -IV MULTITHREADING
Thread Concepts, Thread lifecycle, Runnable Vs Thread Class, Thread Priority, Thread Methods, Thread Synchronization, Concept of Monitor, Synchronized Methods & Synchronized Blocks. Internet Programming With Java: AWT, Applets and its Application, User Interfacing Components, Events and Event Handling, Overview of Swing Components, Java Database Connectivity: JDBC, ODBC, Executing DDL, DML Commands, Statement, Prepared Statement and Callable Statement, Java Stored Procedures.

UNIT- V INTRODUCTION TO SERVLETS
Lifecycle of a Servlet, JSDK, Servlet API, Java X Servlet Package, Reading Servlet Parameters, Reading Initialization Parameters, Java X Servlet HTTP package, Handling http Request & Response, Use of Cookies, Session Tracking, Security Issues, Java Servlet API, Some Important Servlet Method.

Text Books:
1. Java Complete Reference, Herbert Schildt, Tata McGraw Hill.
2. Java: How to Program, Dietel H. M. and Dietel P. J., Pearson Prentice Hall.

Reference Books:
1. Programming with Java, John Hubbard, Schaum's Out Line.
2. Java 2 Black Book, Steven Holzner.
3. Java Examples: In a Nutshell, David Flanagan, O'Reilly Media.
4. Core Java, Cay S. Horstmann.

Course Outcome:
After completion of the course study, students will be able to
1. Implement, compile, test and run Java programs with concept of Object Oriented Programming.
2. Develop solutions for a range of problems using object-oriented programming.
3. Use simple data structures in a problem.
4. Develop graphical user interface using JAVA.

WEB APPLICATION DEVELOPMENT LAB (PHP & MYSQL) (BT526)

1. Introduction to PHP: History, syntax, comments, Variable, data type, operators, exception.

2. Write a program in PHP to print the current date.

3. Write a program in PHP to explain how data are stored in variables.

4. Write a program in PHP to print a pattern using loop.

5. Write a program to insert values in 1-D array and print it in increasing and decreasing order.

6. Write a program to explain if…else and switch statement.

7. Write a program to explain GET and POST method.

8. Design a form containing buttons, drop down list, check box and various other tools.

9. Design a form displaying student mark sheet.

10. Design a railway reservation form.

11. Write a program which has a data base connectivity and contain all following Button FIND, ADD, DELETE, MODIFY,CANCEL. Give proper code to perform the activity described by the buttons.

12. Write a program to explain file handling : open, read , write , append , truncate , delete

UNIX & SHELL PROGRAMMING LAB (BT527)

1. a) Write a shell script to list all of the directory files in a directory.

   b) Write a shell script to find the number of files in a directory.

2. a) Write a shell script to check whether a file exists or not.

   b) Write a shell script to find the mode of a file in a directory.

   c) Write a shell script to copy the source file to the target file.

3. a) Write a shell script to accept three numbers and display the largest.

   b) Write a shell script to display first ten positive numbers using until loop.

   c) Write a shell script to print the first 10 odd numbers using the while loop.

   d) Write a shell script which will accept different numbers and find their sum.

4. a) Write a shell script to find factorial of a given integer.

   b) Write a shell script to generate Fibonacci series.

5. a) Write a shell script to reverse the digits of a given number.

   b) A five digit number is input through the keyboard. Write a shell script to calculate the sum of its digits.

6. a) 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.

   b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

7. a) 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.

   b) 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.

8. a) Write an awk script to count the number of lines in a file that do not contain vowels.

   b) Write an awk script to find the number of characters, words, and lines in a file.

9. Write a shell script to check if a particular user has logged in or not. If not, continue the loop till he/she logins. Once the required user logins display a message.

10. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:

    a) File type

    b) Number of links

    c) Time of last access

    d) Read, write, and execute permissions.

11. a) 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.

    b) Write a menu driven program to display a menu of options and depending upon the user's choice executes the associated command.

c) 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.

12. a) Write a C program that makes a copy of a file using standard I/O and system calls.

    b) Write a C program to emulate the UNIX ls –l command.

13. a) Write a C program to list for every file in a directory, its inode number and file name.

    c) 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.

14. a) Write a C program that demonstrates redirection of standard output to a file. E.g. ls –l > out.

    b) Write a C program that illustrates how to execute two commands concurrently with a command pipe. E.g.: ls –l | sort.

15. a) Write a C program to create a Zombie process.

    b) Write a C program that illustrates how an orphan is created.

16. a) Write a C program that illustrate communication between two unrelated processes using named pipe.

    b) 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.

    c) Write a C program (receiver.c) that receives the messages (from the above message queue) and displays them.

References:

1. Unix Shell programming, Yashwanth Kanitkar, 1st Edition, BPB Publisher

2. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson education.

3. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education

4. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

5. Unix Concepts and Applications, Sumitabha Das.

JAVA PROGRAMMING LAB (BT528)

1. Write a program to perform multiplication of two matrices.

2. Develop a program to illustrate a copy constructor so that a string may be duplicated into another variable either by assignment or copying.

3. Write a program to demonstrate concept of abstract class.

4. Write a program to implement concept of overloading.

5. Write a program to implement concept of overriding.

6. Write a program to implement concept of
   i. Packages
   ii. Inheritance
   iii. Interfaces

7. Write a program, which throws Arithmetic Exception. Write another class that handles the Exception.

8. Create an applet with a button and a text field. Write a Focus Event ( ) so that if the button has the focus, characters typed into it will appear in the text field.

9. Write a program to implement multithreading.

10. Write a program which illustrates the concept of Synchronization.

11. Create an applet with a text field and three buttons. When you press each button, make some different text appear in the text field. Add a check box to the applet created, capture the event and insert different text in the text field.

12. Create an applet with a button and a text field. Write a Focus Event ( ) so that if the button has the focus, characters typed into it will appear in the text field.

13. Write a program to implement JDBC/ODBC connectivity to data base using java program.

14. Write a program to connect MYSQL database to a java program.

15. Write a program to create a socket for client and server.

16. Write a program to set a connection between client and server using TCP/UDP.

17. Develop a servlet that gets invoked when a form on a web page in HTML is submitted. Create a cookie object and enter/display value for that cookie.

18. Write a Program to demonstrate various methods to input from keyboard.

19. Write a program, which illustrates capturing of Mouse Events. Use Applet class for this.

20. Design a text editor, which is having some of the features of notepad.

21. Develop a front end for a contact management program using a flat file database. DB needs to be distributed or centralized.

MICROPROCESSOR LAB (BT529)

1. REVERSING AN ARRAY: A Block of 16 bytes are residing at locations starting from BLOCK 1. Write a program to transfer the block in reverse order at locations starting from BLOCK 2.

2. SORTING IN ASCENDING ORDER: A block (16 bytes are residing at locations starting from DATA: Write a program to arrange the word in the same location in ascending order.

3. BINARY ADDITION: 16 bytes are residing at location starting from DATA. WAP to add all bytes and store the result location SUM and SUM + 1

4. BCD ADDITION: 16 BCD NUMBER are residing at location starting from DATA. WAP to add all bytes and store the result location SUM and SUM + 1

5. MULTIPLICATION: Two bytes are residing at location DATA 1 and DATA 2. Write a program to multiply the two bytes and store the result at location PROD 1 and PROD 2.

6. BINARY TO BCD: A binary number is residing at location BIN > WAP to convert the binary number in to its equivalent BCD and store the result at BCD and BCD + 1

7. BCD TO BINARY: A BCD number is residing at location BCD ; Write a program to convert the BCD number into its equivalent binary and store the result at BIN

8. MULTIBYTE ADDITION: Two 10 bytes are residing at location starting from DATA 1 and DATA 2 respectively, Write a program two add them up and store the result at location starting from RESULT (result space 11 bytes)

9. MULTIBYTE BCD ADDTION: Two 6 digits BCD numbers are residing at location starting from DATA 1 and DATA 2 respectively. Write a program to add them up and store the result at locations starting from RESULT (Result space 7 bytes)

10. RST 6.5: A block of 16 bytes is residing at location starting from ; DATA Reverse the block and store the bytes at REVERSE whenever the RST 6.5 key is pressed.

11. EDITING OF ASCII STRING: A string of ASCII characters is residing at locations starting from READ which contain " I $ WILL $ BE $ AN $ ENGINEER ". Edit string in such a way that it should contain " I $ will $ be $ Engineer ". Keep the edited string in the same locations. Product the string from further editing. ($ stands for a blank)

12. SIGNED BINARY ADDITION: A block of 16-signed binary numbers is residing at locations NUMBERS. Add them up and store the result (in signed binary) at locations from RESULT.

13. ASCII CODE CONVERSION: A string of 16 ASCII characters are residing at locations starting from DATA. The string consists of codes for capital letters, small letters and BCD digits (0-9) . Convert the ASCII characters. In such a way that the codes for capital letters be converted into corresponding codes for small letters, codes for small letters into that of capital letters and codes for BCD digits into that of BCD numbers and store them at the same locations.

14. PARITY CHECK: A block of 32 bytes is residing at DATA count the number (BCD) of times even and odd PARITY bytes are appearing consecutive memory locations. Keep the count at MATCH.

15. SERIES GENERATION: Two BCD numbers a and b are residing at locations DATA 1 and DATA 2 respectively. Write a program to form a series in BCD with the elements of a. a + 2b, a + 4b, a + 6b, ………. Stop the generation of the series whenever any element of the series in BCD with the elements of the series exceeds (99). Store the result at locations starting from RESULT. Count the number (BCD) of elements in the series and store it at NUMBER.

List of Equipments/Machine Required: 8085 based microprocessor kit, MASM assembler, 8085 simulator, PCs.
Recommended Books: 8085 Microprocessor Programming & Interfacing – N.K. Srinath, PHI.

MANAGEMENT INFORMATION SYSTEM (BT5251)

Course Objective:
1. To learn about information system of business/organization.
2. To study information system development.
3. To apply critical thinking skills in identifying information systems problems and investigate existing literature about hardware and software solutions to problems.

UNIT I – MANAGEMENT AND ORGANIZATIONAL SUPPORT SYSTEM FOR DIGITAL FIRM
Definition of MIS, Systems approach to MIS, Report writing s/w, MIS and Human factor considerations, Concept of organizational information sub-system, MIS & problem solving, Case Studies.

UNIT II – INFORMATION SYSTEMS & BUSINESS STRATEGY
Information Management: Who are the users? Manager & Systems, Evolution of Computer Based Information System (CBIS), Model of CBIS. Information services organization: Trend to End-User computing, justifying the CBIS, Achieving the CBIS, Managing the CBIS, Benefits & Challenges of CBIS implementation. Strategic Information System, Business level & Firm level Strategy, Case Studies.

UNIT III – INFORMATION SYSTEMS IN THE ENTERPRISE
Systems from Management & Functional Perspective & their relationship: Executive Information System, Decision Support System, Sales & Marketing Information System, Manufacturing Information System, Human-Resource Information System, Finance & Account Information System, Case Studies.

UNIT IV – INFORMATION TECHNOLOGY FOR COMPETITIVE ADVANTAGE
Firm in its environment, what are the information Resources? Who manages the information resources? Strategic Planning for Information Resources, End-User Computing as a strategic issue, Information Resource Management concept, Case Studies.

UNIT V – E-COMMERCE & INTERNATIONAL INFORMATION SYSTEM
Introduction to E-Commerce, Business Intelligence, E-Commerce Strategy, Electronic Data Interchange, E-commerce Methodology, E-commerce Technology, and Business Application of the Internet, Electronic Business Success Strategies, and Managing International Information Systems: IIS architecture, Global Business Drivers, Challenges, Strategy: Divide, Conquer, Appease, Cooptation, and Business organization, Problems in implementing global information systems, Computer crime, Ethics & social issues.

Text Books:
1. Management Information System: A Concise Study; S. A. Kelkar, PHI.
2. Management Information System: Managing the Digital Firm; Kenneth C. Laudon & Jane P. Laudon, Pearson Education.

Reference Books:
1. Management Information System; Suresh K. Basandra, A. H. Wheeler Publishing Company Limited.
2. Analysis & Design of Information Systems; James A. Senn, McGraw Hill.

Course Outcome:
After completion of the course study, students will be able to
1. Describe the advancement in the field of Management Information System and how they affect the way of business conduction.
2. Identify which information technology tools are used to solve the particular business problem.
3. Manage information for an organization.

INNOVATIVE ENTREPRENEURIAL SKILL (BT5252)

Course Objective:
1. To understand the concept of innovation and applicability of innovation in entrepreneurship.
2. To identify and analyze the opportunities for entrepreneurship and innovation.
3. To understanding industry dynamics and factors for developing successful innovations and apply this understanding to innovations in various sectors.

UNIT – I INNOVATION
An Abstract Concept, Creativity, Innovation and Imagination, Types of Innovation, classification according to products, Processes or Business Organizations.

UNIT – II ENTREPRENEURSHIP
Who is an Entrepreneur? Entrepreneurship: A state of Mind, Emergence of entrepreneur, Role of Entrepreneur, A Doer not a Dreamer, Characteristics of an Entrepreneur, Factors affecting Entrepreneurial Growth: Social, Cultural, Personality Factors, Psychological and Social Factors, Impact of Entrepreneurship for Sustainable Development.

UNIT – III ENTERPRENEUR vs. ENTERPRENEURSHIP
Difference between Entrepreneur and Entrepreneurship, Difference between Entrepreneur and Intra-preneur, Common Entrepreneurial Competencies/Traits, Entrepreneurship Stimulants, Obstacles Inhibiting Entrepreneurship, Types of Entrepreneurs, Functions of an Entrepreneur.

UNIT – IV IDENTIFICATION OF BUSINESS OPPORTUNITIES
Introduction, Sources of Business Product Ideas, Steps in Identification of Business Opportunity and its SWOT Analysis.

UNIT – V TECHNO ECONOMIC FEASIBILITY OF THE PROJECT
Introduction, Techno Economic Feasibility of the Project, Feasibility Report, and Considerations while preparing a Feasibility Report, Proforma of Feasibility Report, Role of Institutions and entrepreneurship.

Text Books:
1. Competing through Innovation, Bellon & Whittington, Prentice Hall of India
2. A Guide to Entrepreneurship, David Oates- JAICO Publishing House.

Reference Books:
1. Entrepreneurship, Rober D Hisrich, Peters, Shepherd- TMH
2. Entrepreneurship in Action, Coulter, Prentice Hall of India.
3. Entrepreneurship Management and Development, Ajith Kumar, HPH.
4. Fundamentals of entrepreneurship- Mohanty, PHI.
5. Patterns of Entrepreneurship- Jack M Kaplan, Wiley, student Edit

Course Outcome:
After completion of the course study, students will be able to
1. Apply innovative skills in entrepreneur activity.
2. Have entrepreneurship in leading sectors.

DISASTER MANAGEMENT (BT5253)

Course Objective:
1. To introduce disaster, its nature and types.
2. To understand disaster zoning and hazard assessment.
3. To know about the disaster mitigation and preparedness.
4. To understand management during disaster and construction technology for its mitigation.
5. To identify relief measures.

UNIT – I INTRODUCTION
Nature of Disasters, Natural and Other Disasters, Earthquakes, Floods, Draught, Cyclones, Fire, and other Environmental Disasters.

UNIT – II DISASTER ASSESSMENT
Behavior of structures in Disaster Prone Areas, Disaster Zoning, Hazard Assessment, Environmental Impact Assessment

UNIT – III DISASTER PROTECTION
Methods of Mitigating Damage during Disasters, Disaster Preparedness.

UNIT – IV DISASTER MANAGEMENT
Management Systems during Disasters, Construction Technology for Mitigation of Damage of Structures.

UNIT – V RELIEF MEASURES
Short Term, and Long Term Relief Measures.

Text Books:
1. Design of Earthquake Resistant Buildings – Minoru Wakabayashi (McGraw Hill Publication).
2. Dynamics of Structures: Theory and Application to Earthquake Engineering (2nd edition), Anil K Chopra (Pearson Education Publication)

Reference Books:
1. Fundamentals of Vibrations – Anderson, R.A. (Mc Millan) IS – 1893 (Part I): 2002, IS – 13920: 1993, IS – 4326: 1993, IS-13828: 1993
2. Earth quake engineering damage assessment and structural design – S.F. Borg Disasters and development – Cuny F (Oxford University Press Publication)

Course Outcome:
After completion of the course study, students will be able to
1. Explain disaster and its nature.
2. Understand impact and hazard assessment.
3. Understand disaster preparedness and mitigation.
4. Use construction technology for disaster management.
5. Identify short term and long term relief measures.

Course Objective:
1. To study about engineering Ethics, variety of moral issues and moral dilemmas, professional Ideals and virtues.
2. To learn basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards, Exposure to Safety and Risk, Risk Benefit Analysis.
3. To learn Collegiality and Loyalty, Collective Bargaining, Confidentiality, Occupational Crime, Professional, Employee, Intellectual Property Rights.

UNIT – I MORALS AND ETHICS IN ENGINEERING

Senses of Engineering Ethics, Variety of Moral Issues, Types of Inquiry, Moral Dilemmas, Moral Autonomy, Kohlberg's Theory, Gilligan's theory, Indian Theory Consensus and Controversy, Professions and Professionalism, Professional Ideals and Virtues, Uses of Ethical Theories.

UNIT – II ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as Experimentation, Engineers as Responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards, A Balanced Outlook on Law, The Challenger Case Study, Titanic disaster as Case Study.

UNIT – III ENGINEER'S RESPONSIBILITY FOR SAFETY

Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis, Reducing Risk, The Government Regulator's Approach to Risk, Disasters at Chernobyl and Bhopal (Case Studies).

UNIT – IV RESPONSIBILITIES, RIGHTS AND ACCOUNTABILITY

Collegiality and Loyalty, Respect for Authority, Collective Bargaining, Confidentiality, Conflicts of Interest, Occupational Crime, Professional Rights, Employee Rights, Intellectual Property Rights (IPR), Discrimination.

UNIT – V GLOBAL ISSUES

Multinational Corporations: Business Ethics, Environmental Ethics, Computer Ethics, Role in Technological Development, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Honesty, Moral Leadership, Sample Code of Conduct.

Text Books:
1. Ethics in Engineering, Mike Martin and Roland Schinzinger, McGraw Hill, New York, 2005.

Reference Books:
1. Engineering Ethics Concepts and Cases, Charles E Harris, Michael S Pritchard and Michael J Rabins, Thompson Learning, 2000.
2. Engineering Ethics, Charles D Fleddermann, Prentice Hall, New Mexico, 1999.
3. Ethics and the Conduct of Business, John R Boatright, Pearson Education, 2003.
4. Fundamentals of Ethics for Scientists and Engineers, Edmund G Seebauer and Robert L Barry, Oxford University Press, 2001.
5. Business Ethics – An Indian Perspective, Prof. (Col) P S Bajaj and Dr. Raj Agrawal, Biztantra, New Delhi, 2004.

Course Outcome:
After completion of the course study, students will be able to
1. Have perception of profession, professional ethics, various moral & social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
2. Know professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.
3. Acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

INTELLECTUAL PROPERTY RIGHTS (BT5255)

Course Objective:
1. To provide an overview of Intellectual Property Right.
2. To study the complexities involved in the process of attributing intellectual property rights to people.
3. To learn the legalities of intellectual property to avoid plagiarism, copyright infringements etc.

UNIT – I INTRODUCTION
Basic Concepts of Intellectual Property: Introduction to Intellectual Property Rights, Laws and its Scope, Trade Related Aspects of Intellectual Property Rights.

UNIT – II PATENTS
Patents: Introduction to Patent Law and Condition for Patentability, Procedure for Obtaining Patents, Rights of a Patentee, Patent Infringements, Biotechnology Patents and Patents on Computer Programs, Patents from an International Perspective.

UNIT – III TRADEMARK AND GEOGRAPHICAL INDICATIONS
Statutory Authorities and Registration Procedure, Rights Conferred by Registration, Licensing, Assignment and Transfer of Trademark Rights, Trademark Infringement, Geographical Indication of Goods & Appellations of Origin.

UNIT – IV COPYRIGHT
Registration Procedure, Copyright Authorities, Assignment & Transfer of Copyright, Copyright Infringement and Exceptions to Infringement, Software Copyright.

UNIT-V LAW ON DESIGNS
Introduction to the Law on Industrial Designs, Registration and Piracy, International Perspective, Introduction to the Law on Semiconductor Layout Design, Registration, Commercial Exploitation and Infringement.

Text Books:
1. Managing Intellectual Property, Vinod V Sople, PHI
2. Cyber Law, Intellectual Property and E-Commerce Security, Kumar K, Dominent Publication And Distribution, New Delhi.
Reference Books:
1. Inventors Guide to Trademarks and Patents, Craig Fellenstein, Rachel Ralson- Pearson Education.
2. Intellectual Property, David Bainbridge, Longman.

Course Outcome:
After completion of the course study, students will be able to
1. Identify different types of Intellectual Properties, right of ownership, scope of protection as well as the ways to create and to extract value from Intellectual Property.
2. Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
3. Identify activities and constitute Intellectual Property infringements and the remedies available to the owner and describe the precautious steps to be taken to prevent infringement of proprietary rights in products and technology development.