

**DRAFT SYLLABUS OF DIPLOMA ENGINEERING
(3rd Semester to 6th Semester)**

BRANCH : COMPUTER SCIENCE & TECHNOLOGY

Under

**TRIPURA UNIVERSITY
(A Central University)
Suryamaninagar**

Curricular Structure

3rd Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / practical	Mark	CPW	Credit
i	Principles of Prog. language DCS-301	Discrete Mathematics DCS-301	100	4	4	Programming in C lab DCS-304S	100	4	2
ii	Electronic Devices & circuits DETC-307	Digital Logic Design DETC-307	100	4	4	Electronics Devices & Circuit Lab DETC-304 S	100	4	2
iii	Computer Organization DCS-302		100	3	3	Digital Logic Design lab DETC-305S	100	4	2
iv	Data Structure & Algorithm DCS-303		100	3	3	Data Structure Lab DCS-305S	100	4	2
v						Business Application Lab DCS-306S	100	3	2
vi						PC Utility Lab DCS-307S	100	3	2
			400	14	14		600	22	12

CPW = Contact hour Per Week (for Theory, Tutorial, & Sessional/practical)

4th Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / Lab	Mark	CPW	Credit
i	Microprocessor DETC/HU-410	Numerical Method DETC/HU410	100	4	4	Communication Skill-II DHU-400S	100	3	2
ii	Data communication & Computer Network DCS-401		100	3	3	Network lab DCS-404S	100	3	2
iii	Object Oriented Programming Methodologies DCS-402		100	4	3	Object oriented Programming(C++) Lab DCS-405S	100	4	2
iv	Database Management System DCS-403		100	4	4	DBMS Lab DCS-405S	100	4	2
v						Multimedia Lab DCS-407S	100	4	2
Vi						Microprocessor Lab DETC-406 S	100	4	2
			400	14	14		600	22	12

Total Marks 1000 per semester , Number of Contact periods : 36 per week , Credit @ 26 per semester

Student should under go Industrial training for at least 2 week duration, corresponding grade for 2 credit (as received from industry) will be reflected on 5th semester grade card.

5th Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st Half (50mark)	2 nd Half (50 mark)	Mark	CPW	Credit	Name of Sessional / Lab	Mark	CPW	Credit
I	Industrial Management & DHU-501	Entrepreneurship Development DHU-501	100	4	4	Web Technology Lab DCS-504S	100	4	2
Ii	Theory of Computer Science & Automata DCS-501		100	3	3	JAVA Programming lab DCS-505S	100	5	2
Iii	Operating System DCS-502		100	4	4	Operating system Lab DCS-506S	100	4	2
Iv	Computer architecture DCS-503		100	3	3	Advanced DBMS Lab DCS-507S	100	4	2
V						Project – I DCS-508S	100	5	2
vi.						Industrial Training DIT-500S	100	-	2
			400	14	14		600	22	12

6th Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / practical	Mark	CPW	Credit
I	Professional Ethics & Values DHU-601	Optimization Technique DHU601	100	4	4	Internet Technology Lab DCS-604S	100	4	2
Ii	Software Engineering DCS-601		100	4	4	Advanced Java Lab DCS-605S	100	4	2
Iii	Internet Technology DCS-602		100	3	3	Project-II DCS-607S	200	8	4
Iv	Elective DCS-603 (. Opt. any one of the following) DCS-603/1 E-commerce DCS-603/2 Computer Graphics DCS-603/3 Mobile Computing DCS-603/4 Advance Java		100	3	3	PC Maintenance Lab DCS-606S	100	4	2
V						Generic Skill	50	2	1
Vi						Final Viva DCS-610S	50	-	1
	Total			14	14			22	12

Total marks : 1000 per semester , Number of Contact periods : 36 per week , Credit : @ 26 per semester

Details syllabi of 3rd semester Diploma CST

3rd Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / practical	Mark	CPW	Credit
i	Programming in C DCS-301	Discrete Mathematics DCS-301	100	4	4	Programming in C lab DCS-304S	100	4	2
ii	Electronic Devices & circuits DETC-307	Digital Logic Design DETC-307	100	4	4	Electronics Devices & Circuit Lab DETC-304 S	100	4	2
iii	Computer Organization DCS-302		100	3	3	Digital Logic Design lab DETC-305S	100	4	2
iv	Data Structure & Algorithm DCS-303		100	3	3	Data Structure Lab DCS-305S	100	4	2
v						Business Application Lab DCS-306S	100	3	2
vi						PC Utility Lab DCS-307S	100	3	2
			400	14	14		600	22	12

PROGRAMMING IN C

(DCS-301) 1st half

Total Marks : 50 , Credit : 2 , CPW :2

Detail course content

Module 1

INTRODUCTION TO PROGRAMMING

Concept of programming---different programming languages and programming logic—algorithms and flow charts overview of C programming

Introduction of C language- history of C-importance of C demerits of C- basic structure of C-working steps of C compiler-source code—object code—executable code, data types and sizes-declaration of variables—different operators and expressions type conversions.

Module 2

MANAGING INPUT AND OUTPUT OPERATIONS & CONTROL FLOW (DECISION MAKING)

Decision making and branching ,simple and nested IF statements,IF-ELSE statements CASE- SWITCH statements ,looping concept,GOTO statement,Looping: FOR,WHILE,and DO-WHILE statements, comparative study among them, BREAK and CONTINUE statements.

Module 3

Introduction to arrays, function, pointer, structure etc.

REFERENCE BOOKS

- 1.PROGRAMMING WITH C / BYRON GOTTERIED/TATA MCGRAW HILL
- 2.PROGRAMMING IN ANSI C /E.BALAGURUSWAMI/ TATAMCGRAW HILL
- LET US C /Y.KANETKAR/ BPB

DISCRETE MATHEMATICS (DCS-301) 2nd half

Total Marks : 50, cpw : 2, credit : 2

DETAIL COURSE CONTENT

SET THEORY :CONCEPT OF SETS: Notation – Subset – Superset – Empty set – Universal set – Examples — OPERATION ON SETS: Union – Intersection – Complementation – Difference – Symmetric difference – Problems relating simple set identities – Definition of power set – Cartesian product of finite number of sets – Simple problems – Cardinality of a set – Finite and infinite sets

RELATION BETWEEN TWO SETS: Binary relation as a subset of Cartesian product – Reflexive, symmetric & transitive relations – Examples — Equivalence relation – Examples

FUNCTIONS: Definition of function – Domain, Co-domain & Range of a function– Related problems.

RECURRENCE RELATION:

Definition – Examples (Fibonacci series etc.) – Linear recurrence relations with constants coefficients – Homogeneous solutions – Particular solutions – Total solutions – Problems

GRAPH THEORY : Introduction – Definition of a graph – Subgraph – Isomorphism – Walk, Paths and Circuits – Connectedness and components – Euler graphs

Graph theoretic algorithms – Minimal Spanning tree algorithm – Shorted path algorithm.

REFERENCE BOOKS

1. Foundation of Discrete Mathematics / K. D. Joshi
2. Discrete Mathematics with Algorithms / Albertson & Hutchinson / John Wiley
3. Discrete Mathematics / Iyenger, Venkatesh, Chandrasekaran & Arunachalam / Vikash Publishing House
4. Discrete Structure and Graph Theory / S.K.S. Rathore and H. Chaudhuri / Everest Publishing House

ELECTRONIC DEVICES & CIRCUITS (DETC- 307) 1st half

Total Marks :50 cpw: 2, credit : 2

DETAIL COURSE CONTENT

TRANSISTOR BIASING

Concept of Q-point – AC and DC load line – Stabilization and stability factor

TYPES OF BIASING: (a) Base Bias, (b) Collector Feedback Bias, (c) Emitter Feedback Bias, (d) Potential Divider Bias.

SMALL SIGNAL TRANSISTOR AMPLIFIER

Hybrid model and h-parameters of CB, CE & CC mode transistor amplifier – Calculation of voltage gain, current gain, power gain, input and output impedance for RC coupled amplifier .

Functional Characteristics and the operation of MOSFET and CMOS

RECTIFIER & Power Supply

Half-wave and full-wave rectifier, average voltage, rms voltage, efficiency and ripple factor, percentage voltage regulation

Function of filter circuits: Capacitor input filter, inductive filter, Π type filter

Series and shunt regulator using transistor, Concept of switch mode power supply, Block schematic description of uninterrupted power supply.

OPERATIONAL AMPLIFIER

Introduction to operational amplifier – Inverting and non inverting mode and their gain – Common mode rejection ratio etc., Applications of OPAMP

TIMER CIRCUITS

Principle of operation of electronic/ digital timer, Functional description of internal blocks of timer IC555

REFERENCE BOOKS

1. Electronic Principles / Malvino / Tata McGraw-Hill
2. Electronic Devices and Circuits / Boylestad & Nashalsky / Prentice Hall of India, N. Delhi
3. Electronic Devices and Circuits / S. Salivanan / Tata McGraw-Hill
4. Electronic Devices and Circuits / Mottershed / Prentice Hall of India, N. Delhi
5. Electronic Devices and Circuits / Millman & Halkias / Tata McGraw-Hill
6. Electronic Fundamentals and Applications / Chattopadhyay & Rakhshit / New Age International
7. Basic Electronic & Linear Circuits / Bhargava / Tata McGraw-Hill
8. Electronic Principle / Sahadeb / Dhanpat Rai & Sons

DIGITAL LOGIC DESIGN (DETC- 307) 2nd half

Total Marks :50 cpw: 2, credit : 2

DETAIL COURSE CONTENT

GROUP – A

NUMBER SYSTEMS & CODE

Simple arithmetic using positive and negative binary numbers: Addition, Subtraction, Different Weighted & Non-weighted codes — Error correcting codes etc.

BOOLEAN ALGEBRA & LOGIC GATES

Definition of Boolean Algebra — Boolean Theorems — Standard forms of expression & their conversion from one to another — LOGIC GATES: AND, OR, NOT, NAND, NOR, XOR, XNOR (truth table, logic expression, symbol) — Simple logic circuits using these gates

SIMPLIFICATION OF LOGIC EXPRESSIONS

Simplification of Boolean expression using — (i) Boolean Algebra; & (ii) Karnaugh Maps

GROUP – B

COMBINATIONAL LOGIC CIRCUITS

Arithmetic Circuits: Adder, Subtractor, Comparator, Multiplexer, Demultiplexer, Encoder & Decoder

SEQUENTIAL CIRCUITS

Introduction to sequential circuits — latch, flip flops, COUNTER, & Shift registers.

Application of Digital Ckt., D/A and A/D converter

REFERENCE BOOKS

1. Digital Logic & Computer Design / M. Morris Mano / Prentice Hall of India, N. Delhi
2. Digital Principles & Applications / Malvino & Leach / Tata McGraw-Hill
3. Modern Digital Electronics / R.P. Jain / Tata McGraw-Hill
4. Digital Logic Applications & Design / M. Yarbrough / Vikash Publishing House

COMPUTER ORGANISATION (DCS- 302)

Total Marks : 100 , CPW : 3, Credit : 3

DETAIL COURSE CONTENT

GROUP – A

(1ST HALF)

BASIC STRUCTURE OF COMPUTER

Stored program concept — Von Neumann architecture (definition only), Functional units, Bus structures,

NUMBER & ARITHMETIC

Fixed & Floating point numbers — Biased representation — NUMBER REPRESENTATION: Sign magnitude, 1's complement, 2's complement forms, various Arithmetic operation (with signed magnitude & floating point numbers)

MACHINE INSTRUCTION & PROGRAMS

Instruction format — Different types of instructions — ADDRESSING MODES: Implied, Immediate, Direct, Register, Register Indirect, Indirect, Indexed, Paged etc.,

PROCESSOR ORGANIZATION

Different CPU registers: Programmer accessible & non-accessible, Operational concept of computer (fetching & storing word & execution of a instruction), Multiple Bus organization,

GROUP – B (2ND HALF)

MEMORY ORGANIZATION

Concept of words — Memory size — Classification OF MEMORIES: Input processor memory, Main memory, Secondary memory, Cache memories, Virtual memories, architecture of ROM, Types of ROM, RAM (SRAM, DRAM) , Memory decoding, Floppy & Hard Disk (Sectors, Tracks, & Cylinders, Accessing mechanisms, Storage capacity), Magnetic tapes, CD-ROM — Memory hierarchy considering size, speed, cost.,

I/O DEVICES

Input Devices : Keyboard, Mouse, Trackball, Touch pad, Scanner,

Output Devices : Video Display, Flat panel Display, Printers

REFERENCE BOOKS

Computer Organization / Hamacher, Vranesic, Zaky / T.M.H

Computer Organization and Architecture / William Stallings / Prentice Hall of India, Delhi

Computer Fundamentals – Architecture and Organization / B Ram / Tata McGraw-Hill

Microprocessor / Ajit Pal / Tata McGraw-Hill

Computer System Architecture / V. K. Jain / S.K. Kataria & Sons

D A T A S T R U C T U R E & A L G O R I T H M(DCS-303)

Total Marks :100, CPW : 3L + 1T, Credit : 3

DETAIL COURSE CONTENT

GROUP – A (1ST HALF)

PROBLEM SOLVING & SOME CONCEPTS

Algorithms and flow charts, Time & Space complexity (DEFINATION ONLY)

PRIMITIVE & NON-PRIMITIVE LINEAR DATA STRUCTURE

PRIMITIVE DATA STRUCTURES: Integer (signed, unsigned, long, short) — Real (float, double, long double) — Character and Boolean data types — their declaration & space usage in computer memory.

NON-PRIMITIVE DATA STRUCTURES:

ARRAY: Definition — Declaration initialisation and usage of one and two-dimensional arrays — Numeric and character type arrays — Arrays as parameters

STRING: Definition — Declaration — String operations: String comparison, length of a string, concatenation of two strings, copy of a string, extract a portion of a string, reversing of a string.

STACK: Definition — Declaration — Operation — Stack implementation using array — Expression evaluation by stack (infix, prefix and postfix)

QUEUE: Definition — Declaration — Operation — Priority queue (definition and example)

LINKED LISTS: Concepts and representation of linked lists in memory — Array implementation of lists and its limitation — Concept of singly, doubly and circular linked lists & their applications (e.g., polynomial arithmetic)

RECURSION

Basic concepts and examples of recursion e.g. factorial problem, Fibonacci sequence.

GROUP - B (2ND HALF)

Non-Primitive Non-Linear Data Structures

TREE: Definition and application of tree — Binary tree: Definition and its Implementation, — Tree traversal (pre-order, post-order and in-order) —Balancing of a tree — AVL tree its definition, construction and rotation

Sorting & Searching

SORTING: Algorithms and their analysis (time and space) — Bubble sort, Selection Sort, Insertion Sort, Quick Sort, Merge Sort, Heap sort and Radix Sort

SEARCHING: Linear search — Binary search –Concept of Hashing.

REFERENCE BOOKS

Data Structures using C & C++ / Y. Langsam, M. J. Augenstein and A. M. Tenenbaum / PHI

Data Structures USING C / ISRD GROUP / Tata McGraw-Hill

Data Structures , Samanta : TMH

Sessional / Practical subjects for 3rd Semester

PROGRAMMING IN C LAB (ALL DISCIPLINE)

DCS-304S

TOTAL MARKS :100 CPW : 4(1 L + 3P) , CREDIT : 2

DETAIL COURSE CONTENT

Basic of C Programming

Introduction of C language , Merit & Demerits of C , Working steps of C Compiler

- 1.1 To execute a sample C program to study the basic structure of C program.
- 1.2 To be familiar with keywords and identifiers through some program.
- 1.3 To apply constant, variables and different types of data types.

Operators & Expressions

- 2.1 To write program using Arithmetic, Relational, Logical and Assignment operators.
- 2.2 To write program to implement increment & decrement operators and to find the greatest between two numbers using conditional operator.
- 2.3 To evaluate an expression to study operator precedence and associativity and to write a program using casting a value.

Decision Making

- 3.1 To use formatted scanf() and printf() functions for different types of data.
- 3.2 To find the roots of a quadratic equation. Find the greatest of three numbers using IF – ELSE and IF -ELSE IF statements.
- 3.3 To test whether the given character is vowel or not, using nested if –else statement and Switch-case statement.
- 3.4 To find sum of first n natural number using 'GOTO' statement
- 3.5 To find the sum of all Fibonacci numbers in between 1 to n using 'for' loop.
- 3.6 To find G.C.D and L.C.M of two numbers using 'WHILE' loop.
- 3.7 To find the sum of the digits of an integer using DO –WHILE loop structure.
- 3.8 To solve other problems for the implementation of different loop structure.

Arrays

- 4.1 To write a program to accept 10 numbers, store them in a single dimensional array and to make the average of the numbers.
- 4.2 To make an array of n elements and sort them and to write a program to check whether an input number is palindrome or not.
- 4.3 To write a program to accept a string and to count the no of vowels present in this string.
- 4.4 To write programs on matrix operation (addition, subtraction & multiplication).
- 4.5 To write some programs to utilize different string handling functions and to create an array to store the names of 10 students arranging them alphabetically.

User Defined Functions

- 5.1 To write a program to find the sum of the digits of a given number using function.
- 5.2 To write program using functions: —
 - (a) with no argument and no return value;
 - (b) with argument and no return value;
 - (c) with argument and return value.
- 5.3 To find out the factorial of a given number using recursive function.
- 5.4 To write a program that uses a function to sort an array of integers.
- 5.5 To write programs to illustrate auto variable, external variable, static variable and register variable.

Pointers

- 6.1 To write a program to access variables using pointer.
- 6.2 To write a program to assign the address of an integer array to a pointer variable 'p' and add all the array elements through 'p'.
- 6.3 To write programs to explain parameter passing 'by reference' and 'by value'.

Structure

- 7.1 To write a program to define and assign values to structure members
- 7.2 To write program to explain structure with arrays.
- 7.3 To define and assign values to 'Union' members.

File Handling

- 8.1 To write to and read from a sequential access file (use character type data).
 - 8.2 To create an integer data file, to read this file and to write all odd numbers to a new file.
 - 8.3 To write program to use different functions used in file handling.
 - 8.4 To make a random access to a file.
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ELECTRONICS DEVICE & CIRCUIT LAB

(DETC- 304 S) TOTAL MARKS :100 CPW : 4 , CREDIT : 2

DETAIL COURSE CONTENT

1. To study the VI characteristics of a reverse biased Zener diode.
2. To study the input and output characteristics and to find the h-parameters of a BJT for:
(a) C – E configuration; (b) C – C configuration; (c) C – B configuration.
3. To study the FET characteristics.
4. To study the rectifier with and without capacitor filter for:
(a) half-wave rectifier ;(b) full-wave rectifier; (c) bridge rectifier.
5. Determination of frequency response characteristics of RC coupled amplifier circuit & calculation of bandwidth, midband gain, input impedance and out put impedance for:
(a) single stage amplifier; (b) double stage amplifier.
6. To study the following applications of op-amp using IC741:
(a) adder; (b) subtractor; (c) differentiator (d) integrator; and, (e) voltage follower.
7. To study the characteristics of IC555 timer connected as: (a)astable multi-vibrator;
(b) monostable multi-vibrator.

DIGITAL LOGIC DESIGN LAB

(DETC- 305 S) Total marks : 100, Credit : 2 , CPW : 4

DETAIL COURSE CONTENT

(At least any ten experiments from the following)

1. To verify the truth tables for AND, OR, NOT, XOR, XNOR, NAND AND NOR gates.
2. To design Half adder and Full adder using all NAND gates or with all NOR gates.
3. To realize a truth table or a logic expression using the minimum number of logic gates.
4. To study 4-bit full adder IC chip (7483); Cascading of 7483.
5. To design 1's, 2's, 9's and 10's complement circuit using full adder.
6. To design BCD adder.
7. To design a simple multiplexer using discrete logic gates.
8. To use commercial multiplexer using IC chips for the design of combinational circuits.
9. To design simple decoder using discrete logic gates.
10. To use commercial multiplexer IC chips for the design of multi-output combinational circuit.
11. To design Gray-to-Binary and Binary-to-Gray code converter using discrete logic gates, multiplexers & decoders.
12. To design RS and D latch using all NAND gates or NOR gates.
13. To debounce mechanical switch using latch.
14. To design Master Slave JK flip-flop.
15. To design ripple counter.
16. To design synchronous counter.
17. To study some commercially available counter chips.
18. To design shift registers using flips-flops and to study its behaviour.
19. To study commercially available shift register IC chips.
20. To design astable and monostable multivibrator using 555 timer chip.
21. To study commercially available ADC and DAC chips.
22. To design ramp generator using DAC and counter.

DATA STRUCTURE LAB (DCS-305S)

Total Marks :100 , Credit : 2, CPW : 4

DETAIL COURSE CONTENT

ARRAY, STRING, STACK, QUEUE & POINTER RELATED PROBLEMS

One and two dimension ARRAY related problems.

Different STRING operations using different C library functions

Creation of STACK and its related problems such as expression conversion and evaluation.

QUEUE, its creation and related problems.

POINTER related problems.

STRUCTURE , UNION , LINKED LIST RELATED PROBLEMS

To create a heterogeneous data structure (using STRUCTURE) and then perform related problems.

Singly, Doubly and Circular LIST related problems.

RECURSION , SORTING , SEARCHING , TREE & FILE

To write a RECURSIVE function and change it to non-recursive way.

To write the following different SORTING programs in C: —

(a) Bubble sort, (b) Insertion sort, (c) Merge sort, (d) Quick sort, (e) Radix sort, and, (f) Heap sort.

To construct a binary TREE and traverse its different nodes.

Binary SEARCH related problems., FILE related problems.

REFERENCE BOOKS

1. Classic Data Structures / D. Samanta / PHI
2. Data Structures using C and C++ / Tanenbaum / PHI
3. Programming with C / R. K. Venugopal & Prasad / Tata McGraw-Hill

LIST OF SAMPLE PROBLEMS FOR DATA STRUCTURE LAB

1. To write a program to check whether a word is palindrome or not.
2. To create a two dimensional array of numbers and calculate & display the row & column sum and the grand total.
3. To write a program of matrix multiplication.
4. To write a program to insert (Push) an element into the sack and delete (Pop) an element from the stack using pointer.
5. To write a program to convert an infix expression to a postfix expression.
6. To evaluate a postfix expression.
7. To write a program to insert an element in the queue and delete an element from the queue using pointer.
8. To create a circular queue and add an element and delete an element from a circular queue.
9. To write a program of a structure containing an item name along with the unit price. The user enters the item name and quantity to be purchased. Program print outs total price of item with name using pointer in a structure or array in a structure.
10. To create a single linked list and — (a) insert a node in the list (before header node, in between two nodes, end of the list); (b) delete a node from the list (1st node, last node, in between two nodes); (c) Concatenate two lists.
11. To create a doubly linked list and — (a) insert a node in the list (before header node, in between two nodes, end of the list); (b) delete a node from the list (1st node, last node, in between two nodes); (c) Concatenate two lists.
12. To create a circular linked list and insert & delete an element from the list.
13. To write a program to calculate the binomial co-efficient of ${}^n C^r$ of two numbers using recursive function. Also write the same program using function in non-recursive way.

14. To write a program to generate Fibonacci Series using recursive function. Also write the same program using function in non-recursive way.
15. To write a program to sort a list of numbers using — (i) Heap Sort, (b) Quick Sort, (c) Bubble Sort.
16. To write a program to sort a list of numbers using — (i) Insertion Sort, (b) Merge Sort, (c) Radix Sort.
17. To write a program to create a binary tree and traverse it in pre-order and post-order form.
18. To write a program to create a binary search tree and — (a) insert a new node in the BST, (b) search a node in the BST, (c) delete a node from the BST.
19. To write a program to create a file, read the file, update the file, insert into the file, and, delete from the file. (The file contains, say for example, student first name, middle name, surname, address, phone no., roll no., branch etc.)

BUSINESS APPLICATION LAB

(using MS-Visual Basic)

DCS-306S, Total Marks : 100, credit : 2 , CPW : 3

DETAIL COURSE CONTENT

- Job 1** Start & Exit Visual Basic-Understanding Properties, Methods, Events-Visual Basic arithmetic operator.
- Job 2** Understanding Variable names – Variable types- Range of Variable values, Working with String function, Numerical function – Visual Basic Programming Fundamental.
- Job 3** Creating, Opening, Saving and Running VB Projects.
- Job 4** Working with Form & Form Events: Form properties – Working with following Form Tool (Tool box, Tool Bar, Menu Bar, Colour Palate)
- Job 5** Custom Control-Picture Box-Label Control –Text Box-Command Button-Shape-Frame-Check Box-Radio button-Combo Box-List Box etc.
- Job 6** Understanding Focus-Setting Tab Order.
- Job 7** Prompting user with Dialog Boxes.
- Job 8** Programming with various objects.
- Job 9** Working with Control array.
- Job 10** Working with MDI Form.

Reference book

1. Beginning Visual Basic 6 by : Peter Wright (SPD)

PC UTILITY LAB

DCS-307S, Total Marks : 100, credit : 2 , CPW : 3

DETAIL COURSE CONTENT

CREATION OF SPREADSHEET

To be able to create Mark sheets / Pay sheets / Monthly or Yearly expenditure sheets / any other worksheet using a spreadsheet package.

USE OF A DATABASE PACKAGE

To study a system related to the Institution / Country / Industry, and then, to create and manipulate data and generate report using a database package.

PREPARATION OF A PRESENTATION

To prepare a presentation about oneself / Institution / Country / any other topic.

Details syllabi of 4th semester

4th Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / Lab	Mark	CPW	Credit
i	Microprocessor DETC/HU-410	Numerical Method DETC/HU410	100	4	4	Communication Skill-II DHU-400S	100	3	2
ii	Data communication & Computer Network DCS-401		100	3	3	Network lab DCS-404S	100	3	2
iii	Object Oriented Programming Methodologies DCS-402		100	4	3	Object oriented Programming(C++) Lab DCS-405S	100	4	2
iv	Database Management System DCS-403		100	4	4	DBMS Lab DCS-406S	100	4	2
v						Multimedia Lab DCS-407S	100	4	2
Vi						Microprocessor Lab DETC-406 S	100	4	2
			400	14	14		600	22	12

M I C R O P R O C E S S O R (DETC/HU-410)

(1st half)

Total Marks : 50 , CPW : 2 Credit : 2

D E T A I L C O U R S E C O N T E N T

GROUP – A

INTRODUCTION TO MICROPROCESSORS

Evolution of microprocessors; Specific features of microprocessors, Application of microprocessors.

ARCHITECTURE OF MICROPROCESSORS

Explanation of each Functional Block Diagram and Internal Architecture of 8085, 8086 – ALU, Registers, Control unit, Clocks, Bus Structure; Address, Data and Control Bus of 8085, 8086; pin DIAGRAM of 8085, Introduction to PC range of Microprocessors & Case studies.

GROUP – B

PROGRAMMING OF MICROPROCESSORS

Different Addressing modes, Instruction Cycle of 8085 (including subroutine calls, jumping, comparing); Timing Diagram of different parts of Instruction Cycles; Solving basic problems of Assembly Language Programming using 8085.

MEMORY AND I/O

Address Space; Memory mapped I/O, I/O mapped I/O; address Decoding and Interfacing of Memory; DMA, Interrupts – Hardware and Software interrupts, A brief overview of BIOS Interrupts,

R E F E R E N C E B O O K S

1. Microprocessor Architecture, Programming and Applications – Ramesh S Goonkar.
2. Microprocessors and Interfacing – Douglas V Hall
3. Fundamentals of Microprocessors and Microcomputers – B Ram.
4. Advances Microprocessors and interfacing – B Ram.

NUMERICAL METHOD (DETC/HU- 410) (2nd half)

Total Marks : 50, credit :2, CPW: 2

DETAIL COURSE CONTENT

ERROR HANDLING

Approximation in Numerical Computation — Significant Figures — Absolute, Relative and Percentage Errors — Truncation and Round-off Errors — Accumulation and Propagation of Errors

POLYNOMIAL INTERPOLATION

Forward, Backward and Divided Difference Table — Newton's Forward and Backward Interpolation Formula — Newton's General Interpolation Formula with the remainder term — Lagrange's Interpolation Formula

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

Method of Tabulation — Bisection Method — Newton-Raphson Method

NUMERICAL DIFFERENTIATION AND INTEGRATION

Differentiation of Forward and Backward Formula — Trapezoidal rule — Simpson's 1/3 rule

SOLUTION OF ORDINARY DIFFERENTIAL EQUATION

Solution of first order Differential Equation by Euler's Method and Runge-Kutta Method.

REFERENCE BOOKS

1. Numerical Algorithms / E.V. Krishnamurthy & S.K. Sen
2. Numerical Mathematics Analysis / J. B. Scarborough / Oxford & IBH Publishing Co. Pvt. Ltd.
3. Introductory Numerical Analysis / Dutta & Jana / Sreedhar Prakashani, Kolkata
4. Numerical Methods / Balagurusamy / Tata McGraw-Hill
5. Introductory Methods of Numerical Analysis / S.S. Sastry / Prentice Hall of India, N. Delhi
6. Numerical Methods (Problems & Solutions) / Jain, Iyengar & Jain
7. Introduction to Numerical Analysis / C. Froberg / Addison Wesley

DATA COMMUNICATION & COMPUTER NETWORK (DCS-401)

Total Marks : 100, CPW : 3 , Credit :3

DETAIL COURSE CONTENT

GROUP - A (1st half)

Introduction to Computer Networks

BASIC CONCEPTS: Servers, Client, Workstation, Hosts (definition & applications)

TYPES OF COMPUTER NETWORKS: LAN, MAN and WAN., TYPES NETWORK ARCHITECTURE: Peer-to-peer, Client-Server, Distributed.

NETWORK TOPOLOGY (PHYSICAL & LOGICAL)

Bus, Ring, Star, Mesh and Tree.

TRANSMISSION MEDIA & SWITCHING

GUIDED: Coaxial, Twisted-pair (UTP, STP), fibre-optics cable.,UNGUIDED: Line of site transmission and communication satellites. SWITCHING: Circuit Switching, Packet Switching, Message Switching.

MODES OF DATA TRANSMISSION & MULTIPLEXING

Parallel and Serial, Asynchronous and Synchronous, Simplex, Half duplex and Full duplex
FDM, TDM.

GROUP - B (2nd half)

NETWORK REFERENCE MODEL, PROTOCOLS, SERVICES & STANDARDS

OSI reference model of Data Communication and its different layers.

Protocols, Services and Standards (in brief): TCP, FTP, TELNET, DNS, ICMP, IP (IP addressing, Subnet masking).

DEVICES OF NETWORK & INTER-NETWORK CONNECTIVITY

Repeater, Bridge, Router, Switches, Gateways, Modem.

FLOW CONTROL, ERROR CONTROL & NOISE

FLOW CONTROL: Stop-and-wait, Sliding window

ERROR CONTROL: Stop-and-wait ARQ, Sliding window ARQ.

NOISE: Definition and different types of Noise,.

REFERENCE BOOKS

1. Data Communications and Networking / B.A. Forouzan / Tata McGraw Hill
2. Data and Computer Communications / William Stallings / Prentice Hall of India
3. Data Networking Communication / M.A. Miller / Vikas Publishing House
4. Networking Protocols and Standards / Prentice Hall of India
5. Encyclopaedia of Networking / M. Tulloch / Prentice Hall of India
6. Basics of Network Security / Firewalls and VPNs / Prentice Hall of India
7. TCP/IP Protocol suite / B.A. Forouzan / Tata McGraw Hill
8. Data Communications / P.C. Gupta / Prentice Hall of India

OBJECT ORIENTED METHODOLOGIES (DCS-402)

Total Marks : 100 , CPW : 3 , Credit :3

Group- A

Introduction to OOP

(1st half)

OO Paradigm, Objects and Classes, Features Object oriented Programming, Structured Vs Object Oriented Development, Features of OO Languages, Applications of OOP, Merits and Limitations of OOP

Data types, Operators and I/O Operation

Basic Data types, Basic Type modifiers, Derived Data types, Variables, Storage class specifiers, Initializing variables, Operators, Unformatted Console and stream I/O Functions, Formatted Console I/O Functions

Classes and Objects

Classes ,Class Members and Creating Objects, Member functions, Member Access Specifiers (public, private, protected), Static class member, Inline Functions, Arrays within a Class and Array of Objects, Passing Objects as function arguments and returning object from a function

Constructors and Destructors

Constructors, Overloaded Constructors, Null Contradictor, Copy Constructor, Destructors Constraints on Constructors and Destructors

Overloading Functions and Operators

Overloading Functions, Overloading Operators (Unary, binary, string manipulation using operator)

Group –B

(2nd half)

Inheritance

Base and Derived classes, Accessing Base class members and Access Control, Overriding member functions, Multi Level, Multiple, Hierarchical& Hybrid Inheritance, Virtual Base Class

Polymorphism

Fundamental of Polymorphism, Pointer to object and derived class, 'This' pointer, Virtual Functions, Early and Late Binding, Rules of Virtual Functions, Pure Virtual Function, Friend Functions

File Handling

Basic File Operations, File Handling, Classes for file stream operation, Opening and Closing Files, File modes

Exception Handling & Templates

Introduction to Exception Handling, Catching Class Types, Multiple Catch Handlers, Exception Specification, Generic Functions/Function Templates, Template Arguments

Reference : 1. Object oriented programming in Turbo C++ , Robert Laffore
2. OOPs , Balaguruswamy, TMH

DATABASE MANAGEMENT SYSTEM

(DCS-403) Total Marks : 100, CPW : 4, Credit : 4

DETAIL COURSE CONTENT

Group- A

(1st half)

Basic Concepts of DBMS

Purpose of database systems – Data abstraction – Database Users – Data Independence (Logical & Physical) – Instance & Schemes – Three layered Architecture of DBMS – Different Levels of Abstraction.

DATA MODELLING, E-R MODELLING

LOGICAL MODELS: Object & Record based – Object oriented model – Entity relationship models – Entity sets & relationships sets – Attributes — KEYS in entity & relationship sets: (a) super key, (b) candidate key, (c) primary key, (d) unique key — Mapping constraints – E-R Diagrams – Relational Model – Hierarchical model – Network Model.

RELATIONAL DATABASE MANAGEMENT, RELATIONAL ALGEBRA & RELATIONAL CALCULUS

RDBMS Technology, The relational Data Structure, Keys, Relational Data Manipulation, The Relational Algebra, Relational algebraic Operations, The Set Operations, Fundamental Operations, Relational Calculus. Data definition language – Data manipulation language – Relational algebra — OPERATORS: select, project, join, rename etc – Simple examples.

GROUP - B

STRUCTURED QUERY LANGUAGE, QUERIES AND SUBQUERIES

Give elementary idea of Structured Query Language – SQL Commands – SQL Data Types and Literals – SQL Operators, Basic Queries in SQL – Aggregate Functions – Grouping Selecting – Joins – Set Operations – SubQueries – Join Vs SubQueries.

(2nd half)

DML AND DDL COMMANDS, PL/SQL PROGRAMMING

Data manipulation Language Commands - Data Definition Language Commands – Tables - Views.PL/SQL Introduction – Block Structure, Variables – PL/SQL control Structures, Cursors, Error Handling, Triggers – ODBC Concepts (or Any API).

GROUP - C

NORMALIZATION IN RELATION SYSTEM

Pitfalls in relation databases – Functional Dependencies – Lossless join and Dependency Preservation –Importance of normalization – 1st NF, 2nd NF, 3rd NF and comparison with each other – BCNF – Multi-valued Dependency & 4th NF (Elementary idea).

TRANSACTION PROCESSING CONCEPTS, CONCURRENCY CONTROL CONCEPTS

Transaction processing – Transaction & System Concepts – Desirable properties of transaction - Basic concepts of concurrency control – Concepts of locks – Live Lock – Deadlock

SECURITY & INTEGRITY

Authorization and View – Security constraints – Integrity Constraints – Encryption (only Fundamentals).

Reference Books: 1. DBMS, Korth 2. DBMs, Navathe

Sessional / Practical subjects for 4th Semester

COMMUNICATION SKILL-II (DHU 400S)

1st half (For all Discipline)

Total Marks : 100, CPW :3 , Credit : 2

DETAIL COURSE CONTENT

LOOKING FOR A JOB

Identifying Sources — Skimming Newspapers for Information

JOB INTERVIEWS *

Preparing for an interview — Responding Appropriately — Group Discussions — Using Language Effectively for Interaction

* Mock interviews are to be arranged and to be conducted by any suitable person

AT THE WORKPLACE

Preparations of CV, performance testing on the skill of writing business and official letters, memos and tenders etc., presentation skill, preparations of instruction manuals, maintenance of office files and correspondences etc.

TEXT BOOK AND OTHER RECOMMENDED BOOKS

ENGLISH SKILLS for Technical Students – TEACHERS' HANDBOOK / West Bengal State Council of Technical Education in collaboration with THE BRITISH COUNCIL / Orient Longman – Business Correspondence and Report Writing, by Krishna Mohan & C. Sharma – Business Correspondence, by V.G. Natu and C Kaur – Professional Communication Skills, by Pravin Bhatia and A.M. Shaikh – A Guide to Business Correspondence and Communication Skills, by A.N. Kapoor – English Grammar, by Wren & Martin.

M I C R O P R O C E S S O R L A B (DETC- 406S)

Total Marks : 100, CPW : 4, Credit : 2

DETAIL COURSE CONTENT

- Job 1** To be acquainted with the Microprocessor Trainer Kit; Hardware and User's commands. 5
- Job 2** Assembly language program development ; Data transfer program – Register to Register, Register to Memory ;and vice-versa: Arithmetic operation-8 bit addition and subtraction, multi-byte addition and subtraction, BCD addition and subtraction, multiplication using repeated additions, multiplication using shift-add process, signed multiplication, Binary division, BCD division.
- Job 3** Sorting and searching; block movement; ordering of a collection of data.
- Job 4** Look-up table – finding squares, cubes etc. of a number using look-up table; code conversion using look-up table.
- Job 5** To develop the above program using a subroutine in a main program, delay routine.
- Job 6** Input / Output programming 8255 with the basic I/O modes programming; to store the sample data of any analog signal using ADC and 7-segmen display using 8255 as a port; to design a thermometer using AD590, 0808, seven segment display, 8279 (micro-processor kit).
- Job 7** Programming in 8086 using Debug programme: (i) Block move, Searching, Sorting; (ii) Port I/O (LPT1); (iii) Disk file accessing; (iv) Graphics text mode and Graphics mode. 10

NETWORKING LAB (DCS-404S)

Total Marks : 100, CPW :3 4, Credit : 2

DETAIL COURSE CONTENT

Job 1. To be familiar with different network cables (UTP, STP, Coaxial), Connectors (BNC, BNC-T, RJ-11 (4 wire) RJ-45 (8 wire), DB9, DB15) and Terminator.

Job 2 To study crimping: RJ-45, RJ-11, Cross-over Cable.

Job 3 To study the different expansion slots of a motherboard, set the NIC to expansion slot and to install the driver.

Job 4 To connect HUB with other nodes and HUB-to-HUB.

Job 5 To make a peer-to-peer Network System.

Job 6 To run the following application in a network system and get knowledge: (i) FTP, (ii) Telnet, (iii) Mail, and, (iv) Talk.

Job 7 To use the ping utility in order to understand its use in a trouble shooting environment.

Job 8 To be familiar with loop back testing.

Job 9 To be familiar with the idea of socket and to write a socket program.

REFERENCE BOOKS

1. Hands on networking essentials with projects / M.J. Palmer
2. Internet working with TCP-IP / D.E. Comer and D. Stevens / Prentice Hall of India
3. CISCO Internet working / Charles Riley / SPD Pvt. Ltd.
4. Networking Cabling handbook / Chris Clark / Tata McGraw Hill
5. Designing and implementing local and WANs / M.J. Palmer and R.B. Sinclair / Vikas Publishing House.

OBJECT ORIENTED PROGRAMMING LAB

(DCS- 405S) Total Marks : 100, CPW : 4 Credit : 2

DETAIL COURSE CONTENT

PROGRAMMING WITH C++

Classes – objects – Declaring & Creating Objects – Concept of members variable, methods – Private, Public, protected variable.

1. Constructors: Constructor with parameter – Constructor without parameter – Copy Constructor.
2. Destructor.
3. Passing objects to method.
4. Inheritance: Private, Public, protected inheritance – Single, Multiple inheritance – Multilevel, hierarchical inheritance.
5. Operator overloading & polymorphism: Unary operator overloading like ++, - - etc. – Binary operator overloading like arithmetic operator – Comparison operator, Assignment operator etc. – Introductory problem on virtual function & friend function.
6. Class Templates and Exception handling.

REFERENCE BOOKS

2. Objected Oriented Programming with C++, By – E Balaguruswami (TMH)
3. Object Oriented Programming in Microsoft C++, By- Robart Lafore.
4. Let Us C++, By- Y Kanethkar.

DATABASE MANAGEMENT SYSTEMS LAB

(DCS-406S), Total Marks : 100, CPW : 4, Credit : 2

DETAIL COURSE CONTENT

INTRODUCTION TO ORACLE OR MS-SQL SERVER

Introduction to oracle — Various Data types — Creating Tables, Modifying structure of tables — Inserting, Updating, Deleting table data — Many faces of SELECT command — Data Constraints — Logical operators, Range Searching , Pattern Matching, Oracle Function — Grouping data from tables — Views — JOINS: Equi-Join, Self-Join.

UNDERSTANDING PL / SQL

Introduction to PL/SQL — PL/SQL Syntax and PL/SQL execution environment — Variables and Various Data types — Understanding PL/SQL block structure — ERROR HANDLING IN PL/SQL: (a) user defined error condition, and, (b) pre-defined internal PL/SQL exception — Introduction to cursor — CURSOR CONTROL: open, fetch, close statements — Implicit & Explicit cursor and their attributes.

WORKING WITH FORMS

Basic Components of Form — Understanding Block, Item, Frame, Canvas View, Window, PL/SQL Code — Form construction, Default Form, Customizing Form layout — Standard data retrieval and data manipulation operation using form — Understanding and using Triggers and user-defined procedure — Form data validation — Context sensitive help — Constructing master-detail form — Using LOV and list items — Working with Multiple Canvases — Passing parameter between forms.

WORKING WITH MENU

Components of custom menu — Creating custom menu & menu module — Attaching PL / SQL code to menu items — Saving & Compiling a menu module — Attaching menu module to form module.

WORKING WITH REPORT

Basic Concepts — Using Oracle report interface — Creating default tabular report — Customizing report layout — Familiarity with Break & Matrix report.

REFERENCE BOOKS : ORACLE DEVELOPER 2000 / Ivan Bayross.

MULTIMEDIA LAB

(DCS-407S), TOTAL MARKS : 100, CREDIT : 2 CPW : 4

ADOBE PHOTOSHOP

Scanning image., Creating new images., Changing background and foreground colours.
Creating and using paths., Editing and retouching., Duplicating images.
Layers – linking with layers., Grouping images., Rubber stamp and pattern stamp tool.
Painting – Paintbrush tool, pencil tool, eraser tool, gradient tool.

Flash 5

Flash editor, creating simple graphics, modifying simple graphics, complex graphics on single layer/multiple layers, reusing graphics objects, frame by frame animation, animation with motion tweening, animation with shape tweening, interactivity with simple frame actions, interactivity with objects, adding sound to your movies, delivering movies to your audience.

REFERENCE BOOKS

1. Multimedia: Production, Planning and Delivery by John Villamil-Casanova and Louis Molina, PHI
2. Multimedia: Sound and Video by Jose Lozano, PHI
3. Multimedia Graphics by Leony Fernandez – Elias and John Villamil-Casanova, PHI
4. Multimedia on the Web by Stephen McGloughlin, PHI

Details syllabi of 5th semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st Half (50mark)	2 nd Half (50 mark)	Mark	CPW	Credit	Name of Sessional / Lab	Mark	CPW	Credit
i	Industrial Management & DHU-501	Entrepreneurship Development DHU-501	100	4	4	Web Technology Lab DCS-504S	100	4	2
ii	Theory of Computer Science & Automata DCS-501		100	3	3	JAVA Programming lab DCS-505S	100	5	2
iii	Operating System DCS-502		100	4	4	Operating system Lab DCS-506S	100	4	2
iv	Computer architecture DCS-503		100	3	3	Advanced DBMS Lab DCS-507S	100	4	2
v						Project – I DCS-508S	100	5	2
vi.						Industrial Training DIT-500S	100	-	2
			400	14	14		600	22	12

INDUSTRIAL MANAGEMENT
(DHU 501) 1ST HALF , Full Marks: 50, Credit : 2, CPW: 2

Introduction to Management Science

Principles & functions of management — Contributions of F.W. Taylor, Henry Fayol, Max Weber in development of the theories of management science.

Organisational Behaviour

Objectives — Brief introduction to: Motivation– Perception – Leadership & Leadership Styles – Communication – Team Building – Work Culture.

Human Resources Management

Scope & Functions – Human Resources Planning – Selection & Recruitment – Training & Development – Performance Appraisal .

Production & material Management

Production Planning: Routing – Loading – Scheduling — Production Control: Expediting – Dispatching — Materials Handling Inventory Management Inventory Management — Productivity — Quality Management: Tools & Techniques – Quality Management System.:

Financial Management

Financial Ratios — Elements of Costing — Auditing

Marketing & Sales Management

Marketing of products & Services — Advertising & Sales Promotion — Consumer Behaviour

REFERENCE BOOKS

Essentials of Management / Kontz / McGraw-Hill of India

Organization & Behaviour / M. Banerjee / Allied Publishers

Human Behaviour at Work: Organizational Behaviour / Keith Davis & Newstrom / McGraw-Hill of India

Human Resources Management / Mirza Saiyatain / Tata McGraw-Hill

Production Management & Control / Nikhil Bharat / U.N. Dhar & Co.

Production Management / Keith Lockyer / ELBS

Marketing Management / Philip Kotler / Prentice Hall of India

Lectures on Management Accounting / Dr. B.K. Basu / Basusri Bookstall, Kolkata

An Insight into Auditing: A Multi-dimensional Approach / Dr. B.K. Basu / Basusri Bookstall, Kolkata

Business Strategies, Financial Management & Management Accounting / S.K. Poddar / The Association of Engineers (India)

ENTREPRENEURSHIP DEVELOPMENT
(DHU 501) , 2ND HALF , Full Marks: 50, Credit : 2, CPW: 2

DETAIL COURSE CONTENT

Entrepreneurial Development

Definition of entrepreneurship, Characteristics of entrepreneurship, Factors influencing entrepreneurship, Types and Functions of Entrepreneurs.

Need for promotion of entrepreneurship, Entrepreneurial Environment, Govt. policies for setting-up new small enterprises.

Planning a SSI

What is planning, Types of planning, Importance of planning, Steps in planning.,Steps for starting a small enterprise. ,Commercial Banks and Financial Institutions.

Problems of Small Industries

Power shortages, Project planning, Finance.,Raw materials, Production constraints, Marketing. ,Personal constraints, Regulation., Entrepreneurial Motivation Training, Motivating factors of Entrepreneurs, Achievement Motivation, Institutions assisting entrepreneurs.

REFERENCE BOOKS

Starting your own business, A step-by-step Blue print for the first-time Entrepreneur – Stephen C. Harper, McGraw-Hill

Harward Business Review on Entrepreneurship – Harward Business School Press.

Entrepreneurship Development in small scale – proceedings of National Seminar, DCSSI, New Delhi – Patel, V.G.

Entrepreneurship: Strategies & Resources – Abrams Grant Pass. Oregon: Oasis press.

The Business Planning Guide – David H Bangs, Upstart Publishing Company in Chicago.

Entrepreneurship Development in India – Dr. C.B. Gupta, Dr. N.P. Srinivasan, Sultan Chand & Sons.

Entrepreneurship – Madhurima Lall and Shikha Sahai, Excel Books.

THEORY OF COMPUTER SCIENCE & AUTOMATA (DCS-501)

Total Marks: 100, Cpw: 3, credit: 3

DETAIL COURSE CONTENT

GROUP - A (1st half)

Mathematical Preliminaries :Sets, Relations and Functions (Brief Discussion), Graphs, Trees. ,Strings and their properties: Definition, operation on strings, palindrome, prefix & suffix of a string, Levi theorem (Statement only), Terminal & Non-terminal symbols.
The Theory of Automata

Definition of an Automaton, Definition of finite Automaton, Block diagram of finite Automaton, Transition system, Properties of Transition Functions, Acceptability of a string by Finite Automaton. Definition of DFA and N DFA, The equivalence of DFA and N DFA. Mealy and Moore machine.

Formal Language

Concept of a language, Definition of a grammar, Language generated by a grammar (definition with application). Chomsky classification of languages (definition), Relation between the classified languages. Recursive and recursively enumerable set (definitions).

GROUP - B (2nd half)

Regular Sets & Regular Grammar

Definition of Regular expression and regular set, Identities of regular expressions
Relation between regular expression and finite automata, Transition system containing \wedge -moves (application), Conversion of Non-deterministic systems to deterministic system (application), Construction of finite automata equivalent to a regular expression (with application)

Context-Free LANGUAGES & Pushdown Automata

Introduction – Definition – Derivation trees (Definitions & application) – Ambiguity in CFG, Basic definition of PDA

REFERENCE Books

Introduction to Automata Theory, languages & computation / J.E. Hopcroft & J.D. Ulman / Narosa

Theory of Computer Science / K.L.P. Mishra & N. Chandrasekharan / PHI

Theory of Automata and Formal Language / Kain / TMH

Switching and Finite Automata / Z.V.I. Kohavi / TMH.

OPERATING SYSTEM (DCS-502)

Total Marks: 100, Cpw: 4, credit: 4

DETAIL COURSE CONTENT

GROUP – A (1st half)

Introduction :An Introduction to Operating System & its Services, Various Types of Operating Systems, Operating System Structure, Concepts of: Process – Files – System Calls – Interrupt – Shell

Process Management

An Introduction to process; Process State & Transition, Process Control Block, Process Context, Context Switch,

Process Scheduling (Pre-emptive & Non-Pre-emptive Algorithms), FCFS (First Come First Served) Algo; Shortest Job First; Priority Scheduling; Round Robin Scheduling. Performance Criteria of Scheduling Algorithm :CPU Utilization; Throughput; Turnaround Time; Waiting Time; Response Time.

Overview of: Inter-process Communication – Race Condition – Critical Section – Semaphore

Group-B (2nd half)

Memory Management

Partitioned Memory Management (Static & Dynamic), Concept of Fragmentation & Compaction, Paging & Demand Paging ,Page Replacement Algorithms (FIFO, Optimal, LRU Algorithms)

Deadlock :Introduction to Deadlock ,Necessary Condition for Deadlock ,Method for Handling Deadlock, Brief Overview of Deadlock Prevention; Deadlock Avoidance (Banker's Algorithm); Deadlock Detection & Recovery.

File Management

File Concepts – Types of Files – File Attributes – File Operations
Access Methods: Sequential access – Random access ,Hierarchical Directory System

REFERENCE BOOKS

Operating System Design & Implementation / Andres's Tanenbaum / Prentice Hall of India, N. Delhi

Operating Systems / Stuart E Mandnick & John J Donovan / McGraw-Hill

COMPUTER ARCHITECTURE (DCS-503)

Total Marks: 100, Cpw: 3, credit: 3

Group-A

(1st half)

INTRODUCTION

ARITHMETIC WITH SIGNED MAGNITUDE DATA: Addition, Subtraction, Multiplication, Division.

HARDWARE IMPLEMENTATION AND ALGORITHM: Addition, Subtraction, Multiplication, Division.

FLOATING POINT ARITHMETIC OPERATION: Basic consideration, Register Configuration, Addition, Subtraction, Multiplication and Division.

CONTROL UNIT

Hardware Control with an example.

Micro programmed Control-Control Memory, Computer Configuration

CENTRAL PROCESSING UNIT

STACK ORGANIZATION: Register Stack, Memory Stack, Revised Polish Notation, Evaluation of Arithmetic Expression; Introduction to Register Transfer Language(RTL)

INTERRUPTS: S/W and H/W Interrupts, Vectored and Non-Vectored Interrupts, Priority Interrupts, Interrupts Handling, RISC and CISC Architecture.

GROUP – B

(2ND HALF)

PIPELINE & VECTOR PROCESSING

Parallel Processing, Pipelining : General consideration, Arithmetic Pipeline,

Instruction Pipeline (with example), RISC Pipeline (with example), Vector Processing: Vector operation, Matrix multiplication, Memory interleaving.

Array Processor : SIMD Array processor, Problems

INPUT OUTPUT ORGANIZATION

I/O INTERFACE: I/O Bus and Interface Modules, I/O versus Memory Bus, Isolated versus Memory-Mapped I/O, Example of I/O Interface.

INPUT-OUTPUT PROCESSOR: CPU-IOP Communication.

MEMORY ORGANIZATION

CACHE MEMORY: Associative mapping, Direct mapping, Set-associative mapping, Writing into Cache, Cache Initialization, Cache level 1, level 2.

VIRTUAL MEMORY: Address space and Memory space; Address mapping using Pages, Associative memory page table, Page replacement.

REFERENCE BOOKS

1. Computer System Architecture / M. Morris Mano / Pearson Education.
2. Advance Computer Architecture , K.Hwang, PHI

Sessional / Practical subjects for 5th Semester

WEB TECHNOLOGY LAB (DCS-504S)

Total Marks: 100, Cpw: 4, credit: 2

Html Basics : To create an HTML document with the main structure elements (HTML, HEAD, BODY), save it and display it on a browser.

To create an HTML document and add the following: (a) Comments, (b) Headings (H1 to H6), (c) Paragraph, (d) Visual line break.

b. Fonts ,Colour ,Lists & Tables :To create an HTML document and add the following: (a) Fonts, (b) Colours, (c) Lists, (d) Signature Text blocks.

To create in an HTML document a Table and mention the following: (a) Table variables, (b) Table element, (c) CAPTION element, (d) Table ROW element, (e) Table Data element, (f) Table Heading element.

c. Hyper Links ,Frames & Images : To create a web page using HTML and clarify the following: (a) how to create hyperlink, (b) how to create frames, (c) how to Insert an image.

HTML / Applet : Creating simple HTML file, place it in web server and access it from client Browser.Creating a HTML form incorporating GUI components (Command button, text box, radio button, check box, combo box etc).

Creating a simple applet and embedding it in HTML file. Writing applet to in corporate GUI components (Command button, text box, radio button, check box, combo box etc).

Writing applet to incorporate events.

Active Server Pages Introduction to Active Server Pages.

Elements of ASP (Scripts, Objects, Components). Making your first Active Server Page.

Working with ASP: Using HTTP — Writing simple ASP files — Controlling Execution of server side scripts — Problems on HTML forms to get user information and retrieving HTML form contents — Working with query string.

ASP Session: Introduction to session — Familiarity and working with session objects (simple problems) — Using session events — Familiarity and working with cookies.

ASP Application: Introduction to ASP Application features of ASP Application — Creating a Simple ASP Application, Setting the properties of ASP Application — Using Application objects and Application events.

ASP Components: Using Components in ASP (Simple problems) — Creating Components with page scope, session scope, Application scope — Working with browser capability component, file assess components , counter components etc.(Simple problems)

Reference Books :

HTML: The Complete Reference / Thomas A. Powell / Tata Mc-Graw Hill Pub. Co. Ltd.

HTML and XML an Introduction / Prentice Hall of India Pvt. Ltd.

Internet: An Introduction / Tata Mc-Graw Hill Pub. Co. Ltd

JAVA PROGRAMMING LAB (DCS-505S)

Total Marks: 100, Cpw: 5, credit: 2

DETAIL COURSE CONTENT

J A V A

Java Programming Fundamentals

To write a Java application program which clarify the following points:

How to compile and run,

How to set path and classpath,

Single and Multi-line comments, and,

Command line arguments.

Data Types, Variables Operators & Arrays

To write a Java program which defines and initialized different data types: byte, short, int, long, float & double and clarify the following points: (a) dynamic initialization, (b) type conversion and casting.

Problems related to Character and Boolean data type.

Problems related to one and two dimensional array.

Problems related to Arithmetic, bit wise and relational operators.

Control Statements & Looping Structure

Problems related to: IF-ELSE, IF-ELSE-IF, SWITCH statements.

Problems related to the following looping statements — WHILE, DO-WHILE & FOR.

Problems related to nested looping and jump statements (BREAK, CONTINUE & RETURN)

Classes ,Objects & Methods

To write a Java program to clarify the following points: (a) how to declare a class, (b) how to create an object, (c) how methods are defining in a class, (d) access variables and methods.

To construct a Java program which defines: (a) how arguments values are passed to a method, (b) use of new operator, constructor and finalize) method, (c) passing objects to a method, (d) declaration of static keyword.

To practice problems related to: (a) Method overloading, (b) Multiple constructor, (c) Calling constructor from a constructor.

Exception Handling

To write a Java program which is constructed using TRY, CATCH and FINALLY blocks

Inheritance & Extending Classes (Interface)

To write Java programs which clarify the following: (a) super class, (b) sub-class / derive class, (c) understanding abstract and final class, (d) polymorphism.

To practice problems related to: (a) Multiple Inheritance, (b) Interface, (c) Extending Interfaces. Thread & Multi-Thread

To practice problems related to main thread, sub-threads and thread priorities.

Java Networking

To write a Java program which displays the: (a) IP address of a corresponding host name, (b) Different parts of an URL (e.g. Protocol; Port no, hostname, Filename).

To practice problems related to Socket programming (minimum two problems).

Data Base Connectivity : JDBC

6

To practice problems related to data base connection using JDBC: ODBC bridging driver.

To write a Java program which connects to the data base (Access / Oracle) and displays the output.

REFERENCE BOOKS

JAVA 2: The Complete Reference / Herbert Schildt / Tata Mc-Graw Hill Pub. Co. Ltd.

Head First Java / K. Sierra & B. Bates , O'Reilly

Internet and Java Programming / R. Krishnamoorthy & S. Prabhu / New Age International (p) Ltd.

Beginning Java 2 / Ivor Horton / Wrox Press Ltd (SPD)

Beginning Java Networking / C. Darby, J. Griffin and others / Wrox Press Ltd. (SPD)

Teach yourself Web Technologies Part – I / Ivan Bayross / BPB Publications

Teach yourself Web Technologies Part – II / Ivan Bayross / BPB Publications

Java foundations of programming / Prentice Hall of India Pvt. Ltd.

OPERATING SYSTEM LAB (DCS-506S)

Total Marks: 100, Cpw: 4, credit: 2

DETAIL COURSE CONTENT

GROUP – A WINDOWS – 2003 Adv. Server

Overview Of Windows – 2003

2003 Features, 2003 Capabilities - Multitasking, Multithreading, Multiprocessor Support. 2003 File System, Client/Server Model.

Windows 2003 Basics :Starting & Quitting Windows 2003

Viewing Contents Of Your System, Opening, Closing, Switching Between Programs

Organizing Files & Folders, Installing Software Programs.

Windows Installation

2000/2003 Hardware Requirements.

2000/ 2003 Server Installation & Configuration.

2000/2003 Workstation Installation & Configuration.

2000/2003 Administration

Creating a New User , Adding an Account to a Group, Creating permission for a system resources.Using Task Manager. Compressing & Uncompressing Disk.

Using Event Viewer: (a) application log, (b) security log. Using Performance Monitor.

GROUP – B UNIX / LINUX

Overview of Unix

UNIX as an operating system – Kernel – Shell – User – UNIX File System – Files & Directory – File System Hierarchy.

Basic UNIX Commands , Listing Files & Directories. Copying, Deleting, Renaming, Comparing, Splitting, Linking Files., Creating, Navigating, Removing Directories.

Setting Access permission of files & directories.

Using VI editor of UNIX. Paging & Printing Files., Status of users terminals & setting terminal Characteristics., Cutting, Pasting, Sorting of Files., Searching for a pattern in string. Process Status, Process Killing

System Administration

Adding & Modifying Users accounts, Controlling Password. Creating & Mounting File System., init process & inittab startup files, Run levels., Managing Disk Space(df , du , cpio) Searching Files with find command, Using ftp protocol to move files between computers. 'Shutdown' command.

Shell Programming

Shell Script, System variables & shell variables. Shell termination.

Looping statements; conditional statements; case statements. Logical operators, Mathematical expression., Command line parameters – Positional parameters. String handling.

ADVANCED DATABASE MANAGEMENT SYSTEMS LAB (DCS-507S)

Total Marks: 100, Cpw: 4, credit: 2

DETAIL COURSE CONTENT

Working with Procedure: Introduction to procedure. Creating stored procedures using SQL*Plus, Procedure Builder., Concept of parameters., Methods for passing parameters. Server-side procedure, Client-side procedure.

Working with Functions : Introduction to function and stored function. Creation of functions and stored functions., Calling a function., Comparing procedures and functions. Benefits of stored procedure and functions.

Working with Database Triggers :Concept of triggers. Designing triggers. Components of a trigger. Creation of triggers. Firing sequence of database triggers, Implementation of triggers. Benefits of database triggers.

Working with Forms (Advanced) : Introduction of Multiple form application. Trigger and its components. Defining triggers. Using and debugging of triggers. Query triggers. Form triggers. Validation using triggers. Navigation triggers. Transaction processing and its characteristics.

Working with Report (Advanced) Creating report using wizard., Creating queries and groups, Creating and using report parameters ,Triggers in report

REFERENCE BOOKS

ORACLE DEVELOPER 2000 / Ivan Bayross.

PROJECT –I (DCS-508)

Total Marks : 100, CPW : 5, Credit :2

GENERAL GUIDELINE

Project Work is conceived as a group work through which the spirit of team building is expected to be developed. Students will be required to carry out their Project Works in groups under supervision of a lecturer of their core discipline who will work as a Project Guide. It is expected that most of the lecturers of the core discipline will act as project guide and each should supervise the work of at least two groups. Number of students per group will vary with the number of lecturers acting as Project Guide and student strength of that particular class.

COURSE SCHEDULE THE PROJECT

Each group will take at least one project in the entire session. The following subject areas may be selected for project work. The selected topic, however, need not be limited to those areas only:—

Database Management System,
Operation Research,
Microprocessor interfacing,
Object Oriented Programming,
Graphics Users Interface,
Computer Graphics,
Web based application, and,

a particular project may be part of a bigger project depending upon the complexity.

The Project Report must include the following sections:—

Introduction – Problem definition – Scope and Objective of the problem,
System Environment,
System Analysis and Requirement Analysis,
System Design and Implementation,
System Testing, and,

INDUSTRIAL TRAINING

DIT-500S, Total Marks : 100, credit : 2

All the students must undergo at least 2 weeks Industrial training to local / outside company /organisation after completion of 4th semester examination .

A feedback form will be taken from the respective industry which will indicate the students performance during the training and same will be reflected on the grade card of 5th semester.

COURSE OFFERED IN 6TH SEMESTER

6th Semester

Sl. No	Theoretical Paper					Sessional / Practical paper			
	1 st half (50mark)	2 nd half (50 mark)	Mark	CPW	Credit	Name of Sessional / practical	Mark	CPW	Credit
I	Professional Ethics & Values DHU-601	Optimization Technique DHU601	100	4	4	Internet Technology Lab DCS-604S	100	4	2
Ii	Software Engineering DCS-601		100	4	4	Advanced Java Lab DCS-605S	100	4	2
Iii	Internet Technology DCS-602		100	3	3	Project-II DCS-607S	200	8	4
Iv	Elective DCS-603 (. Opt. any one of the following) DCS-603/1 E-commerce DCS-603/2 Computer Graphics DCS-603/3 Mobile Computing DCS-603/4 Advance Java		100	3	3	PC Maintenance Lab DCS-606S	100	4	2
V						Generic Skill	50	2	1
Vi						Final Viva DCS-610S	50	-	1
	Total			14	14			22	12

PROFESSIONAL ETHICS & VALUES (DHU-601) 1st half

Total Marks: 50, Credit: 2 , CPW : 2

DETAIL COURSE CONTENT

Effects of Technological Growth:

Rapid Technological growth and depletion of resources. Reports of the Club of Rome. Limits to growth; sustainable development. Energy Crisis; Renewable Energy Resources. Environmental degradation and pollution. Eco-friendly Technologies. Environmental Regulations. Environmental Ethics. Appropriate Technology Movement of Schumacher: later developments. Technology and developing nations. Problems of Technology transfer. Technology assessment/ impact analysis; Industrial hazards and safety, safety regulations safety engineering. Politics and technology, authorization versus democratic control of technology; Human Operator in Engineering projects and industries. Problems of man machine interaction. Impact of assembly line and automation. Human centered Technology

Ethics of Profession:

Engineering profession: Ethical issues in engineering practice. Conflicts between business demands and professional ideals. Social and ethical Responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond. Case studies.

Profession and Human Values :

Value Crisis in contemporary society. Nature of values: Value Spectrum of a 'good' life
Psychological values: Integrated personality; mental health. Societal values: The modern search for a 'good' society, justice, democracy, secularism, rule of law; values in Indian Constitution. Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity

Moral and ethical values: Nature of moral judgments; canons of ethics; Ethics of virtue; ethics of duty; ethics of responsibility. Work ethics, professional ethics.

REFERENCE BOOKS:

1. Blending the best of the East & West, Dr. Subir Chowdhury, EXCEL
2. Ethics & Mgmt. & Indian Ethos, Ghosh, VIKAS
3. Business Ethics, Pherwani, EPH
4. Ethics, Indian Ethos & Mgmt., Balachandran, Raja, Nair, Shroff Publishers
5. Business Ethics: concept and cases, Velasquez, Pearson

OPTIMIZATION TECHNIQUE

(DHU 601) 2nd half, Total Marks: 50, Credit: 2, CPW : 2

Introduction to Operation Research & Optimization technique

Linear Programming :

Introduction to linear programming, Formulation, LPP in the standard form, LPP in canonical form, conversion of LPP in standard form to canonical form, procedure of solving LPP by graphical method.

Introduction to Simplex method, Simplex algorithm.

Shortest path **DJKstra** method.

Project Scheduling :

Project scheduling by PERT/ CPM, Decisions and game theory,

Classical optimization theory, unconstrained External problem.

SOFTWARE ENGINEERING (DCS-601)

Total Marks: 100, Credit: 4 , CPW : 4

DETAIL COURSE CONTENT

GROUP - A (1st half)

Software Engineering and Life Cycle

The evolving role of Software – software engineering, Phases in Software Engineering. Software Crisis/ challenges. Software Life Cycle Model, Spiral Model, Prototype Model.

Software Requirement Analysis

What is Software Requirement ? Feasibility study, Requirement Analysis, Software Requirement Specification (SRS).

Software Design

Basics of Software Design; Data Design; Architectural Design Evolution of software design; Fundamental Design concepts- Abstraction, Refinement, Information hiding, Structure, Modularity, Software architecture, Data structure, Concurrency, Verification; Effective Modular Design, Basic concepts of Data Flow-Oriented Design & Object-Oriented Design.

GROUP - B (2nd half)

Software planning & scheduling

Project planning , scheduling & staffing

Software Cost Estimation

Basics of Software Cost estimation; Software Cost Estimation Techniques – Expert Judgment; & COCOMO.

Software Testing

Testing Objectives; Test plan; Model of software testing, & Testing Strategies

Software Quality Assurance, & MAINTANANCE

Software quality concept; Software Quality Assurance (SQA); SQA activities; Basics of Software maintenance, Enhancing maintainability during development;

REFERENCE BOOKS

Software Engineering, A Practitioner's Approach / Roger S. Pressman / McGraw-Hill

Software Engineering Concepts / Richard E. Fairly / Tata McGraw Hill

Software Engineering Principles and Practice / Hans Van Vliet / Wiley

An Integrated Approach to Software Engineering / Pankaj Jalote / Narosa Pub. House

Fundamental of Software Engineering / Rajib Mall / Prentice Hall of India.

INTERNET TECHNOLOGY (DCS-602)

Total Marks: 100, Cpw: 3, credit: 3

DETAIL COURSE CONTENT

Group – A

(1st half)

The Internet: Brief history. Organization and architecture. Routing in the Internet Transport Layer in the Internet, Quality of Service (QOS): QOS requirements Internet.

Internet Application Layer: DNS, e-mail, SMTP, POP 3, MIME, World Wide Web & HTML Web design basic Client side programming Server side programming Web-enabled databases Web services,

Group – B

(2nd half)

Different IP addressing schemes, Subnetting, Supernetting, Internet as Packet Switched Network, Internet as a connectionless network, Routing techniques, ARP,IP, ICMP, IPV6,UDP,TCP,client server model,

Security protocols in internet IP level security, Firewall, VPN, Attacks in the Internet, IP Spoofing, IP Sniffing, DNS Spoofing, IPsec,

Reference Book:

Data Communication and Networks, Forouzan, Mcgrawhill.

Cryptography and Network Security, Williuam Stallings, LPE

Cryptography and Network Security, Atul Kahate, PHI

Elective

E-COMMERCE (DCS-603/1)

Total Marks: 100, Credit: 3 , CPW : 3

DETAIL COURSE CONTENT

Group A

(1st half)

Module

1. Electronic Commerce : Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, Cyber Laws.
2. Technologies : Relationship Between E – Commerce & Networking, Different Types of Networking For
E – Commerce, Internet, Intranet & Extranet, EDI Systems
Wireless Application Protocol : Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing, Wireless Web, Web Security, Infrastructure Requirement For E – Commerce .
3. Business Models of e – commerce : Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance.
4. Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management ; Content Marketing.
5. Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE).

Group- B

(2nd half)

7. E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections.
8. E – Marketing
9. Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application, EDI Model, Protocols (UN EDI FACT Data Encryption (DES / RSA).
10. Risk of E – Commerce : Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures.

Reference :

1. E-Commerce, M.M. Oka, EPH
2. Kalakotia, Whinston : Frontiers of Electronic Commerce , Pearson Education.
3. Bhaskar Bharat : Electronic Commerce - Technologies & Applications. TMH
4. Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.
5. Murthy : E – Commerce , Himalaya Publishing.
6. E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.

7. Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD
9. Krishnamurthy, E-Commerce Mgmt, Vikas

Elective **COMPUTER GRAPHICS(DCS-603/2)**

Total Marks: 100, Credit: 3 , CPW : 3

DETAIL COURSE CONTENT

GROUP – A

(1st half)

Co-Ordinate System

Origin – Axes and co-ordinate planes – Co-ordinates of a point – Change of origin – Distance of a point from the origin- Distance between two points – Direction cosine of a line – Angle between two co-planar lines – Direction cosine of a line joining two points.

Straight Line

Equation of a straight line in symmetrical form – Normal form - Straight line passing through two given points – Intersection of a straight line & a plane – Condition of coplanarity of two straight line – Distance of a point from a straight line – Skew line – Shortest distance between two skew lines – Image.

Plane

Equation of a plane - Equation of planes in different form: Normal, Intercept form - Planes passing through three Given points –Angle between two planes – Distance of a point from a plane – Two intersecting planes – Intersection of a straight line and a plane –Plane through given straight line.

GROUP – B

(2nd half)

Introduction to Graphic Presentation of Picture

Definition of Computer Graphics – Different Steps to Present a Picture – Picture Files – Display Files – Pixel.

Overview of Graphics System

Cathode Ray Tubes - Raster Scan Displays - Random Scan Displays - Flat Panel Displays.

Output Primitives

Points & lines – Line drawing algorithm – Brasenham’s line drawing algorithm – Circle generating algorithm –Properties of circle – Midpoint circle algorithm – Ellipse generating algorithm – Properties of Ellipse – Mid point ellipse algorithm.

Geometric Transformations

Basic Transformations – Translation – Rotation – Scaling – Homogeneous Co-ordinates – Other Transformations – Reflections in Different Lines, Axis & Points – Shear.

Viewing

Projections – Parallel Projections – Perspective Projections – Windowing – Clipping - Normalized View Volume – View Port Clipping.

Computer Animations

Design of animation sequence – General Computer Animation Function – Raster Animation – Computer Animation Language – Key Frame System – Morphing.

Elective **MOBILE COMPUTING(DCS-603/3)**

Total Marks: 100, Credit: 3 , CPW : 3

Group- A (1st half)

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling. Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML). Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

Group –B (2nd half)

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems. Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

Text :

“Pervasive Computing”, Burkhardt, Pearson

“Mobile Communication”, J. Schiller, Pearson

“Wireless and Mobile Networks Architectures”, Yi-Bing Lin & Imrich Chlamtac, John Wiley & Sons, 2001

“Mobile and Personal Communication systems and services”, Raj Pandya, Prentice Hall of India, 2001.

Reference :

“Guide to Designing and Implementing wireless LANs”, Mark Ciampa, Thomson learning, Vikas Publishing House, 2001.

“Wireless Web Development”, Ray Rischpater, Springer Publishing,

“The Wireless Application Protocol”, Sandeep Singhal, Pearson .

“Third Generation Mobile Telecommunication systems”, by P.Stavronlakis, Springer Publishers,

ADVANCED JAVA (DCS-603/4)

Total Marks: 100, , CPW : 3+1T, Credit: 3

DETAIL COURSE CONTENT

Group – A (1st half)

Client & server side programming.

Enterprise architecture styles: Single tier , 2-tier , 3-tier, n-tier; Relative comparison of the different layers of architectures. MVC Architecture.

Servlet: Introduction, Life cycle, Servlet APIs, Accessing user information by means of Request & Response, Servlet session management techniques and relative comparison.

JSP: Introduction, Architecture/Life cycle, Different types of JSP architectures and relative comparison. JSP tags, Directives, Scripting elements, Actions, Scriplets.

Group – B (2nd half)

EJB: Introduction, Applications, Drawbacks, Different types of enterprise beans, Services provided by EJB container.

JNDI: Introduction and applications, Comparison between LDAP and JNDI

JDO (Java Data Objects): Introduction, Integration of EJB and JDO.

JDBC: Introduction, Database driver, Different approaches to connect an application to a database server, Establishing a database connection and executing SQL statements, JDBC prepared statements, JDBC data sources.

REFERENCE BOOKS :

“Professional JAVA Server Programming”, Allamaraju and Buest ,SPD Publication

“Beginning J2EE 1.4” Ivor Horton, SPD Publication.

“Advanced Programming for JAVA 2 Platform” Austin and Pawlan, Pearson

Reference Books:

Internet & Java Programming by Krishnamoorthy & S. Prabhu(New Age Publication)

Sessional / Practical subjects for 6th Semester

INTERNET TECHNOLOGY LAB (DCS-604S)

Total Marks: 100, Credit: 2 , CPW : 3

DETAIL COURSE CONTENT

Internet Basics

Familiarity with internet browser(MS-Explorer, Netscape),Working with browser window tool bar , menu bar, Browsing a given web site address, Searching a particular topic through search engines.

Familiarity with E-Mail, sending viewing printing e-mail message., Use of mailbox (inbox, outbox) in outlook express. Use of attachment facility available in e-mailing.

Web Server

Familiarity with web server – IIS, PWS etc. – Configuring web server – Creating virtual directory. Internet Services ,Concept and familiarity of various internet services (www, http, ftp, chat etc).

Database management through ASP: Brief overview of ActiveX Data Objects — Using ADO to access a database from ASP (Simple Problem) — Opening, closing database connection — Executing SQL statements.

ADVANCED JAVA LAB(DCS-605S)

Total Marks: 100, , CPW : 4, Credit: 2

DETAIL COURSE CONTENT

Client & server side programming.

Enterprise architecture styles, Servlet, JSP: Introduction, Architecture/Life cycle, Different types of JSP architectures and relative comparison. JSP tags, Directives, Scripting elements, Actions, Scriptlets.

EJB: Introduction, Applications, Drawbacks, Different types of enterprise beans, Services provided by EJB container.

JNDI: Introduction and applications, Comparison between LDAP and JNDI

JDO (Java Data Objects): Introduction, Integration of EJB and JDO.

JDBC: Introduction, Database driver, Different approaches to connect an application to a database server, Establishing a database connection and executing SQL statements, JDBC prepared statements, JDBC data sources.

Text :

“Professional JAVA Server Programming”, Allamaraju and Buest ,SPD Publication

“Beginning J2EE 1.4” Ivor Horton, SPD Publication.

“Advanced Programming for JAVA 2 Platform” Austin and Pawlan, Pearson

Reference Books:

Internet & Java Programming by Krishnamoorthy & S. Prabhu(New Age Publication)

PC MAINTENANCE LAB(DCS-606S)

Total Marks: 100, Credit: 2 , CPW : 4

DETAIL COURSE CONTENT

To install and configure FDD and HDD.

To be familiar with and to be able to troubleshoot motherboard.

To be familiar with SMPS.

To install video card, sound card, etc.

To install DMP, inkjet and laser printing; to undertake preventive maintenance and to troubleshoot DMP.

To disassemble and reassemble a total PC system.

To practice anti-virus software installation and virus removal.

To install Windows 95/98/NT, UNIX, Linux.

To be familiar with different network cables (UTP, STP, Coaxial), Connectors (BNC, BNC-T, RJ-11 (4 wire) RJ-45 (8 wire), DB9, DB15) and Terminator.

To study crimping: RJ-45, RJ-11, Cross-over Cable.

To study the different expansion slots of a motherboard, set the NIC to expansion slot and to install the driver.

To connect HUB with other nodes and HUB-to-HUB.

To make a peer-to-peer Network System.

To run the following application in a network system and get knowledge: (i) FTP, (ii) Telnet, (iii) Mail, and, (iv) Talk.

To use the ping utility in order to understand its use in a trouble shooting environment.

To be familiar with loop back testing.

To be familiar with the idea of socket and to write a socket program.

REFERENCE BOOKS

Hands on networking essentials with projects / M.J. Palmer

Internet working with TCP-IP / D.E. Comer and D. Stevens / Prentice Hall of India

CISCO Internet working / Charles Riley / SPD Pvt. Ltd.

Networking Cabling handbook / Chris Clark / Tata McGraw Hill

Designing and implementing local and WANs / M.J. Palmer and R.B. Sinclair / Vikas Publishing House.

PROJECT -II (DCS-607S)
Total Marks : 200, CPW : 8 , credit : 4

OBJECTIVE

Project Work is intended to provide opportunity for students to develop understanding of the interrelationship between different courses learnt in the entire diploma programme and to apply the knowledge gained in a way that enables them to develop & demonstrate higher order skills. The basic objective of a project class would be to ignite the potential of students' creative ability by enabling them to develop something which has social relevance, aging, it should provide a taste of real life problem that a diploma-holder may encounter as a professional. It will be appreciated if the TIT develop interaction with local industry and local developmental agencies viz. different Panchayet bodies, the municipalities etc. for choosing topics of projects and / or for case study. The course further includes preparation of a Project Report which, among other things, consists of technical description of the project. The Report should be submitted in two copies, one to be retained in the library of the institute. The Report needs to be prepared in computer using Word and CADD software wherever necessary.

COURSE SCHEDULE

THE PROJECT

Each group will take at least one project in the entire session. The following subject areas may be selected for project work. The selected topic, however, need not be limited to those areas only:—

Database Management System,
Operation Research,
Microprocessor interfacing,
Object Oriented Programming,
Graphics Users Interface,
Computer Graphics,
Web based application, and,

a particular project may be part of a bigger project depending upon the complexity.

The Project Report must include the following sections:—

Introduction – Problem definition – Scope and Objective of the problem,
System Environment,
System Analysis and Requirement Analysis,
System Design and Implementation,
System Testing, and,

GENERIC SKILL(DCS-610S)

Total Marks : 50, Credit : 1, CPW : 2

Each class may be divided into two groups. Each group may meet once a week and discuss topics mentioned below under.

Professionalism: Professional characteristics, professional education, professional development in Industry.

Values and Ethics in Profession: Value system- goodness, means and ends; Ethics-ethical premises, expectations, conflicts and practices; Moral and ego, Ethics and morality.

Right, virtue, ethics and justice, utility and justice; Privacy, Challenges to privacy, Privacy on the Internet.

Professional Competence: Important technical topics covered in Semesters II-V as well as topics of current professional interest.

Books:

1. Ethics and Engineering ---by Martin and Schinizer, TMC.
2. Issues and Ethics—by Correy G.Correy , Brooks & Cole Pub.
3. Ethics and Professionalism ---by John Kultgen
4. Ethics and the conduct of business-- by John R.Boatright, PE.

FINAL V I V A (DCS-610)

Total Marks : 50 , credit :1

C O U R S E C O N T E N T

The syllabi of all the theoretical and Sessional subjects taught in the 3years/ 6(six) Semesters of diploma education.

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