

Bodoland University
Curriculum Structures for UG syllabus For Information Technology (Honours)),

No. of papers =14+12=26, Total Credits= 140
Total Marks = 2400

SEM-I						
Paper Code	Course	L+T+P	Credit	End Sem	Int.	Total
IT-101H	C-1	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20 20	100
IT-102H	C-2	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Phy-GE-103H	GE-1	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20 20	100
COMM-104HR	AECC-1:English/ Hindi/MIL (Communication)	2	2	50(L)		50
Total-			20	290	60	350

SEM-II						
Paper Code	Course	L+T+P	Credit	End Sem	Int	Total
IT -201H	C-3	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT-202H	C-4	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Phy-GE-203H	GE-2	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
ENV -204HR	AECC-2: Environmental Science	2	2	50(L)		50
Total-			20	290	60	350

SEM-III						
Paper Code	Course	L+T+P	Credit	End Sem	Int	Total
IT -301H	C-5	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -302H	C-6	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -303H	C-7	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -SEC1- 304HR	SEC-1	2	2	50(L)		50
Math -GE- 305H	GE-3	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Total-			26	370	80	450

SEM-IV						
Paper Code	Course	L+T+P	Credit	End Sem	Int	Total
IT -401H	C-8	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -402H	C-9	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -403H	C-10	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -SEC2- 404HR	SEC-2	2	2	50(L)		50
Math-GE-405H	GE-4	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Total-			26	370	80	450

SEM-V						
Paper Code	Course	L+T+P	Credit	End Sem	Int	Total
IT -501H	C-11	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -502H	C-12	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -DSE1- 503H	DSE-1	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -DSE2- 504H	DSE-2	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Total-			24	320	80	400

SEM-VI						
Paper Code	Course	L+T+P	Credit	End Sem	Int	Total
IT -601H	C-13	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -602H	C-14	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -DSE3- 603H	DSE-3	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
IT -DSE4- 604H	DSE-4 (Project/Diss ertation)	4+0+2 5+1+0	6	60(L)+20(P) 60(L)+20(T)	20	100
Total-			24	320	80	400

1. Where there is a practical there will be no tutorial or vice-versa.
2. Institute should evolve a system/policy about ECA/ General Interest/Hobby/Sports/NCC/NSS/related courses on its own.
3. **Skill Enhancement Courses (SEC):** These courses are to be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge and should contain both theory and lab/hands-on/training/field work. The main purpose of these courses is to provide students life-skills in hands-on mode so as to increase their employability. The list provided under this category are suggestive in nature and each Institution/College has complete freedom to suggest their own papers under this category based on their expertise, specialization, requirements, scope and need. However, in this case approval of Academic section of the University is mandatory.

1st SEMESTER

IT-101 C-1: COMPUTER FUNDAMENTALS AND PROGRAMMING IN C **Theory: 60 Lectures**

Unit 1: Fundamentals (15 Lectures)

Major components of a Digital Computer, Representation of numbers (only a brief introduction to be given) and characters in computer, Interpreter, Assembler, Linker and Loader. Definition and concepts of algorithm and its different implementations-pseudo code, flowchart and Computer programs.

Number System: Binary, Hexadecimal, Octal, BCD, and conversions of number systems. Representation of signed integers, Sign and magnitude, 1's complement and 2's complement representation, conditions for overflow/underflow and its detection.

Unit 2: Introduction to C (25 Lectures)

Elementary data types , variables, constants and identifiers, Reserved word. Expression in C, precedence and associativity of C operators, C operators, L-value and R-value. Side effects of operators. Conditional Statement. Iterative Statement. Other Statement –break , continue, goto, return, null Statement, block Statement.

Function: function declaration. Calling a function. Parameters –Call by value, Call by reference

Recursion and how it works. Cast and sizeof operator.

Unit 3: Arrays and pointers (15 Lectures)

Storage classes. Scope and lifetime of variables. Arrays and pointers and corresponding operators. Pointer arithmetic. Programs using arrays and pointers like sum, average, minimum, maximum of an array of numbers. Add and delete an element of an array. Merge two sorted arrays. String manipulation programs like string concatenation, palindrome, reverse, copy etc. Matrix manipulation like Sum of rows, columns, and diagonal elements of a matrix, transpose of a matrix.

Searching and Sorting

Linear search, binary search. Selection sort and bubble sort.

Unit 4: Structures and Files (5 Lectures)

Structure – declaration and use. Structure member resolution and structure pointer member resolution operators. Programs to show the use of structure. Standard C library.

Files in C—opening, closing, reading and writing of files. Seeking forward and backward. Simple examples of file handling programs.

REFERNCE BOOKS

1. Programming with C, B.S. Gottfried, Tata Mc-Graw Hill.
2. Programming in ANSI C, E.Balagurusamy, Tata McGraw – Hill
3. The C Programming Language, B.W. Kernighan and D.M.Ritchie, PHI
4. Computer Fundamentals, Anita Goel, Pearson, 2010.

IT LAB-101 (C-I): COMPUTER FUNDAMENTALS AND PROGRAMMING IN C Lab Practical: 60 Lectures

At least 20 programming assignments have to be done by each student from the following list. The assignments should be selected in such a way that all the features of C language are included.

1. Write a program to convert a given temperature value from Fahrenheit scale to Centigrade scale and vice versa.
2. Write a program to display ASCII value of a character.
3. Write a program to check whether a number is perfect or not.
4. Write a program to find out the biggest of three numbers using nested if.
5. A company insures its drivers if either of the following conditions are satisfied
 - Driver is married.
 - Driver is an unmarried, male and above 30 years of age.
 - Driver is unmarried, female and above 25 years of age.

Write a program to decide if a driver is to be insured using logical operators.

6. Write a program to read a list of positive integers terminated by -1 and display the odd and even numbers separately and also their respective counts.
7. Write a program to read values of n and x and print the value of y using switch case where
 - a. $y=n+x$ when $n=1$
 - b. $y=1+x/n$ when $n=2$
 - c. $y= n+3x$ when $n=3$
 - d. $y=1+nx$ when $n>3$ or $n<1$.
8. Write a program to n values of sales and then calculate the commission on sales amount where the commission is calculated as follows:
 - a. If sales \leq Rs.500, commission is 5%.
 - b. If sales $>$ 500 but \leq 2000, commission is Rs 35 plus 10% above Rs 500.
 - c. If sales $>$ 2000 but \leq 5000,commission is Rs 185 plus 12% above Rs.2000.
 - d. If sales $>$ 5000 ,commission is 12.5%.
9. Write a program to find out minimum, maximum, sum and average of n numbers without using array.

10. Program to find mean and standard deviation (SD) for a set of n numbers without using array.
11. Write a program to find out the roots of a quadratic equation. Use proper testing to find checks for real and complex roots.
12. Write a program to print the digits of a number in words. (eg. if a number 841 is entered through the keyboard your program should print —Eight Four One!.)
13. Write a program to print the PASCAL Triangle up to the n-th row where n is an input to the program.
14. Write a function to return the HCF of two positive integers. Write a main function to read two positive integers and print their HCF and LCM by using the above function.
15. Write a program to convert a decimal number into binary number using function.
16. Write a program to display the result of sine series using function.
17. Write a program to find the sum of the following series
 $1+x-x^3/3!+x^5/5!-x^7/7!+\dots$ corrected up to the 3 decimal place.
18. Write a program to read n numbers in a sorted array and insert a given element in a particular position
19. Write functions to compute the factorial of a number using both recursive and non-recursive procedure.
20. Write a program to print the values of ncr and npr for given positive integers n r > 0. Use a function fact(n) to return the factorial of a non-negative integer.n.
 $ncr=n!/r!(n-r)!$ $npr=n!/(n-r)!$
21. Write a program to display the first n Fibonacci numbers using function.
22. Write a program to display the prime numbers within a given range. Write a function to check whether a given integer is prime or not and use it.
23. Write a program to Multiply two matrices using function
22. Write a program to display the prime numbers within a given range. Write a function to check whether a given integer is prime or not and use it.
23. Write a program to Multiply two matrices using function
24. Write a program to display the upper Triangle and lower Triangle of a given square matrix using function.
25. Write a function to check if a given square matrix is symmetric or not. Write a main function to implement it.
26. Write a program to read a m X n matrix and calculate the Row sum and Column Sum of the matrix
27. Write a function to read in an integer and print the representation of the number using the sign and magnitude representation scheme using 8 bits. The program should check for overflow/under flow conditions. The left most bit is to be used as the sign bit.
28. Write a program to merge two sorted arrays.
29. Write a program to implement selection sort using function.

30. Write a program to count the number of vowels in a string.
31. Write a program to concatenate two strings using function (without using library function).
32. Write a program to convert a string from upper case to lower case and vice versa.
33. Write a program to swap two numbers using function (pass the pointers).
34. Write a program to sort n number of strings in ascending order using pointer.
35. Write a program using pointers to copy a string to another string variable (without using library function).
36. Declare a structure of a student with details like roll number, student name and total marks. Using this, declare an array with 50 elements. Write a program to read details of n students and print the list of students who have scored 75 marks and above.
37. Create a structure to store the following information of employees.
 - a. Employee's number, name, pay and date of joining.It has been decided to increase the pay as per the following rules:
Pay \leq Rs.3000 : 20% increase
Pay \leq Rs.6000 but $>$ Rs.3000 :15% increase
Pay $>$ Rs.6000 : no increase
Write a program to implement the above structure.
38. Write a program to read a text file and count the number of vowels in the text file.
39. Write a program to copy a text file to another file.

IT-102 (C-2): DISCRETE STRUCTURE

Theory: 60 Lectures

Unit 1: Introduction: (15 Lectures)

Sets - finite and Infinite sets, functions, relations, Properties of Binary Relations, Closure, Partial Ordering Relations; counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion.

Unit 2: Growth of Functions: (8 Lectures)

Asymptotic Notations, Summation formulas and properties, Bounding Summations, approximation by Integrals

Unit 3: Recurrences (10 Lectures)

Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method

Unit 4: Graph Theory (15 Lectures)

Basic Terminology, Models and Types, multigraphs and weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees

5. Propositional Logic (12 Lectures)

Logical Connectives, Well-formed Formulas, Tautologies, Equivalences, Inference Theory

Recommended Books:

1. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985,
2. Kenneth Rosen, Discrete Mathematics and Its Applications, Sixth Edition ,McGraw Hill 2006
3. T.H. Cormen, C.E. Leiserson, R. L. Rivest, Introduction to algorithms, 3rd edition Prentice Hall on India, 2009
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988
5. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
6. D.J. Hunter, Essentials of Discrete Mathematics, Jones and Bartlett Publishers, 2008

IT LAB-102 (C 2): DISCRETE STRUCTURES

Lab Practical: 15 Lectures

1. C programs to implement the Kruskal's algorithm to generate a minimum cost spanning tree.
2. C programs to implement the Prim's algorithm to generate a minimum cost spanning tree.
3. C program to implement Euler Circuit problem.
4. C program to implement Hamiltonian Cycle.
5. C Program to Evaluate Truth Value of Conjunction.
6. C program to Evaluate Truth Value of Disjunction.
7. Write a c program to print the union of two sets.
8. Write a c program to print the intersection of two sets.
9. Write a c program to print the Permutation of character string of two sets.
10. Write a c program to print the combination of a number of two sets.
11. Write a c program to find and print all the elements in the Cartesian product of two sets.
12. Write a c program to print the subtraction of two sets.
13. Write a c program to print the power of two sets.
14. Write a c program to print the proper subset of sets.
15. Write a c program to print the symmetric difference of two sets.

3rd SEMESTER

IT-301 (C-5): DIGITAL LOGIC AND INFORMATION COMMUNICATION TECHNOLOGY

THEORY: 60 LECTURES

Unit1: Boolean algebra and Logic gates (10 Lectures)

Boolean operators, axiomatic definition of Boolean algebra, Rules (postulates and basic theorems) of Boolean algebra, dual and complement of Boolean expression, Canonical form and Standard form, Sum of product and product of sum. Conversion between Boolean expression and truth table. Boolean expression and their simplification by algebraic method, Karnaugh map method (till four variable k-map)

Logic gates:

Different types of gates, Implementation of logic expression with logic gates.

Unit2: Combinational circuit (12 Lectures)

Adder, Subtracters, Decoder, Encoder, Multiplexer, Demultiplexer, programmable logic Array (PLA)

Unit3: Sequential Circuit (10 Lectures)

Simple RS flipflop or latch, Clocked RS flipflop, D flipflop, JK flipflop, T flip flop, Edge triggered flipflop (SR, D, JK), Asynchronous preset and clear inputs, JK Master slave flip flop., edge triggering and level triggering

Unit 4: Evolution of computer system (5 Lectures)

Modern computer, Classification of computer, Personal Computer hardware

Unit 5 Hard Disk Drive (7 Lectures)

Logical structure and file system, Hard disk tools: Disk cleanup, error checking, de fragmentation, scanning for virus, formatting, installing additional HDD. New trends in HDD.

Unit 6: Optical Media

(8 Lectures)

CDROM, theory of operation, drive speed, buffer, cache, CD-r, CD-RW, DVD ROM, DVD technology, preventive maintenance for DVD and CD drives, New Technologies. Driver installation, Writing and cleaning CD and DVD.

Unit 7: Processor

(8 Lectures)

Intel processor family. Latest trends in processor, Motherboard, Sockets and slots, power connectors. Peripheral connectors. Bus slots, USB, pin connectors. Different kinds of motherboards. RAM, Cache and Virtual Memory concept.

Recommended Books:

1. Digital Logic and Computer Design, Morris M. Mano
2. Digital Fundamentals, Floyd and Jain
3. Comdex: Hardware and Networking Course Kit:: DreamTech press PC hardware: A beginners Guide: Ron Gilster: Tata Mc Graw Hill.

IT LAB-301 (C-5): DIGITAL LOGIC AND INFORMATION COMMUNICATION TECHNOLOGY**Lab Practical: 60 Lectures**

1. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.
2. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva.
3. Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.
4. Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.
5. Basic commands in Linux.
6. Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

7. Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.
8. The test consists of various systems with Hardware / Software related troubles, Formatted disks without operating systems. Installation of antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

T-302 (C-6): OBJECT ORIENTED PROGRAMMING USING C++

THEORY: 60 LECTURES

Unit1: Principles of Object Oriented Programming (10 Lectures)

Basic concept of OOP, Procedural programming vs OOP. Introducing Object Oriented Approach relating to other paradigms. Benefits of OOP and methods. Applications of OOP, Review of C, Difference between C and C++.

Unit2: Basic Elements and Ideas (10 Lectures)

Keywords and Identifiers in C++, Variables and Constants, Enumerated variables, Basic data types, Arrays and Strings, User Defined Data types, Operators and Operator Precedence, Manipulators, Type Conversions and type cast operators, Console I/O, Control Statements. Loops, Break, Continue, Pointer new, delete operators. Functions in C++: main function, function prototyping, call by reference, return by reference, functions inline, friend, virtual, library.

Unit3: Classes and Objects (10 Lectures)

Object & classes, attributes, functions, C++ class declaration, member functions, static data members and member functions, friend functions, constant member functions. Constructors and destructors, instantiation of objects, Default parameter value, object types.

Unit4: Overloading (8 Lectures)

Function overloading, Operator overloading

Unit5: Inheritance (8 Lectures)

Concept of inheritance, Types of Inheritance ,Type of Derivations – public, private & protected, Constructors in Derived Classes.

Unit6: Virtual Functions and Polymorphism (5 Lectures)

Polymorphism, compile time polymorphism, run time polymorphism, pointers to derived class , Early binding vs. late binding, virtual function, pure virtual function.

Unit7:Files and Exception Handling

(5 Lectures)

Need For a Data File, Opening and Closing a File, Detecting Endof File, Classes for File Stream Operations , Sequential Input and Output Operations, Random Access File Processing. Concept and Use of Exception Handling.

Unit8: Templates

(4 Lectures)

Function Template and Class Template.

REFERENCE BOOKS

- i) Herber t Schild, — The complete reference to C++||, Osborn McGraw Hill
- ii) R. Lafore, —Object Or iented Programming using C++||, Galgotia Publications
- iii) Ian Graham, —Object Oriented Methodsl||, Addison Wesley.
- iv) E. Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw Hill 1997.
- v) D. ravichandran, —Programming With C++||, Tata McGraw Hill Publishing Company Ltd.

IT LAB-302 (C-6): OBJECT ORIENTED PROGRAMMING USING C++
Lab Practical: 60 LECTURES

Each student should do at least 12 assignments from the following list.

1. Define a class named *triangle* to represent a triangle using the lengths of the three sides. Write a constructor to initialize objects of this class, given the lengths of the sides. Write member functions to check

- (a) if a triangle is isosceles
- (b) if a triangle is equilateral.

Write a main function to test your functions.

2. Define a structure **employee** with the following specifications.

Empno: Integer

Ename: 20 character

Basic, hra, da: float

Calculate() : a function to compute net pay as basic+hra+da with float return type.

Getdata(): a function to read values for empno, ename, basic, hra, da.

Dispdata(): a function to display all the data on the screen

Write a main program to test the program.

3. Define a class *circle* to represent circles. Add a data member *radius* to store the radius of a circle. Write member functions area() and perimeter() to compute the area and perimeter of a circle.

4. Define a class **complex** with two data members **real** and **imag** to represent real and imaginary part of a complex number.

Write member functions

rpart(): to return the real part of a complex number

ipart() : to return the imaginary part of a complex number

Add() : to add two complex numbers.

Mul() : to multiply two complex numbers.

Write constructors with zero, one and two arguments to initialize objects.

// This is an example of polymorphism.

5. Define a class **point** with two data members **xordinate** and **yordinate** to represent all points in the two dimensional plane by storing their x co-ordinate and y co-ordinate values.

Write member functions

dist(): to return the distance of the point from the origin.

slope(): to return the slope of the line obtained by joining this point with the origin.

Write constructors with zero, one and two arguments to initialize objects.

Write a friend function to compute the distance between two points.

6. Define a class **String** with the following data members

char *p;

int size

and write member functions to do the following (without using library function) and using dynamic memory allocation.

Length of the string

Compare two string

Copy one string to another.

Reverse the string.

Write suitable constructors and destructors. Write a copy constructor for the class.

7. For the class **complex** defined in 3 above, overload the <<, >>, + and * operators in the usual sense. Also overload the unary – operator.

8. For the class **string** defined in 5 above, overload the <<, >> and + operators where + is to be used for concatenating two strings.

9. Define a class **time** to store time as hour, minute and second, all being integer values. Write member functions to display time in standard formats. Also overload the ++ and -- operators to increase and decrease a given time by one second where the minute and hour values will have to be updated whenever necessary.

10. Define a class to store matrices. Write suitable friend functions to add and multiply two matrices

11. Write a program to show the implementation of static members using class.

12. Define a class **student** with the following specification:

rollno :integer

sname :20 characters

Derive two classes **artsst** and **scst**. The class **artsst** will represent students belonging to Arts stream and the class **scst** will represent students belonging to science stream. The **artsst** class will have additional data members **ph**, **hs**, **en** and **as** to store marks obtained by a student in three subjects Philosophy, History, English and Assamese. The class **scst** will have additional data members **ph**, **ch**, **ma** and **eg** to store marks obtained in Physics, Chemistry, Mathematics and English.

Write the following member functions in the classes **artsst** and **scst**

ctotal() : A function to calculate the total marks obtained by a student

takedata() : function to accept values of the data members

Showdata() : function to display the mark sheet of a student .

13. Define an abstract base class **printer**. Derive three classes, **laser-printer**, **dmp**, **line-printer** and **ink-jet-printer**. The derived classes will have data members to store the features of that particular printer. Write pure virtual function **display()** in the base class and redefine it in the derived classes.

14. Define a abstract base class **figure** and add to it pure virtual functions

display() to display a figure

get() to input parameters of the figure

area() to compute the area of a figure

perimeter() to compute the perimeter of a figure.

Derive three classes **circle**, **rectangle** and **triangle** from it. A circle is to be represented by its radius, rectangle by its length and breadth and triangle by the lengths of its sides. Write a main function and write necessary statements to achieve run time polymorphism.

15. Write an interactive program to compute square root of a number. The input value must be tested for validity. If it is negative, the user defined function **my_sqrt()** should raise an exception.

16. Define a class **rational** to store rational numbers as a pair of integers, representing the numerator and denominator. Write a member functions for setting the values of the numerator and denominator. This function should raise an exception if attempt is made to set a zero value as the denominator and in such cases it should be set to 1.

17. Write a class template for storing an array of elements. Overload the << and >> operators. Write a member function to sort the array in descending order.

18. Write a class template for representing a singly linked list. Write functions for inserting, deleting, searching and for displaying a linked list. Write a main function to test it on a linked list of integers and characters.

IT-303 (C-7): DATABASE MANAGEMENT SYSTEM

Theory: 60 Lectures

Unit 1:Introduction (6 Lectures)

Characteristics of database approach, data models, database system architecture and data independence.

Unit 2:Entity Relationship(ER) Modeling (8 Lectures)

Entity types, relationships, constraints.

Unit 3:Relation data model (20 Lectures)

Relational model concepts, relational constraints, relational algebra, SQL queries

Unit 4:Database design (15 Lectures)

Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal forms (upto BCNF).

Unit 5:Transaction Processing (3 Lectures)

ACID properties, concurrency control

Unit 6:File Structure and Indexing (8 Lectures)

Operations on files, File of Unordered and ordered records, overview of File organizations, Indexing structures for files (Primary index, secondary index, clustering index)

Books Recommended:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishanan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education, 2013

IT LAB-303 (C-7): Database Management Systems

Lab Practical: 60 Lectures

Create and use the following database schema to answer the given queries.

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL New
Location	Varchar(50)	Yes		Delhi

Query List

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.

6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is A'
14. Query to display Name of all employees either have two R's or have two A's in their name and are either in Dept No = 30 or their Manger's Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.
19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with J', 'A' and M'.
21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Dept Name of all employees who have an A' in their name.
25. Query to display Name, Job, Department No. And Department Name for all the employees working at the Dallas location.
26. Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees' Name who do not have a Manager.
27. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

IT –304 (SEC-1): PROGRAMMING IN JAVA

Theory: 60 Lectures

UNIT 1: Introduction to Java

(4 Lectures)

Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods),

UNIT 2: Arrays, Strings and I/O

(8 Lectures)

Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.

UNIT 3: Object-Oriented Programming Overview

(4 Lectures)

Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT4: Inheritance, Interfaces, Packages, Enumerations, Auto boxing and Metadata

(14 lectures)

Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Autoboxing/Unboxing

UNIT 5: Exception Handling, Threading, Networking and Database Connectivity

(15 Lectures)

Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT 6: Applets and Event Handling

(15 Lectures)

Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and

listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts.

REFERENCE BOOKS

1. Ken Arnold, James Gosling, David Homes, "The Java Programming Language", 4th Edition, 2005.
2. James Gosling, Bill Joy, Guy L Steele Jr, Gilad Bracha, Alex Buckley "The Java Language Specification, Java SE 8 Edition (Java Series)", Published by Addison Wesley, 2014.
3. Joshua Bloch, "Effective Java" 2nd Edition, Publisher: Addison-Wesley, 2008.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1 ,9th Edition, Printice Hall.2012
5. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 2 - Advanced Features)", 9th Edition, Printice Hall.2013
6. Bruce Eckel, "Thinking in Java", 3rd Edition, PHI, 2002.
7. E. Balaguruswamy, "Programming with Java", 4th Edition, McGraw Hill.2009.
8. Paul Deitel, Harvey Deitel, "Java: How to Program", 10th Edition, Prentice Hall, 2011.
9. "Head First Java", Orielly Media Inc. 2nd Edition, 2005.
10. David J. Eck, "Introduction to Programming Using Java", Published by CreateSpace Independent Publishing Platform, 2009.
11. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2nd Edition, 2004.

IT LAB-304 (SEC-1): Programming in Java

Lab Practical: 60 Lectures

1. To find the sum of any number of integers entered as command line arguments
2. To find the factorial of a given number
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of .length in case of a two dimensional array
5. To convert a decimal to binary number
6. To check if a number is prime or not, by taking the number as input from the keyboard
7. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
8. Write a program that show working of different functions of String and StringBuffer class like setCharAt(), setLength(), append(), insert(), concat() and equals().
9. Write a program to create a —distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
10. Modify the —distance class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference

variable to another object reference variable. Further create a third object which is a clone of the first object.

11. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions(from lower to higher data type)
12. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword
13. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program —DivideByZero that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.

5th SEMESTER

IT-501 (C-11): SOFTWARE ENGINEERING

Theory: 60 Lectures

Unit 1: Introduction (8 Lectures)

The Evolving Role of Software, Software Characteristics, Software Engineering as a Layered Technology, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).

Unit 2: Requirement Analysis (10 Lectures)

Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques, Flow Oriented Modeling, Need for SRS, Characteristics and Components of SRS.

Unit 3: Software Project Management (8 Lectures)

Estimation in Project Planning Process, Project Scheduling.

Unit 4: Risk Management (8 Lectures)

Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.

Unit 5: Quality Management (8 Lectures)

Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

Unit 6: Design Engineering (10 Lectures)

Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design.

Unit 7: Testing Strategies & Tactics (8 Lectures)

Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type

Recommended Books:

1. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw-Hill, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.
3. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
4. I. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
5. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
6. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

IT LAB (C-11): SOFTWARE ENGINEERING LAB
Lab Practical: 60 Lectures

S. No.	Practical Title
1.	Problem Statement, <ul style="list-style-type: none">• Process Model
2.	Requirement Analysis: <ul style="list-style-type: none">• Creating a Data Flow• Data Dictionary, Use Cases
3.	Project Management: <ul style="list-style-type: none">• Computing FP• Effort• Schedule, Risk Table, Timeline chart
4.	Design Engineering: <ul style="list-style-type: none">• Architectural Design• Data Design, Component Level Design
5.	Testing: <ul style="list-style-type: none">• Basis Path Testing

Sample Projects:

1. **Criminal Record Management:** Implement a criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

IT 502 (C-12): WEB TECHNOLOGIES
Theory: 60 Lectures

Unit 1: Internet Basics:

3 Lectures

History of the internet , the world wide web, getting connected ,web page, home page, web site, Internet services: email.

Unit 2: Client Server Model:

15 Lectures

Structure of an HTML document. HTML tags. The HTTP protocol details. Client side software. Web browsers (Netscape/Mozilla as example). DHTML Web server architecture and functions of an web server. JDBC and ODBC. Server side vs client side scripts, Dynamic web page. CGI scripts, Java Scripts and JSP as examples. PHP and Perl as scripting language. Browser plugins

Unit 3: Web Object Model: CORBA

5 Lectures

Unit 4 XML:

12 Lectures

Well formed XML syntax. references, well formed documents XML semantics. DTD, XML Schema, RELAXNG. Displaying XML on web. XML extensions. Processing XML files, Using a programming language and the SAX API, Using a programming language and the DOM API, Using a transformation engine and a filter, Push Parsing, Data binding ,Non extractive XML

Unit 5: Distributed Multitiered Application:

10 Lectures

J2EE Components ,J2EE Clients, Web Components, Business Components. J2EE Containers, Container Services, Container Types, Enterprise JavaBeans Technology, Java Server Pages Technology.

Unit 6: Application server:

10 Lectures

Persistence, Transaction processing, Concurrency control, Events using, Java Message Service, naming and directory services (JNDI),Security (Java Cryptography Extension (JCE) and JAAS)

Unit 6 : Web Security:

5 Lectures

Firewall, wrapper and Proxy.

Suggested reading:

1. The Internet Complete, M.L. Young
2. Using CGI by J. Dwight, M. Erwin, R. Niles.
3. Mastering JavaScript and Jscript by J. Jaworski
4. Dynamic HTML by D. Godmann.
5. Understanding HTML by D.P. Nagpal

IT LAB-502 (C-12): WEB TECHNOLOGY

Lab Practical: 60 Lectures

HTML

(At least 12 assignments has to be done from this group)

1. Create a HTML document consisting of HTML heading, paragraphs and images.
2. Create a HTML document and insert comments in the HTML source code and insert horizontal lines.
3. Construct HTML document to set the font of a text , size of the font, style of the font.
4. Create a HTML document to show how to create hyperlinks.
5. Create a HTML document to use an image as a link.
6. Create a HTML document to open link in a new browser window.
7. Create a HTML document to jump to another part of a document (on the same page).
8. Create a HTML document to insert images from another folder or another server.
9. Create an image-map, with clickable regions.
10. Create a HTML document with all table elements (Table, Caption, Table Row, Table Data element, Table Heading Element, THEAD, TFOOT, TBODY)
11. Create HTML document to make an unordered list, an ordered list, different types of ordered lists, different types of unordered lists, Nested list, Definition list.
12. Create HTML form with the all FORM elements (text fields, password field, Checkboxes, Radio buttons, Select elements, Drop-down list with a pre-selected value, Textarea (a multi-line text input field) and buttons.
13. Create HTML document with all Frame elements (FRAMESET, FRAME, NOFRAMES, and INLINE FRAME).
14. Create a HTML document to add AUDIO and VIDEO.
15. . Create a HTML document to aligning images (Let the image float to the left/right of a paragraph)
16. Create a HTML document to jump to a specified section within a frame
17. Construct a HTML document with CSS to Set the background colour of a page.
18. Construct a HTML document with CSS to set an image as the background of a page

19. Construct HTML document with CSS to Set the text color of different elements and align the text.

20. Construct HTML document to set different colours to visited/unvisited links, Specify a background colour for links

XML Each student should do at least 2 assignments from the following list

21. Construct an XML document that contain information about products of an organization.

22. Construct an XML document that contain information of 5 students (such as roll no., name , address, class).

23. Construct an XML document that contain details of 10 books.

JAVAScript (At least 8 assignments has to be done from this group)

24. Write a program in javascript to accept a name from the user and display the same name in an alert box.

25. Write a program in javascript to display a message in a confirm box.

26. Write a program in javascript to display the message ‘_time is running out_’ in the status bar.

27. Write a program in JavaScript to enter marks of a student and find his/her grade according to the following:

if marks>=90 then grade A
if marks>=80 then grade B
if marks>=70 then grade C
if marks>=60 then grade D
else fail.

28. Write a program in JavaScript to create a button and when the button is clicked the message ‘_Hello World_’ is displayed on an alert box..

29. Write a program in JavaScript to accept 2 nos from the user and show the working of all arithmetic operators.

30. Write a program in JavaScript to accept 2 strings and concatenate them.

31. Write a program in JavaScript to display the current date and time.

32. Write a program in JavaScript to find the length of an array.

33. Write a program in JavaScript to check whether a string is palindrome or not.

34. Write a program in JavaScript that responds to a mouse click anywhere on the page
(using mouse click).

35. Write a program in JavaScript to display the contents of a check box in a alert box.

36. Write a program to validate a form in the user id and password forms.

37. Write a program in JavaScript to create a welcome cookie, Button animation, Image map with added JavaScript Simple timing, Timing event in an infinite loop

VBScript (*At least 4 assignments has to be done from this group*)

38. Write a program in VBScript to create a variable.

39. Write a program in VBScript to uppercase to lowercase.

40. Write a program in VBScript to Create an array

41. Write a program in VBScript using conditional statements loop

42. Write a program in VBScript using loop.

43. Write a program in VBScript to display Date and Time

44. Write a program in VBScript to display the current month and day.

ASP

Each student should do at least 2 assignments from the following list

45. Write a program in ASP to interact with a user in a form that uses the "get" method.

46. Write a program in ASP to interact with a user in a form that uses the "post" method.

47. Write a program in ASP to interact with a user in a form with radio buttons.

48. Write a program in ASP to create a welcome cookie.

IT-503 DSE-1(A): MICROPROCESSOR

Theory: 60 Lectures

Unit1: Internal Organization of 8085A microprocessor

(10 Lectures)

User Programmable registers, PC, SP, accumulator, flags, data bus, address bus, control bus, instruction word size, opcode format, data format, memory addressing, I/O addressing, address decoding for memory and I/O.

Unit2: 8085A microprocessor architecture (15 Lectures)

Pinout of 8085A microprocessor, bus, control and status signal, demultiplexing of control signals, bus timings, fetch, decode and execute cycle, timing diagram for opcode fetch memory read and memory write, interfacing memory and I/O.

Unit3: Assembly language programming in 8085A microprocessor (15 Lectures)

Complete instruction set in detail, programming examples, logic operation, counters and time delays, stack and subroutine

Unit4: Interfacing (15 Lectures)

In and OUT instruction, decoding addresses, Interfacing of LED

Unit5: Interrupts (5 Lectures)

Vectored interrupts, interrupt priorities, general purpose programmable peripheral devices, 8255A control and status registers, programming 8255A

Suggested Reading :

1. Microprocessor Architecture, Programming and Application with the 8085 by Ramesh S. Gaonkar.

**IT LAB-503 DSE-1(A): Microprocessor
Lab Practical: 60 Lectures**

Each student should do at least 8 assignments from the following list

1. Write a program to add two 8 bit numbers & store it in a memory location 8820h.
2. Write a program to copy a block of memory from one location 8820h to another location 8840h.
3. Write a program to perform the addition of two 16 bit numbers.
4. Write a program to add two numbers & store it in a register e.
5. Write a program to load two unsigned numbers in register b & c. Subtract b from c. If the result is in 2's complement, convert the result in absolute magnitude & display it.
6. Write a program to find the difference of two numbers & store the result in 8830h.
7. Write a program to find the larger / smaller of two given numbers.
8. Write a program to subtract two numbers and add it to a given memory location.
9. Write a program to perform $xy5$, where x and y are 16bit numbers.

10. Write a program to find 2's complement of a number.

IT-503 DSE-1(B): THEORY OF COMPUTATION

Theory: 60 Lectures

Unit1: Finite Automata (10 Lectures)

DFA, NFA, Equivalence of DFA and NFA. Reduction of the number of states in a finite automata.

Unit2: Regular Languages and Regular Grammar (7 Lectures)

Concept of languages and grammar. Regular expressions. Connection between regular expressions and regular languages. Regular grammars

Unit3: Properties of Regular Languages (10 Lectures)

Closure under simple set operations union, intersection, concatenation, complementation and star closure, proof of pumping lemma for regular language.

Unit4: Context free languages (10 Lectures)

Context free grammars, leftmost and rightmost derivations, derivation trees. Parsing and Ambiguity in grammars and languages. Simplification of Context free Grammars removing useless productions, empty productions and unit productions. Normal forms Chomsky and Greibach normal forms.

Unit5: Pushdown Automata (8 Lectures)

Definition and language accepted, Pushdown Automata and Context free languages. Deterministic PDA and Deterministic Context free Languages.

Unit7: Properties of Context free Languages (5 Lectures)

Pumping Lemma for CFL. Using Pumping Lemma to show certain languages not to be Context free.

Unit8: Complexity Classes (10 Lectures)

Time and Space complexity of algorithms, average case and worst case analysis, asymptotic notation as a measure of algorithm complexity and notations. Analysis of sorting algorithms Selection sort, Bubble sort, Insertion sort, Heap sort, Quick sort and analysis of searching algorithms – linear search and binary search.

Suggested Reading

1. An introduction to Formal Languages and Automata, Peter Linz, Narosa.
2. Introduction to Automata Theory, Languages and Computation, Hopcroft and Ullman, Addison Wesley.
3. K. L. P. Mishra, N. Chandrasekaran; Theory of Computer Science (Automata, Languages and Computation), P. H. I.
4. T. H. Cormen, C. E. Leiserson and R. L. Rivest, Introduction to Algorithms, Tata Mcgraw Hill Publishers.

IT-504 DSE-2(A): WEB APPLICATION DESIGN USING PHP
Theory: 60 Lectures

UNIT I

(8 Lectures)

Introduction to PHP as a programming Language, object oriented support, benefits in running PHP as a server side script. Installing a web server, Internet information server, and IIS installation, testing web server setup.

UNIT II

(16 Lectures)

The basics of PHP: - data types, variables, constants, operators, Arrays, Conditional statements (if statement, Executing Multiple Statements, else if clause and switch statement), Iterations (for loop, while loop, controlling an array using a while loop, do while statement, for each loop and special loop key words)

String Manipulation and Regular Expression:

Creating and accessing String , Searching & Replacing String, Formatting, joining and splitting String , String Related Library functions, use and advantage of regular expression over inbuilt function , use of preg_match(), preg_replace(), preg_split() functions in regular expression

UNIT III

(10 Lectures)

Functions, user defined functions, functions with arguments, built in functions(print(), includer(), header(), phpinfo()), PHP server Variables, working with date and time , performing mathematical operations , working with string functions . System Variable (GET, POST, cookies& Session, Forums)

UNIT IV

(16 Lectures)

Working with forms, form elements (Text Box, Text Area, Password, Radio Button, Checkbox, The Combo Box, Hidden Field and image), adding elements to a form, uploading files to the Web Server using PHP, Error handling in PHP: - Displaying errors, warnings, types of errors, error levels in PHP, logging Errors and Ignoring errors.

UNIT V

(10 Lectures)

Data base connectivity using PHP (MySQL, ODBC, ORACLE, SQL) Performing, executing Commands, different types of Data Base Operations like Insertion, deletion, update and query on data

REFERENCE BOOKS

1. Beginning PHP and MySQL,W. Jason Gilmore, Apress, 2010, Fourth Edition Froovice to Professional.
2. PHP6 and MySQL, Steve Suehring, Tim Converse and Joyce Park, Wiley India 2010, Second Edition.
3. HTML4 Complete ,E.Stephen Mask, Janan Platt BPB Publications, First Edition 1998.

IT LAB-504 DSE-2(A): WEB APPLICATION DESIGN USING PHP
Lab Practical: 60 Lectures

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
Sample string : 'The quick " " brown fox' Expected Output : Thequick""brownfox
9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
11. Write a PHP script that checks if a string contains another string.
12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
13. Create a script to construct the following pattern, using nested for loop.

```
*  
* *  
* * *  
* * * *  
* * * * *
```
14. Write a simple PHP program to check that emails are valid.
15. WAP to print first n even numbers.
17. Using switch case and dropdown list display a —Hellol message depending on the language selected in drop down list.

IT-504 DSE-2(B): DATA MINING AND WAREHOUSING

Theory: 60 Lectures

Unit-I: Data Warehousing

(15 Lectures)

Overview and concepts: Need for Data Warehousing, Basic elements of Data Warehousing, differences between Database Systems and Data Warehouse.

Planning and Requirements: Project planning and management, collecting the requirements. Architecture and Infrastructure: Data Warehouse Architecture and its components

Data Design and Data Representation: Principles of dimensional modeling, advanced topics data extraction, transformation and loading, data quality.

Information Access and Delivery: Matching information to classes of users, OLAP in Data Warehouse, Data warehousing and the web.

Implementation and Maintenance: Physical design process, Data Warehouse deployment, growth and maintenance.

Unit-2: Data Mining

Introduction

(10 Lectures)

Different definitions of Data Mining and related concepts, Data mining process Data preparation, data cleaning and data visualization. KDD process. Data mining techniques: Clustering, Association rules and Decision trees.

Unit-3: Clustering

(12 Lectures)

Partitional versus Hierarchical Clustering, types of data in clustering.

Partitional clustering methods – k-means, k-medoids, PAM, CLARA

Hierarchical clustering methods – BIRCH, CURE. Density based clustering methods DBSCAN.

Unit-4: Rule Mining

(12 Lectures)

What is an association rule? Mining association rules, frequent sets and border sets, algorithms for mining association rules – Apriori algorithm, Border algorithm.

Unit-5: Decision Trees

(6 Lectures)

Decision tree generation algorithms – CART, ID3.

Unit-6: Advanced Topics

(5 Lectures)

(only basics of the following topics):

Web mining : Web Content Mining, Web Structure , Mining, Web Usage mining. Spatial mining

REFERENCE BOOKS

1. A.K. Puzari, Data Mining Techniques, University Press..
2. J. Han and M. Kamber. Data Mining: Concepts and Techniques. Morgan Kaufman. 2001.