DETAILED SYLLABUS
FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA)
(FOR BATCH 2017-2020)
UNDER CBCS SYSTEM

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BCA Programme Scheme

Scheme for Bachelor of Computer Applications (CBCS) - 2017-20

SEMESTER	CORE COURSE COMPULSORY (CCC) (6 Credit each)	CORE COURSE ELECTIVE (CCE) (Choose any One per semester) (6 Credit each)	Ability Enhancement Compulsory Course (AECC) (3 Credit each)	Skill Enhancement Course (SEC) (3 Credit each)	Open Electives (OE) (Choose any One per semester) (3 Credit each)
No. of Courses	14	4	2	4	6
I	• Programming with C (4:0:2) • Database Management Systems (4:0:2) • Elementary Mathematics (4:2:0)	-------	• Communicative English & Hindi (3:0:0)	-------	• Fundamentals of Computers & Information Technology(2:1:0) • Office Automation & PC Packages (2:0:1) • Multimedia (2:0:1) • Python Programming (2:0:1) • Information Security Basics (2:0:1) • VBA Programming (2:0:1) • RDBMS using MySQL (2:0:1) • Linux & Shell Programming (2:0:1) • Working with OS (DOS, Windows & Linux) (2:0:1) • Software Engineering (2:1:0)
II	• Advanced C Programming (4:0:2) • Data Structure(4:0:2) • Digital Electronics (4:2:0)	-------	• Environmental Studies (3:0:0)	-------	
III	• Object Oriented Programming with C++ (4:0:2) • Computer Networks (4:2:0)	• Management Theory & Practices (4:2:0) • Discrete Mathematics (4:2:0)	-------	• Computer Hardware Maintenance And Troubleshooting (2:0:1)	
IV	• Java Programming (4:0:2) • Operating Systems (4:2:0)	• System Analysis & Design (4:2:0) • E-Commerce & E-Governance (4:2:0)	-------	• Web Designing (HTML, CSS, JavaScript) (2:0:1)	
V	• Dot Net Programming (4:0:2) • Web Development with PHP (4:0:2)	• Windows Server Administration (4:0:2) • Linux Server Administration (4:0:2)	-------	• Oracle (2:0:1)	
VI	• Project -Analysis & Design (0:2:4) • Project -Development & Implementation (0:2:4)	• Cloud Computing (4:0:2) • Android Programming (4:0:2)	-------	• Computerised Accounting with Tally (2:0:1)	

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MARKING SCHEME FOR

BACHELOR OF COMPUTER APPLICATIONS (BCA)

SEMESTER – I

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
1BCACCC1	Programming with C	4	0	2	50	30	20	100
1BCACCC2	Database Management Systems	4	0	2	50	30	20	100
1BCACCC3	Elementary Mathematics	4	2	0	80	0	20	100
1BCAAEC1	Communicative English & Hindi	3	0	0	40	0	10	50
1BCAOE1	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

*(*CC – Core Compulsory Course, AEC – Ability Enhancement Course, DSE-Department Specific Elective Course, SEC- Skill Enhancement Course, OE-Open Elective Course, L-Lecture, T-Tutorial, P-Practical)*

SEMESTER – II

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
2BCACCC4	Advanced C Programming	4	0	2	50	30	20	100
2BCACCC5	Data Structure	4	0	2	50	30	20	100
2BCACCC6	Digital Electronics	4	2	0	80	0	20	100
2BCAAEC2	Environmental Studies	3	0	0	40	0	10	50
2BCAOE2	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

SEMESTER – III

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
3BCACCC7	Object Oriented Programming with C++	4	0	2	50	30	20	100
3BCACCC8	Computer Networks	4	2	0	80	0	20	100
3BCACCE(A) **OR** 3BCACCE(B)	Management Theory & Practices	4	0	2	50	30	20	100
	Discrete Mathematics	4	2	0	80	0	20	100
3BCASEC1	Computer Hardware Maintenance And Troubleshooting	2	0	1	25	15	10	50
3BCAOE3	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

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SEMESTER – IV

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
4BCACCC9	Java Programming	4	0	2	50	30	20	100
4BCACCC10	Operating Systems	4	2	0	80	0	20	100
4BCACCE(A) **OR** 4BCACCE(B)	System Analysis & Design	4	2	0	80	0	20	100
	E-Commerce & E-Governance	4	2	0	80	0	20	100
4BCASEC2	Web Designing (HTML, CSS, JavaScript)	2	0	1	25	15	10	50
4BCAOE4	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

SEMESTER – V

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
5BCACCC11	Dot Net Programming	4	0	2	50	30	20	100
5BCACCC12	Web Development with PHP	4	0	2	50	30	20	100
5BCACCE(A) **OR** 5BCACCE(B)	Windows Server Administration	4	0	2	50	30	20	100
	Linux Server Administration	4	0	2	50	30	20	100
5BCASEC3	Oracle	2	0	1	25	15	10	50
5BCAOE5	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

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SEMESTER – VI

Subject Code	Subject Name	Scheme			Theory Paper	Practical Exams	Internal Evaluation	Total Marks
		L	T	P				
6BCACCC13	Project – Analysis & Design	0	2	4	0	80	20	100
6BCACCC14	Project – Development & Implementation	0	2	4	0	80	20	100
6BCACCE(A)	Cloud Computing	4	0	2	50	30	20	100
OR								
6BCACCE(B)	Android Programming	4	0	2	50	30	20	100
6BCASEC4	Computerised Accounting with Tally	2	0	1	25	15	10	50
6BCAOE6	Open Elective (Select a subject from any department's Open Elective course list)	2	1	0	40	0	10	50
		2	0	1	25	15	10	50
							GRAND TOTAL	**400**

OPEN ELECTIVES OFFERED AT THE UG LEVEL BY CSA DEPARTMENT

CSAOEUG-(A)	Fundamentals of Computers & Information Technology(2:1:0)
CSAOEUG-(B)	Office Automation & PC Packages (2:0:1)
CSAOEUG-(C)	Multimedia (2:0:1)
CSAOEUG-(D)	Python Programming (2:0:1)
CSAOEUG-(E)	Information Security Basics (2:0:1)
CSAOEUG-(F)	VBA Programming (2:0:1)
CSAOEUG-(G)	RDBMS using MySQL (2:0:1)
CSAOEUG-(H)	Linux & Shell Programming (2:0:1)
CSAOEUG-(I)	Working with OS (DOS, Windows & Linux) (2:0:1)
CSAOEUG-(J)	Software Engineering (2:1:0)

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SEMESTER - I

1BCACCC1- PROGRAMMING WITH C

Credit:6 (L:T:P 4:0:2)

Course Objectives

The purpose of this course is to

- Provide the knowledge of Programming Language to students.
- Prepare students for professional role of Programmers.
- learn about Programming Methodology, Concepts of C Programming like Control Structures, Functions,
- Learn about Arrays, Structures etc.

UNIT - I

Program Concept, Characteristics of Programming, Various Stages in Program Development, Algorithms, Flow Charts, Programming Techniques – Top Down, Bottom Up, Modular, Structured, Features, Merits, Demerits and Their Comparative Study. Programming Logic - Simple, Branching, Looping, Recursion, Programming Testing & Debugging.

UNIT - II

Introduction to C Language, C Language Standards, Features of C, Structure of C Program, Introduction to C Compilers, Creating, Compiling and Executing C Programs, IDE, Features of Turbo C Compiler. Keywords, Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. Library Functions, Character Input/Output- getch(), getchar(). getche(), putchar(). Formatted Input/Output - printf() and scanf(), Mathematical & Character Functions.

UNIT - III

Control Structures: Declaration Statement, Conditional Statement - if Statement, if else Statement, Nesting of if... .else Statement, else if Ladder, The ?: Operator, switch Statement. Iteration Statements - for Loop, while Loop, do-while Loop. Jump Statements: break, continue, goto, exit(). Arrays - Concept of Single and Multi Dimensional Arrays, Array Declaration and Initialization. Strings : Declaration, Initialization, String Functions

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UNIT – IV

The Need of C Functions, User Defined and Library Function, Prototype of Functions, Prototype of main() Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array as Function Argument, Command Line Arguments, Storage Class Specifier - Auto, Extern, Static, Register.

UNIT – V

Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Member Access Operator, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that Return Structure, Union.

Expected Outcomes

At the end of this course,

- A student will have good hands on C Programming Language.
- A student will be able to take the role of Professional Programmers.
- A student will be able to apply his programming knowledge to develop C Programs on Control Structures, Functions etc.
- A student will be able to apply his programming knowledge to develop C Programs on Arrays, Structures, and Union etc.

Text Books:

- E. BALAGURUSWAMY, "PROGRAMMING IN C ", TMH PUBLICATIONS
- YASHWANT KANETKAR , "LET US C", BPB PUBLICATIONS

Reference Books:

- GOTTFRIED SCHAUMS OUTLINE SERIES, "PROGRAMMING WITH C ", TMH PUBLICATIONS
- MAHAPATRA, " THINKING IN C ", PHI PUBLICATIONS
- ANURAG SEETHA, "INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY", RAIN PRASAD & SONS, BHOPAL
- S.K. BASANDRA, "COMPUTERS TODAY", GALGOTIA PUBLICATIONS.
- PETER JULIFF "PROGRAM DESIGN" PHI PUBLICATIONS

C Programming Lab

List of Practicals:

1. Write a Program in C to calculate Simple Interest when the values of Principal , Rate and Time are given.

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2. Write a Program in C to calculate area of a circle when its radius is input from keyboard.
3. Write a Program in C to calculate Temperature in Centigrade when temperature in Fahrenheit is input from keyboard.
4. Write a Program in C to calculate area of a triangle when its three sides are input from keyboard (by Hero's Formula).
5. Write a Program in C to determine whether an input Year is Leap Year or not.
6. Write a Program in C to display the Table of a number input from keyboard in the following format:

   a. n x 1 = n

   eg: 5 x 1 = 5

   b. 5 x 2 = 10

7. Write a Program in C to display the Table of tables from 1 to 10.

1
1 2
1 2 3
1 2 3 4

8. Write a Program in C to display the following Patterns
9. Write a program to calculate the Factorial of a number input from Keyboard using Recursive method.
10. Write a Program in C to show how to pass an Array to a user defined function.
11. Write a Program in C to display Largest element of an Array when the elements of the array are input from keyboard.
12. Write a Program in C to calculate Area of a Circle in a user defined function.
13. Write a Program in C to Swap two numbers using Call by Value and Call by Address.
14. Write a Program in C to reads Name, Roll No, Percentage of five Students and display them using Array of Structures.
15. Write a Program in C to show how to pass an Structure to a user defined function.
16. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by the user. Assign grades according to the following criteria :

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a. Grade A: Percentage >=80

b. Grade B: Percentage>=70 and <80

c. Grade C: Percentage>=60 and <70

d. Grade D: Percentage>=40 and <60

e. Grade E: Percentage<40

17. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.

18. Write a Program in C to display the first n terms of Fibonacci series.

19. Write a Program in C to calculate the sum of two compatible matrices.

20. Write a Program in C to calculate the product of two compatible matrices.

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1BCACCC2-DATABASE MANAGEMENT SYSTEM

Credit:6 (L:T:P 4:0:2)

Course Objectives:

- To understand difference between storing data in FMS and DBMS and advantages of DBMS.
- To understand conceptual and physical design of a database.
- To understand RDBMS and to design Relational database.
- To know basic database backup and recovery.
- To know basics of advances in DBMS.

UNIT - I

INTODUCTION TO DATABASE SYSTEM

Data - Database Applications - Evolution of DB & DBMS - Need for data management, Introduction and applications of DBMS ,File systems versus Database systems ,Data Models , DBMS Architecture, Data Independence, Data Modeling using Entity ,Relationship Model , Enhanced ER Modeling.

UNIT - II

RELATIONAL DATABASE CONCEPT AND DESIGN

Introduction to relational database, Structure of Relational Database, Relational model terminology domains, Attributes, Tuples, Relations, relational DB schema.

Relational algebra: Basic operations selection and projection,

Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner Outer ,Left outer, Right outer and full outer join.

Relational Database design, Functional Dependency ,definition, trivial and nontrivial FD, Normalization 1Nf, 2NF, 3NF, Decomposition using FD dependency preservation, BCNF, Multi valued dependency, 4NF, Join dependency and 5NF

UNIT - III

Database storage and querying -Basic Concepts Of Indexing and Hashing Query Processing, Measures Of Query Cost, Query Processing for Select, Sort Join Operations. Basics of Query Optimization, Transformation of Relational Expression Estimating Statistics of Expression, Choice of Evaluation Plan.

UNIT - IV

Concurrency, Recovery and Security -Concurrency Control: Definition of concurrency, lost update, dirty read and incorrect summary problems due to concurrency

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Concurrency Control Techniques: Overview of Locking, 2PL, Timestamp ordering, multi-versioning, validation Recovery concepts, Shadow paging, Log Based Recovery,

Elementary concepts of Database security: system failure, Backup and Recovery Techniques, authorization and authentication.

UNIT - V

Introduction to Current Trends – Centralized and Client Server Architectures, Distributed Databases, Object Oriented Database, Spatial & Temporal Databases, Data Mining & Warehousing, Data Visualization, Mobile Databases, OODB & XML Databases, Multimedia & Web Databases.

Course Outcome

- Evaluate business information problem and find the requirements of a problem in terms of data.
- Understand, appreciate and effectively explain the concepts of database technologies.
- Understand the uses the database schema and need for normalization.
- Design a database Using ER modeling and Normalization to a given Business information Problem.
- Understand issues and techniques relating to concurrency and recovery in multi-user database environments.

TEXT BOOKS:

- Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 7th Edition, McGraw Hill .
- Rajesh Narang "Database management System" PHI.

REFERENCE BOOKS:

- Ramakrishnan and Gherke, "Database Management Systems", TMH.
- R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Pearson,5th Ed.
- Singh S.K., "Database System Concepts, design and application", Pearson Education
- Bipin Desai, "An Introduction to database Systems", Galgotia Publications.

DBMS Lab

1. Draw an ER diagram to University Database.
2. Draw an ER diagram to Library management System.
3. Create a Library management Schema/ database and search anomalies in it.
4. Assume a video library maintains a database of movies rented out. Without any normalization, all information is stored in one table as shown below.

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Full Names	Physical Address	Movies rented	Salutation	Category
Janet Jones	First Street Plot No 4	Pirates of the Caribbean, Clash of the Titans	Ms.	Action, Action
Robert Phil	3rd Street 34	Forgetting Sarah Marshal, Daddy's Little Girls	Mr.	Romance, Romance
Robert Phil	5th Avenue	Clash of the Titans	Mr.	Action

5. Normalize the following Schema with given Constraints.

books(accessionno,isbn,title,author,publisher)
users(userid,name,deptid,deptname)
accessionno ->isbn
isbn ->title
isbn -> publisher
isbn ->title
userid -> name,
userid -> deptid
deptid -> department

6. Compare 3NF and BCNF with appropriate example.
7. Give exercise on DDL and DML .
8. Learn Concept of Form and Report with basic example.
9. Create a database named "school.mdb" and perform the following tasks using MS Access or My SQL

a. Create a table named "studentinfo" having following table structure.

Field Name	Data Type	Structure
Class	Number	
Section	Text	
Roll No.	Number	
Name	Text	40 Characters Long
Status	LookUp Wizard	Two Value:Senior and Junior
Photo	OLE Object	Photos of Student
DOB	Date/Time	Date of Birth Of students
Remarks	memo	

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b. Fill at least 5 records.
c. Prepare a query to display all records and Name should be in ascending order.
d. Prepare a query named "senior" to display records including fields name, class, sec, rollno, status, photo and value of "status" field must be senior.
e. Prepare a form of above query "senior".
f. Prepare a report of all the fields of above table.

10. Create a database named "library.mdb" and perform the following tasks:

a. Create a table named "Book" having following structure:

Field Name	Data Type
Bookid	Text
BName	Text
WName	Text
PYear	Date/Time
PName	Text
Price	Currency

b. Add at least 5 records.
c. Prepare a query to display only records including book name, writer name and publication name. Save the query as "q_book".
d. Prepare a query to display all records on the basis of price which is more than Rs500.
e. Prepare a form on the basis of table.
f. Prepare a report on the basis of query named "q_book".

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1BCACCC3- ELEMENTARY MATHEMATICS

Credit:6 (L:T:P 4:2:0)

Course Objectivess

- To enable professional undergraduate students to understand some fundamental mathematical concepts and terminology.
- To develop some Mathematical Maturity, that enhances their ability to understand and create mathematical Arguments.
- The course includes topics with importance of mathematics in Computer Science such as discrete mathematics, database theory analysis of algorithm.
- It Includes fundamentals of Reasoning Theory.
- It also includes basics of Statistics which enriches students understanding for data analysis.

UNIT – I

Sets and Elements, Power Set, Universal Set. Union and Intersection of Sets. Difference of Sets. Complement of a Set. Ordered Pairs, Cartesian Product of Sets. Number of Elements in the Cartesian Product of two Finite Sets. Equality of Sets, Transitivity of Set Inclusion, Universal Set, Complement of a Set, Subsets Proper and Improper Subsets ,Union of Sets, Properties of Union .Operation, Intersection of Sets, Disjoint Sets, Properties of Intersection Operation, Relative Complement of a Set, De Morgan's Laws, Distributive Laws of Union and Intersection . Definition of Relation, Pictorial Diagrams, Domain. Co- domain and Range of a Relation.

UNIT - II

Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.

Fundamental principle of counting. Factorial n. (n!), Permutations and combinations

UNIT - III

Determinant: Determinant of 3rd order, Cramer's rule, Consistency of equations

Matrices: Types of matrices, Algebra of matrices, Linear homogeneous equations, Linear non-homogeneous equations.

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UNIT - IV

Mathematical reasoning : Mathematically acceptable statements. Connecting words/ phrases – consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics.

Definition of Statistics, Raw data, Classification of data, Average, Scatter, range, Relationship between Mean ,Median, Mode , Dispersion ,Mean Deviation, Standard Deviation, Variance.

UNIT - V

Meaning of Probability, Random Experiment an outcome, Sample Space, Sample Point, Types of Sample Space, Types of Events, and Probability of an Event, Total and Conditional Probability, Probability distribution of a random Variable, Repeated independent (Bernoulli) trials and Binomial distribution.

Expected Outcomes

After Completion of the course student must be able to

- Understand and Practice Set theory basics and operations.
- Understand and Practice Relations and Functions.
- Understand and Practice Determinant and matrices.
- Understand and Practice Logic.
- Understand and practice foundation of Statistics and Probability theory.

TEXT & REFERENCE BOOKS:

- www.e-booksdirectory.com/mathematics
- www.origoeducation.com/go-maths
- Basics of Mathematics By R. D Sharma.
- Statistics and Solution By V. K. Kapoor

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1BCAAEC1- COMMUNICATIVE ENGLISH & HINDI

Credit:3 (L:T:P 3:0:0)

Unit – 1 Language Skills and Presentation

1.1 Speaking Skills and Presentation: Presentation Design and Delivery.

1.2 Monologue Dialogue, Group Discussion.

1.3 Effective Communication/ Mis-Communication.

1.4 Interview, Public Speech.

1.5 Effective Writing, Report Writing, Resume, Circular, Notice and letter Writing.

Unit – 2 Reading and Understanding

2.1 Importance of English as a vehicle of Spoken and written Communication.

2.2 Close Reading Comprehension Summary Paraphrasing Analysis and Interpretation.

2.3 Translation (from Indian language to English and vice-versa).

2.4 Introduction to Articles of eminent Indian authors.

2.5 Short Stories of eminent Indian authors.

Unit – 3 हिन्दी भाषा का परिचय

3.1 भाषा की विकास यात्रा।

3.2 हिन्दी भाषा की संवैधानिक स्थितिः समस्याएँ और समाधान।

3.3 भाषाः विभिन्न बोलियाँ व स्वरूप।

3.4 भाषा परिवार और भारतीय भाषाएँ।

3.5 वर्तमान संदर्भ में हिन्दी की उपादेयता।

Unit – 4 भाषा

4.1 शब्दों की संस्कृति एवं उनका इतिहास। भाषा एवं संस्कृति। भाषा एवं समाज।

4.2 हिंदी में शब्द संरचना एवं उसके प्रयोगों की विशेषताएं।

4.3 संधि, समास, उपसर्ग, प्रत्यय, पर्यायवाची, विलोमार्थी, अनेकार्थक, समूहार्थक शब्द (व्यावहारिक, व्याकरण केवल परिचयात्मक)।

4.4 वाक्य, रचना एवं प्रकार।

4.5 वाक्य रचना के कारक, वाक्य रचना की सामान्य विधियां।

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Unit – 5 Translation अनुवाद

5.1 अनुवाद का अर्थ और परिभाषा।

5.2 अनुवाद के प्रकार।

5.3 अनुवाद के उपकरण एवं समस्या।

5.4 भाव तथा प्रभाव के आधार पर अनुवाद एवं लेख।

5.5 अनुवाद - Hindi to English and English to Hindi.

Suggested Readings:

- Pathway to Greatness - APJ Abdul kalam
- Wise and Otherwise - Sudha Murthy
- The Serpents Revenue - Sudha Murthy
- World Myths and Legends - Anita Nair
- The Mother I Never Knew - Sudha Murthy
- The Jungle Book - R Kippling
- Malgudi Days - R K Narayana
- Collected Stories - The Adventure of Rusty Ruskin Bond
- अनुवाद विकास एवं संप्रेषण - डॉ. हरिमोहन
- अनुवाद कला सिद्धांत और प्रयोग - डॉ. कैलाश भाटिया
- व्यावहारिक हिंदी - डॉ. माखेन्द्र पाठक
- परिष्कृत हिंदी व्याकरण - बदरीनाथ
- अच्छी हिंदी - रामचंद्र वर्मा
- प्रेमचंद एवं जयशंकर प्रसाद की कहानियॉ

1BCAOE1- OPEN ELECTIVE

Credit:3

Choose form the list given from this department or from other department

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SEMESTER - II

2BCACCC4- ADVANCED C PROGRAMMING

Credit:6 (L:T:P 4:0:2)

Course Objectives

The purpose of this course is to

- Provide the deep knowledge of advanced topics of C Programming Language
- Learn about Advance Programming Concepts like Pointers, File Handling, Preprocessor, Macro etc.
- Learn about Advance Programming Concepts like Graphics, ROM-BIOS Routines etc.

UNIT - I

Basics of Pointers, Pointers Operators, Pointer Arithmetic, Pointers and Function, Pointer and Strings, Pointer to Structure, Pointers within Structure, Introduction to Static and Dynamic Memory Allocation, The Process of Dynamic Memory Allocation, DMA Functions : malloc(), calloc(), free(), realloc(), sizeof() Operator.

UNIT – II

Introduction to File Handling, File Structure, File Types : Streams, Text, Binary; File System Basics, The File Pointer, Opening a File and Closing a File, Functions for File Handling : fopen(), fclose(), getc(),fgetc(), putc(), fputc(), feof(), gets(), puts(), fgets(), fputs(), getw(), putw(), fscanf(), fprintf(), fread(), fwrite(), Standard Streams in C, Flushing a Stream, Direct Access File and Random Access to File : fseek(), ftell(), rewind(); File Name as Command Line Argument.

UNIT - III

Preprocessor and its Advantages, Preprocessor Directives, Macros with and without Arguments, #Define, #Include; Creating Header Files, Include User Defined Header Files, Conditional Compilation Directives: #if, #else, #elif and #ifdef & undef; Using defined, #error, #line, #pragma, The # & ## Preprocessor Operator.

UNIT - IV

Display adapter, Graphics Mode and Resolution, Header File "Graphics. h". Various Functions of Graphics, Function initgraph() and its Arguments, Functions Used in Graphics - Drawing a Point on Screen, Drawing Lines, Rectangle, Circles, Arcs, Polygon. Functions to Fill Colors. Display Text in Graphics Mode, Justifying Text.

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UNIT – V

Working with ROM BIOS Routines, IVT, Registers for Passing Arguments to BIOS Routine. Function int86(), Finding Installed Memory Size and Clearing Screen using int86(), Working with Mouse and Keyboard, Working with DOS Routines, Function intdos(), Renaming File, Deleting File, Create Directory, Delete Directory using intdos()

Modular Programming - Multiple file programs, Extern and static declaration (for variables and for functions), How executable file are created?, The compiler, The linker, Project structure, Object libraries

Expected Outcomes

At the end of this course,

- A student will have deep knowledge C Programming.
- A student will be able to take the role of Professional Programmers.
- A student will be able to apply his programming knowledge to develop C Programs on Pointers, File Handling, Preprocessor, Macro, etc.
- A student will be able to apply his programming knowledge to develop C Programs on Graphics, ROM-BIOS Routines, DOS Routines etc.

Text Books:

- E. BALAGURUSWAMY, "PROGRAMMING IN C ", TMH PUBLICATIONS
- YASHWANT KANETKAR , "LET US C", BPB PUBLICATIONS

Reference Books

- HERBERT SHIELD, "COMPLETE REFERENCE C"
- YASHAVANT KANETKAR, "POINTERS THROUGH C ", BPB PUBLICATIONS
- YASHAVANT KANETKAR, "TSR THROUGH C", BPB PUBLICATIONS
- YASHAVANT KANETKAR, "GRAPHICS UNDER C", BPB PUBLICATIONS
- R.S SALARIA, "APPLICATION PROGRAMMING IN C"

Advanced C Programming Lab

List of Practical :

1. Write a C program to show the addresses of elements of array of different datatypes ?
2. Write a C program to calculate Area and Circumferences of a circle in a single user-define function and print the result in main() ?
3. Write a C program to pass an entire array to a user-defined function and multiply each element by 3 inside the function and print the elements of the array in main() ?
4. Write a C program to show usage of pointer to structure using arrow operators?

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5. Write a C program to show usage of pointer to function?
6. Write a C program to show parameters passing using call by reference method?
7. Write a C program to display content of a existing text file on a screen when the file name input from keyboard?
8. Write a C program to copy the contents of a text file to another a text file and display the contents of another file on the screen?
9. Write a C program to read employee ID, NAME & SALARY of some of a employees of a company in a text file. Using fwrite() function?
10. Write a C program to read employee ID, NAME & SALARY of some employees from a given text file. Using fread() function?
11. Write a C program to show use of DMA function?
12. Write a C program to show use of initgraph() function?
13. Write a C program to show use of line() and circle() function?
14. Write a C program to show use of rectangle() and drawpoly() function?
15. Write a C program to show use of a Macro without Arguments?
16. Write a C program to show use of a Macro with Arguments?
17. Write a C program to show use of Conditional Compilation Directives?
18. Write a C program to show use of int86() function?
19. Write a C program to show use of intdos() function?
20. Write a C program to create and delete a Directory ?

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2BCACCC5- DATA STRUCTURE

Credit:6 (L:T:P 4:0:2)

Course Objectives

This course will help students to :

- Understand the concepts of data structures and algorithm design methods impacts the performance of programs.
- Choose the appropriate data structure
- Solve problems using data structures such as Arrays, Linked Lists, Stacks, Queues, Hash Tables, Trees, Heaps and Graphs and writing programs for these solutions.
- Solve problems of Searching and Sorting.

UNIT - I

The Concept of Data Structure, Abstract Data Type, Concept of List & Array,

Introduction to Stack, Stack as an Abstract Data Type, Primitive Operation on Stack, Stack's Application - Infix, Postfix, Prefix and Recursion. Introduction to Queues, Primitive Operations on Queues, Queue as an Abstract Data type, Circular Queue, Dequeue, Priority Queue, Applications of Queue.

UNIT - II

Linked List - Introduction to Linked List, Memory Representation of Linked List, Operations on Linked List, Linked List Representation of Stack and Queue, Header Nodes. Types of Linked List - Doubly Linked List, Circular Linked List, Application of Linked List.

UNIT – III

Trees - Basic Terminology of Trees, Binary Trees, Tree Representations as Array & Linked List. Binary Tree Representation. Traversal of Binary Trees - Inorder, Preorder & Postorder, Application of Binary Tree, Threaded Binary tree, Height Balanced tree, B-tree.

UNIT - IV

Analysis of Algorithm, Complexity with Big'O' Notation. Searching - Sequential Search, Binary Search and their Comparison. Sorting - External & Internal Sorting, Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Comparison of Sorting Methods.

UNIT - V

Graphs - Introduction to Graphs, Basic Terminology, Directed, Undirected & Weighted graph, Representation of Graphs, Graph Traversals - Depth First & Breadth First

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Search. Spanning Trees, Minimum Spanning Tree, Applications of Graphs : Shortest Path Problem using Dijkstra Method.

Expected Outcomes

At the end of this course,

- A student will be able to develop efficient C Program using Data Structures.
- A student will be able to use various Data Structures. such as Arrays, Linked Lists, Stacks, Queues, Hash Tables, Trees, Heaps and Graphs.
- A student will be able to use various Searching Methods in their programs.
- A student will be able to use various Sorting Methods in their programs.
- A student will be able to develop and analyze Algorithms and calculate their Complexities.

Text Books:

- Lipschuists, "Data Structure", Schaum 'S Outline Series, Mcgraw Hill Publication
- Ellis Horowitz And Sartaj Sawhney, "Fundamentals Of Computer Algorithm"

Reference Books :

- T Rembley & Sorrenson, " Data Structure"
- S. Sawhnev & E. Horowitz, " Fundamentals Of Data Structure"
- T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein-"Introduction to Algorithms", 3rd Edition, PHI, 2009.
- Sarabasse & A.V. Gelder, "Computer Algorithm –Introduction to Design and Analysis", 3rd Edition, Pearson Publications, 1999.
- Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning, 2012.
- Sartaj Sahni, "Data Structures, Algorithms and Applications in C++", Second Edition, Universities Press, 2011.
- Aaron M. Tenenbaum, Moshe J. Augenstein, YedidyahLangsam, "Data Structures Using C and C++", Second edition, PHI, 2009.
- Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
- D.S Malik, "Data Structure using C++", Second edition, Cengage Learning, 2010.

Data Structure Lab :

List of Practical :

1. Program to maintain a Linked List.
2. Program to add a new node to the asscending order Linked List.
3. Program to maintain a Doubly Linked List.
4. Program to implement Stack as an Array.
5. Program to implement Stack as a Linked List.

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6. Program to convert an A.E. from Infix form to Postfix form.
7. Program to evaluate an Expression entered in Postfix form.
8. Program to Implement Non-Recursive function for Factorial of a Number.
9. Program to Implement Recursive function for Factorial of a Number.
10. Program to implement a Queue as an Array.
11. Program to implement a Queue as a Linked List.
12. Program to implement a Circular Queue as an Array.
13. Program to implement a Circular Queue as a Linked List.
14. Program to implement a Deque using an Array.
15. Program to implement Linear Search in an unsorted Array.
16. Program to implement Binary Search in a sorted Array.
17. Program to implement Selection Sort.
18. Program to implement Insertion Sort (The program should report the number of comparisons).
19. Program to implement Bubble Sort.
20. Program to implement Quick Sort.

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2BCACCC6- DIGITAL ELECTRONICS

Credit:6 (L:T:P 4:2:0)

Course Objectives

The purpose of this course is to

- Provide the basic knowledge of Digital Electronics
- Understand computer building blocks.
- Understand data representation, Boolean gates, Combinational and sequential circuits.

UNIT-I

Data representation Data Types and Number Systems, Binary Number System, Octal &Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers.

UNIT–II

Boolean algebra and digital logic circuits -Logic Gates, AND, OR, NOT,, NOR, NAND & XOR Gates and their Truth Tables, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem, Minimization Techniques, K Map – Two, Three and More Variables maps, Sum of Product & Product of Sums, Don't care conditions.

UNIT–III

Combination Circuits - Half adder & Full adder, Full Subtractor, Full Subtractor and decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Decimal adder, decoders, Multiplexers and Demultiplexers.

UNIT–IV

Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with equations.

UNIT–V

Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Inter-register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional Control Statement, Instruction Codes, Processor organization, design of a simple computer.

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Expected Outcomes

At the end of this course, a student will have

- Knowledge of Digital Electronics
- Knowledge of basic building blocks of the Digital Computer.

TEXT & REFERENCE BOOKS:

- Digital Logic And Computer Design By Morris Mano
- Computer System Architecture By Morris Mano

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2BCAAEC2- ENVIRONMENTAL STUDIES

Credit:3 (L:T:P 3:0:0)

UNIT-I

The Multidisciplinary nature of environmental studies and Natural resources.

Definition; Scope and importance, Need for public awareness. Natural resources and associated problems. Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT-II

Ecosystems, Biodiversity and its Conservation

Concept, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in the ecosystem, ecological succession, food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Biodiversity introduction-Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, biodiversity at global, national and local levels, India as a mega-diversity nation, Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT-III

Environmental Pollution

Definitions. Causes, effects and control measures of:

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(a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution

(e) Noise pollution (f) Thermal pollution (g) Nuclear hazards.

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides.

UNIT-IV

Social Issues and the Environment

From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation, Consumerism and waste products. Environment Protection Act- Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act.- Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness.

UNIT-V

Human Population and the Environment

Population growth, variation among nations. Population explosion-Family welfare Programme. Environment and human health, Human Rights, Value Education, HIV/AIDS, Women and Child Welfare. Role of information Technology in Environment and human health, Case Studies.

Field Work (Practical) 6 hrs = 3 Lectures

- Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain.
- Visit to a local polluted site- Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc.

Text & Reference Book

- Environmental Studies For Undergraduate Courses - UGC e-Text book by Erach Bharucha available at http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

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2BCAOE2 - OPEN ELECTIVE

Choose form the list given from this department or from other department

Credit:3

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SEMESTER - III

3BCACCC7- OBJECT ORIENTED PROGRAMMING WITH C++

Credit:6 (L:T:P 4:0:2)

Course Objectives

C++ a very powerful general purpose programming language, which supports object oriented programming paradigm. This course covers basics of C++programming language and also object oriented features. With the course the student must learn about constructing programs using Bottom-up design approach, gain knowledge and Practice oops concepts objects, Class, Data Abstraction, Encapsulation, Inheritance, Polymorphism and Dynamic Binding. The course also creates a platform to learn Java.

UNIT - I

Object Oriented Programming, Concepts, Advantages, Usage. C++ Environment: Program Development Environment,C++ language standards. Introduction to Various C++Compilers, C++ Standard Libraries, Prototype of main() Function, Datatypes. Classes & Objects- Classes, Structure & classes, Union & Classes, Friend Function, Friend Classes, Inline Function,, Scope Resolution Operator, Static Class Members, Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment.

UNIT - II

Array, Pointers References & The Dynamic Allocation operators Array of objects, Pointers to Object, Type Checking C++ Pointers, The This pointer, Pointer to Derived Types, Pointer to Class Members, Reference parameter, Passing references to Objects, Returning Reference, Independent Reference, 'C++ 'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects.

UNIT - III

Constructor & Destructor - Introduction, Constructor, Parameterized constructor, Multiple Constructor in a class, Constructor with Default Argument, Copy Constructor, Default Argument, Destructor, Function & Operator Overloading Function Overloading, Overloading Constructor Function Finding the address of an Overloaded Function.

UNIT-IV

Operator Overloading: Creating a member, Operator Function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=,-=~., etc), Operator overloading restriction, Operator overloading using friend function, Overloading New & Delete, Overloading some special operators, Overloading [ ], ( ),-, comma operator, Overloading <<.

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UNIT-V (15)

Inheritance -Base Class Access Control, Protected Members, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function, Passing parameters to base class constructors, Granting access, Virtual base classes. Virtual functions & Polymorphism: Virtual function, Pure Virtual functions, Early vs. Late binding.

Expected Outcomes

- After learning the course the students should be able to Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism.
- Write the skeleton of C++ program.
- Write the simple C++ programs using the variables, operators, control structures, function s and I/O objects cin and cout
- Write the simple object oriented programs in C++ using objects and classes.
- Use features of C++ like type conversion, inheritance, polymorphism to develop programs for real life problems.
- Use standard template library for faster development. Develop the applications using object oriented programming with C++.

Text & Reference Books:

- Herbertz Shield, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
- R. Subburaj, 'Object Oriented Programming With C++ Vikas Publishing House, New Delhi.Isbn 81-259-1450-1
- E. Balgur Uswamy, "C++ " TMH Publication ISBN O-07-462038-X
- M. Kumar 'Programming In C++" TMH Publications
- R. Lafore, 'Object Oriented Programming C++"
- Ashok . N. Kamthane, "Object Oriented Programming With ANSi & Turbo C++ ", Pearson Education Publication,ISBN-8j-7808-772-3

List of Practical

1. Write a program that Just outputs `Hello, World
2. Write a program that Output value as number and as character
3. Implementation of the function that calculates the cross sum of an integer
4. Determine number of characters in a string
5. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power ( ) that takes a double value for n and an int value for p, and returns the result as double value. Use a default argument of 2 for p, so

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that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test this function.

6. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates.
7. Write a program that uses a structure called point to model a point. Define three points, and have the user input values to two of them. Than set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:

   Enter coordinates for P1: 3 4

   Enter coordinates for P2: 5 7

   Coordinates of P1 + P2 are : 8, 11
8. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be Y or N . Some sample interaction with the program might look like this.

   Enter first number, operator, second number: 10/ 3

   Answer = 3.333333

   Do another (Y/ N)? Y

   Enter first number, operator, second number 12 + 100

   Answer = 112

   Do another (Y/ N) ? N
9. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:

   Enter your area code, exchange, and number: 415 555 1212

   My number is (212) 767-8900

   Your number is (415) 555-1212
10. Create two classes DM and DB which store the value of distances. DM stores distances in meters and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe a DM object or DB object, depending on the units in which the results are required.The display should be in the format of feet and inches or metres and cenitmetres depending on the object on display.

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11. Create a class rational which represents a numerical value by two double values-NUMERATOR & DENOMINATOR. Include the following public member Functions: constructor with no arguments (default). constructor with two arguments.
    void reduce( ) that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
    Overload + operator to add two rational number.
    Overload >> operator to enable input through cin.
    Overload << operator to enable output through cout.
    Write a main ( ) to test all the functions in the class.
12. Consider the following class definition
    class father {
    protected : int age;
    public;
    father (int x) {age = x;}
    virtual void iam ( )
    { cout < < I AM THE FATHER, my age is : << age<< end1:}
    };
    Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar but appropriate messages. You should also define suitabl constructors for these classes.
    Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.
13. Make a class Employee with a name and salary. Make a class Manager inherit from Employee. Add an instance variable, named department, of type string. Supply a method to string that prints the manager s name, department and salary. Make a class Executive inherit from Manager. Supply a method to String that prints the string Executive followed by the information stored in the Manager superclass object.Supply a test program that tests these classes and methods.
14. Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals.Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC kay should cause the program to print out the total cars and total cash and then exit.
15. Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit ( ) as an argument. Write a program to exercise reversit ( ). The program should get a string from the user, call reversit ( ), and print out the result. Use an input method that allows

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embedded blanks. Test the program with Napoleon s famous phrase, Able was I ere I saw Elba) .

16. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data ( ) to initialize base class data members and another member function display_area ( ) to compute and display the area of figures. Make display_area ( ) as a virtual function and redefine this function in the derived classes to suit their requirements.Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

    Area of rectangle = x * y

    Area of triangle = ½ * x * y

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3BCACCC8- COMPUTER NETWORKS

Credit:6 (L:T:P 4:2:0)

Course Objectives

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain knowledge of basic network design and maintenance.

UNIT - I

Basic Concepts: Network Definition, Components of Data Communication, Distributed Processing, Topology, Transmission Mode, Categories of Networks. OSI and TCP/IP Models: Layers and Their Functions, Comparison of Models. Digital Transmission: Modems, Modems, Cable Modems. Analog and Digital Signal; Data-Rate and limits; Digital to Digital Line Encoding Schemes; Parallel and Serial Transmission; Modulation Scheme, Multiplexing Techniques FDM, TDM, Transmission Media.

UNIT - II

Networks Switching Techniques and Access Mechanisms , Circuit Switching; Packet Switching, Message Switching, Connection-Oriented Virtual Circuit Switching; Dial-Up Modems; Digital Subscriber, Data Link Layer Functions and Protocol, Error Detection and Error Correction Techniques, Data -Link Control Framing and Flow Control , Error Recovery Protocols - Stop and Wait ARQ, Go-Back-N ARQ; Point to Point Protocol.

UNIT - III

Multiple Access Protocol and Networks, ALOHA, SLOTTED ALOHA , CSMA/CD, Protocols; Ethernet LANS, Token Ring Token Bus , Back-Bone Networks, Network Adapters Cards , Repeaters, Hubs, Switches, Bridges, Types of Bridges, Router and Gateways,

UNIT - IV

Networks Layer Functions and Protocols , Routing : Routing Algorithms Distance Vector Routing; Shortest Path Routing, Network Layer Protocol, IP Protocol, Internet Control Protocols. Unicasting, Multicating, Broadcasting, ISDN: Services, Historical Outline, PRI ,BRI.

UNIT - V

Transport Layer Functions and Protocols, Overview of TCP and UDP, Transport Services Error and Flow Control, Connection Establishment and Release, Three Way Handshake, Overview of Session Layer and Presentation Layer , Overview of Application Layer

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Protocol Overview of DNS Protocol, Ooverview of Internet, WWW ,HTTP, FTP, SNMP Protocol. Internet Services, Email Services , WWW Services, Serach Service etc.

Expected Outcomes

- Understand Computer Network Technology and different types of network topologies and protocols..
- Understand and explain Data Communications System and its components.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Identify the different types of network devices and their functions within a network.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

TEXT BOOKS

- B. A. Forouzan: Data Communications and Networking, Fourth edition, THM ,
- A. S. Tanenbaum: Computer Networks , Fourth edition PHI.

Reference Books

- Ames Chews Charles Perkins, Matthew Strebe "Networking Essentials:Study Guide"MCSE BPB Publications.
- K.Basandra & S. Jaiswal "Local Area Network" Galgotia Publications
- William Stalling "Data and Computer Communication" 8/E Pearson Prentice Hall
- Prakash C Gupta " Data Communication and Computer Network " PHI

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3BCACCE(A) - MANAGEMENT THEORY & PRACTICES

Credit:3 (L:T:P 4:2:0)

Course Objectivess

The Objective of the course is to :

- To create an understanding on basic Principles, concepts & Functions of Management.
- To Explain the Key Competencies and skills required for Problem-solving & Decision-making in managerial situations.
- To Illustrate about the different organisational designs and structures.
- To develop a conceptual understanding on Materials, Operations & Marketing management.
- To create an understanding about SWOT Analysis and how it helps to generate alternative corporate strategies.
- To develop an understanding about the role and functions performed by the HR managers .

UNIT - I

Management basics What is management, the history of management, Types of manager, manager qualities. Management responsibilities, management tasks and functions. The business environment defining the organization, organization structure, the quality organization, organizational changes, Centralization and Decentralization, managing changes. Management obligations, social and professional responsibilities, government regulations.

UNIT – II

Strategy formulation the elements of strategy, the strategy formulation process, alliances and acquisitions, strategy formulation tools and Techniques, plan implementation. Decision making the nature of management decision, the decision making Process, decision making techniques.

UNIT – III

Information presentation and reporting - Principle, Type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information, flow of information. Brief introduction to project planning and management and its tools/ techniques-Gantt chart, PERT/CPM. Human Resources management: Concepts & functions, Job analysis and role description.

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UNIT – IV

Management skills: Leadership and motivation The nature of leadership, leadership theories, Delegation, motivation and motivation theories, need of motivation, motivation techniques. Team building Defining and effective team, selecting team members, building teams, training and development. Effective communication The communication process, presentation skills Tools and techniques.

UNIT-V

Time management - Importance of time, characteristics of management Tasks, determining time elements, time management techniques. Entrepreneurship Entrepreneur and its role, how to become an Entrepreneur, essentials steps to become an entrepreneur, EDP training.

Course Outcomes

At the End of the course the student will be able to:

- Identify the Managerial skills needed for managing a Unit / Branch
- Define and describe the different operations / functional areas in an organisation
- Assess the situation's by critical examination and provide a better decisions for the organization.
- Forecast the dynamics of business and sense & formulate the direction of change.

TEXT & REFERENCE BOOKS:

- S.K. Basandra, "Computers Today", Galgotia Publications
- Mazda, Engineering Management, Addisen Wesley
- Koontz H, "Essentials Of Management", TMH Publications

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3BCACCE(B) - DISCRETE MATHEMATICS

Credit:3 (L:T:P 4:2:0)

Course Objectives

- Study Discrete mathematics, is to study of mathematical structure that are fundamentally discrete, in the sense of not supporting notion of continuity.
- A study of discrete sets has objective to understand many application of Computer Science and various areas of engineering.
- This course is designed to give basic concepts of propositions, predicates, Boolean algebra, logic.
- To study or express objects or problems in computer algorithm and programming languages.
- To improve the efficiency of a computer programs, we need to study its logical structure, which involves a finite number of steps each requiring a certain amount of time.
- Using the theory of combinatory and graph theory, major areas of discrete mathematics.
- Study of areas those would complement and improve the understanding of courses based on algorithm and problem solving.

UNIT - I

Sets & proposition - Introduction, combinations of sets, finite and infinite sets, unacceptable indefinite sets, principles of inclusion and exclusion, Propositional Logic: Proposition , well formed formula , Truth tables , Tautology , Satisfiability Contradiction , Algebra of proposition , Theory of Inference , Predicate Logic: First order predicate, well formed formula of predicate , quantifiers , Inference theory of predicate logic.

UNIT - II

Relations and functions– introduction, a relation model for database . Properties of binary relations. Equivalence relations and lattices, partial ordering relations and lattices .

Recurrence relations and recursive algorithm-Introduction, Recurrence, Relations, Linear Recurrence With Coefficient Solutions, particular solutions, Total Solutions.

UNIT - III

Groups and ring-Groups and Subgroups, Generators and Evaluations of Powers, Cosets and Lagrange Theorem, Permutation, Groups and Codes, Isomorphism and Automorphisms, Homomorphism and Normal Groups, Rings, Integral Domains and Fields, Polynomial Ring and Cyclic Codes.

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Boolean algebra's-Lattices and Algebraic System, Principles of Duality, Basic Properties of Algebra's of System, Defined by Lattices, Distributive and Complemented Lattices, Boolean Lattices and Boolean Algebra's . Uniqueness Finite Boolean Algebra's . Boolean Functions and Boolean Expressions.

UNIT - V

Finite state machines-Introduction, Finite State Machines, Finite State Machine as Model of Physical System, Equivalent Machines, Finite State Machine as Language Recognizers.

Expected Outcomes

- Understand and practice Fundamental Concepts and Terminology of Discrete Structures.
- Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, functions, and integers.
- Evaluate elementary mathematical arguments and identify fallacious reasoning (not just fallacious conclusions).
- Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.
- Apply the method of invariants and well-founded ordering to prove correctness and termination of processes and state machines.

TEXTS & REFERENCE BOOKS:

- Elements Of Discrete Mathematics By C.L.Liu–Mcgraw–Hills Pub.
- Applied Discrete Structure For Computer Science By Alan Doerr And Kenneth Levassur-Galgotia Publication
- Liu And Mohapatra, "Elements Of Distcrete Mathematics", Mcgraw Hill
- Jean Paul Trembley, R Manohar, Discrete Mathematical Structures With Application To Computer Science, Mcgraw-Hill
- R.P. Grimaldi, Discrete And Combinatorial Mathematics, Addison Wesley,
- Kenneth H. Rosen, Discrete Mathematics And Its Applications, Mcgraw-Hill,
- B. Kolman, R.C. Busby, And S.C. Ross, Discrete Mathematical Structures, Phi

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3BCASEC1 - COMPUTER HARDWARE MAINTENANCE AND TROUBLESHOOTING

Credit:3 (L:T:P 2:0:1)

Course Objectives

This course is focused on developing skills in installation and configuration of Operating systems, loading and configuring various device drivers, diagnosing the faults and troubleshoots the computer at software level as well as component level. This course will be helpful for students to get employment in the computer maintenance industry as well as self-employment.

Aims to develop required skills in students so that they are able to acquire following competency:

- Identify faults, troubleshoot, repair and do preventive maintenance of computer system and its peripherals.

UNIT – I

Inside the PC: Core Components

- Identify different type and generation of computer, Identify devices required for using laptops, Identify components which makes the system and specify its importance. Identify various types of ports and its connecting devices.
- Motherboard: definition, Components/connections in motherboard, functional block diagram
- Central Processing Unit (CPU): CPU Speeds, Word Size, Data Path, Internal Cache memory, Slots and sockets, CISC vs RISC processor, CPU chips preprocessors motherboard Types/Form Factors (AT, Baby AT, ATX, LPX, NLX, BTX)
- Expansion Buses (Definition, Bus Architecture (PC/PC-XT, PC-AT/ISA, EISA, MCA, VESA Local (VL) Bus, PCI, Combination of Bus Systems, AGP – Accelerated Graphics Port, Universal Serial Bus (USB), IEEE 1394 Fire Wire- A Bus Standard
- System Controller : Definition
- Basic Input Output System :Services, Bios Interaction, CMOS-RAM
- Chipsets : Definition, Advantage, North and South Bridge
- System Memory : definition, memory sizes, speeds and shapes (DIP, ZIP, SIPP, SIMM, DIMM, RIMM), Memory modules (Dynamic RAM, SDRAM, DDR SDRAM, SLDRAM, DRDRAM, Fast Page Mode (FPM) DRAM, Extended Data Out(EDO) DRAM)

UNIT– II

Hard Disk Drive and Controller, DVD Drives

- Disk Basics
- Hard Disk Interfaces: EIDE, Serial ATA, SCSI, USB and IEEE 1394 (Firewire), RAID, Solid State Drive (laptop)
- Disk Geometry : Heads, Tracks, Sectors, Cylinders, Cluster, Landing zone, MBR, Zone bit recording

- Disk performance Characteristics: Seeks and Latency, Data Transfer Rate
- Hard Disk Controller: Functional Blocks, HDC Functions
- DVD Drives : Types, Recording, Construction, Interfacing,
- DVD Drive Performance Criteria : Data Transfer Rate, Access time, Cache/buffer
- Blu-ray disk specification

UNIT– III

Input Devices and Printers

- Keyboard : Keyboard operation, Keyboard Types , Types of Key switches (Membrane, mechanical, rubber dome, capacitive)
- Keyboard interfaces
- Mouse : Types, Operation, Interfaces
- Scanner : Scanner Types, Image quality measurement, Working
- Types of Printers
- Printer Interfaces
- Ink-jet Printer : Parts, working principle
- LaserJet Printer : Parts, working principle

UNIT– IV

Monitor and Display Adapters

- Video Basics (CRT parameters)
- VGA monitors
- Digital Display Technology- Thin Displays, Liquid Crystal Displays, Plasma Displays, Light Emitting Displays
- Graphics Cards : Components of a card, Accelerated Video cards, CGA, EGA, VGA

UNIT– V

Trouble Shooting and Preventive Maintenance

- POST : Functions, IPL Hardware, Test Sequence, Error messages
- Troubleshooting : possible problems and diagnosis
  - Motherboard
  - Keyboard
  - Hard Disk Drive
  - Printer
- Preventive maintenance tools

Expected Outcomes

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

i. Install, configure Operating Systems and device drivers.
ii. Install, configure and maintain various components in computer system and peripheral devices.
iii. Diagnose faults, repair and maintain computer system and its peripherals.

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SUGGESTED LIST OF EXERCISES/ PRACTICALS

S. No.	Unit No.	**Practical Exercises** (Outcomes' in Psychomotor Domain)	**Hrs. required**
1	I	Identify basic components of a personal computer. Prepare a list of various computer peripherals. (e.g. CPU, Monitor, Keyboard, Mouse, Speaker, Web cam, Printer, Scanner, microphone, speakers, modem, projector etc).	01
2	I	Identify common ports, associated cables, and their connectors. Observe various connectors, ports back and front side of the computer. Write their purpose and specifications. (e.g. Power, PS/2 keyboard and mouse, Serial and parallel, USB, VGA, LAN, Audio & microphone, Firewire, HDMI, games, SATA etc.)	01
3	I	Identify major components including motherboards, memory, drives, peripheral cards and devices, BIOS, and Windows operating system. Observe the various components on the motherboard, identify it. Also observe their interconnection and arrangement inside the case. Detach and attach the cables and component in the PC case and motherboard. Carryout detailed study on all the components and devices on the given motherboard. • Processor socket ,Chipsets, • Memory module slots, BIOS, CMOS • FDD, HDD connectors • Different types of expansion slots (ISA, EISA, PCI, PCI express, AGP, Express Card & PC Card (or PCMCIA) etc.) • Add-on-cards (audio, graphics, I/O, TV tuner, network etc.) • Cables in a computer system (IDE Ribbon cable, SATA cable etc) • Connections for button, indicator lights etc. • Observe various types of memory modules (SIMM, DIMM, SO-DIMM, RIMM, SO-RIMM). Also observe impact of removal of memory modules from the system, start it and re insert memory module and restart system. • Disassemble the PC carefully. Assemble the same PC you have disassembled and boot the system. Observe the procedure of assembling a computer system.	02

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4	I	Observe the different types of motherboards, form factors and write the difference between the desktop motherboard and laptop motherboard, all in one desktop motherboard, server motherboard. (e.g Full size AT, baby AT, ATX, LPX, NLX etc)	02
5	I	Identify the on-board features of the motherboard. Add additional facilities like the network capabilities, and gaming capabilities by adding an Accelerator card. Install the given driver and test the computer for proper functioning. Remove the drivers for some devices like sound, display, network etc. and again install them and check the proper functioning of computer. Upgrade the given PC by adding RAM and additional Hard Disk.	02
6	II	Observe, search and write the specifications of CD/DVD	Homework
		drive, HDD, motherboard, RAM chips, Power supply, Microprocessor chip, Add on cards. Prepare complete specifications of the latest system configuration available in the market.	
7	II	Observe the power supply (SMPS) and measure their voltage levels of a given SMPS. Measure various voltage levels, such as motherboard, storage devices and fan etc. using multi-meter. Do a detailed study on all the components and devices on the given power supply. Observe different types of switch mode Power Supply – AT, ATX, NLX . Record the different types of power connectors on the motherboard.	02
8	II	Observe various secondary storage systems- Hard Disk, Flash drives, CD/ DVD drive. Open drives and draw the internal structure of them. (If available Also open the various FDD/HDD disks to observe the magnetic disk inside.)	02
9	II	Observe the various techniques for low level and high level formatting of Hard Disk. Format the given Hard Disk using any one technique and create three partitions, two for operation systems and one for data.	01
10	II	Observe the procedure for installing Operating System like win7/win8 with partition formatted in previous practical in one partition, (fat, fat16, fat32, ntfs, gpt). Try booting PC. Learn the content of boot.ini after the installation process. Now install unix Operating System like Linux /Ubantu/ centos/ fedora/ red hat in another partition. Create dual booting system try booting PC. Learn the content of boot.ini after the installation process.	02

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11	III	Open at least 2 to 3 different types of keyboard and mouse and observe the internal circuits. Observe and write steps to troubleshoot, maintain and clean the diskette drives, keyboard, mouse, etc.	02
12	III	Observe different types of printers (dot matrix, inkjet & laser, multifunction). Install driver and interface the printers with PC/Laptop on any operating system (connect the printer to one PC directly using USB/Serial/Parallel ports as per the availability; test the functioning of the printer.) Write detailed comparative analysis of different types of printer available in the market and suggest a printer with good features and best price as per need. Justify your printer selection.	02
13	III	Observe the interfacing, installation and working of various devices such as scanner, projector, web cam etc. Connect all these devices with the given PC, install & test them.	02
14	V	Identify BIOS settings. (strictly under the observation of Instructor) ▪ Define BIOS. ▪ Demonstrate starting BIOS. ▪ Identify how to disable unused devices to decrease	02
		Security risks. □ Change booting of computer with different secondary storage CD, HDD, USB etc.	
15	V	Identify the problem in the given PC, using the given troubleshooting sequence, fix the issue, record the given problem, and produce proper documentation of your work	02

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16	V	Recognize common symptoms associated with diagnosing and troubleshooting PCs and utilize Windows built-in diagnostic tools. Identify general troubleshooting techniques and strategies Utilize scandisk, control panel, boot-up menu, and startup disk as diagnostic tools. Access Microsoft Knowledge Base on the Internet to solve common problems. Identify the common problems associated with shutdown, configuration, and cabling. Identify problems associated with heating and cooling of the internal components. Identify problems with installing internal devices such as hard drive, tape drives, or CD-ROM drive. Recognize and interpret the meaning of common error codes and startup messages. Recognize windows-specific printing problems and corrections.	02
17	V	Log boot ups and events. ▪ Describe the purpose of logging system events. ▪ Correlate an event with a job and session. ▪ Describe how the SLOG command enables and disables the selected system logging events. Define registry file operation and maintenance. ▪ Describe registry file operations. ▪ Demonstrate proper registry file maintenance practices. ▪ Demonstrate how to remove unwanted software applications.	02
18	V	Search for various data recovery software apply on pen drive/HDD.	02
19	V	Perform computer maintenance and preventative maintenance functions. • Perform physical cleaning (internal and external) of personal computer. • Demonstrate how to adjust basic performance settings. • Perform hard drive file system maintenance. • Identify anti-virus software and applications. • Identify diagnostic software such as Norton Utilities. (Discuss the system maintenance & troubleshooting. Create policies, quality check forms and create a standard	02

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		procedure to reduce the maintenance job. Conduct the Preventive maintenance and troubleshooting of repaired PCs in the laboratories, create detailed plan to conduct the work in the stipulated time. Create a detailed report of your work.)	
20	V	Utilize Internet to download device drivers. Installation of drivers of various devices from the internet.	02
21	V	Demonstrate to remove unwanted software applications.	01
22	V	Operate and maintain registry file . □ Describe registry file operations. & demonstrate proper registry file maintenance practices.	02
23	V	Log boot ups and events. • Describe the purpose of logging system events. • Correlate an event with a job and session. • Describe how the SLOG command enables and disables the selected system logging events.	02
Total (practical for 28 hours from above representing each unit may be selected)			**42**

Text & Reference Books

- Computer Installation and Servicing, D Balasubramanian, Tata McGraw Hill Education Private Limited
- The complete PC Upgrade & Maintenance Guide, Mark Minasi, BPB Publications
- IBM PC and clones, Govind Rajalu, Tata McGraw Hill Education Private Limited

3BCAOE3- OPEN ELECTIVE

Choose form the list given from this department or from other department

Credit:3

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SEMESTER - IV

4BCACCC9 - JAVA PROGRAMMING

Credit:6 (L:T:P 4:0:2)

Course Objectives

The purpose of this course is to

- Be able to use the Java SDK environment to create, debug and run simple Java programs.
- Understand fundamentals of Java Programming such as Character Set, Variables, Data Types, Conditional and Iterative Execution, Methods, etc.
- Understand fundamentals of Object-Oriented Programming(OOP) in Java, including defining classes, invoking methods, using class libraries, etc.
- Be able to create and use Arrays and Threads in Java.
- Be able to create Java Applets.

UNIT - I

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JAVA virtual machine, Constants & Variables, Data Types, Type Casting, Operators , Expressions & its Evaluation, Decision making and branching, Loops, Jumps in Loops, Labeled Loops.

UNIT - II

Defining a class, Adding variables and methods, Creating objects, Accessing class members, Constructors, Method overloading , Static members, Nesting of methods, Inheritance: Extending a class, Overriding methods, Final variables and method~, Final classes, Finalizes methods, Abstract methods and classes, Visibility control.

UNIT - III

Arrays, One dimensional & two dimensional, Strings, Vectors, Wrapper classes, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using system packages, Naming conventions, Creating packages, Accessing a package, Using package, Adding a class to a package, Hiding classes.

UNIT - IV

Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing the runnable Interface.

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UNIT - V

Applets, Local and remote applets, Applets Vs applications, Writing applets, Applets life cycle, Creating an executable applet, Designing a web page, Applet tag, Adding applet to HTML file, Running the applet, Passing parameters to applets, Aligning the display, HTML tags & applets, Getting input from the user interface.

Expected Outcomes

At the end of this course,

- A student will have Good knowledge Java Programming Language.
- A student will have the knowledge of fundamentals of OOPs in Java.
- A student will be able to use Java Tools of JDK and vast Java Standard Library to develop Java Programs.
- A student will be able to apply his programming knowledge to develop Java Programs using Control Structures, Classes, Interfaces, Arrays, Strings, Vectors, Java Threads etc.
- A student will be able to develop Java Applets.

Text Books:

- E Balagurusamy , "Programming with JAVA", TMH Publications
- Herbert Schildt ,"Java 7, The Complete Reference", 8th Edition, 2009.

Text & Reference Books:

- YASHWANT KANETKAR , "LET US JAVA", BPB PUBLICATIONS
- Ivan Bayross, "Web Enabled Commercial Application Development Using Html, Dhtml,javascript, Perl Cgi" , BPB Publications, 2009.
- Cay Horstmann, "BIG Java", 3rd Edition., Wiley Publication , 2009
- Peter Norton, "Java Programming", Techmedia Publications.

Java Programming Lab

List of Practical:

1. Write a program to find the largest of n natural numbers.
2. Write a program to find whether a given number is prime or not.
3. Write a menu driven program for following:
   a. Compute Factorial of a number
   b. Check whether a given number is odd or even.
   c. Check whether a given string is Palindrome or not.
4. Write a program to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers

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are equal to the number passed, how many are greater and how many are less than the number passed.

6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
8. Write java program for the following matrix operations:
   a) Addition of two matrices
   b) Multiplication of two matrices
   c) Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a triangle using function overloading.
10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
12. Write a java program to draw a line between two coordinates in a window.
13. Write a java program to display the following graphics in an applet window.
   a) Rectangles
   b) Circles
   c) Ellipses
   d) Arcs
   e) Polygons
14. Write a program for the following string operations:
   a) Compare two strings
   b) Concatenate two strings
   c) Compute length of a string
15. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.
16. Write a program to Display Fibonacci series.

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4BCACCC10 – OPERATING SYSTEMS

Credit:6 (L:T:P 4:2:0)

Course Objectives

The purpose of this course is to

- Understand the types and services of an operating system.
- Understand processes scheduling and synchronization.
- Understand different approaches to memory management.
- Understand the concept of Disk Scheduling & Disk Management.
- Understand the structure and organization of the file & Directory system.

UNIT - I

Operating Systems - Definitions, functions, Types of operating system - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, components, Operating system Services, System Calls, programs, System structure.

UNIT – II

Process Management - Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling, Real-Time Scheduling, Threads,

UNIT – III

Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock .

UNIT – IV

Memory Management - Logical versus physical address space, Contiguous Allocation, Fixed Partition, Variable Partition, Swapping, Paging, Segmentation, Virtual Memory, Demand Paging, Page Replacement, Page Replacement Algorithms,

UNIT – V

Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation. File Concepts, Directory structure, Protection

Expected Outcomes

At the end of this course,

- The student will Understand the basic concepts of operating system its types and services

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- The student will Understand the concept of Process Management and its Scheduling
- The student will Understand the concept of process Synchronization and Deadlock
- The student will Understand the concept Memory Management Techniques
- The student will Understand the concept Disk and file Management

TEXT & REFERENCE BOOKS:

- Operating system concepts by Silberschatz, Galvin, Gagne, Wiley Student Edition
- Operating system concepts & design by Milan Milenkovic, TMH publication

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4BCACCE(A) - SYSTEM ANALYSIS & DESIGN

Credit:6 (L:T:P 4:2:0)

Course Objectives

The purpose of this course is to

- Introduce established and evolving methodologies for the analysis, design, and development of an information system.
- Understand system characteristics, managing projects, prototyping.
- Understand and plan systems development life cycle phases.
- Analyze a programming problem and design an appropriate solution using a combination of tools and techniques.

UNIT - I

System Concept: Definition, Features of a System,Characteristics of a System, Types of Systems, Elements of System, Physical and abstract system, Open and Closed system, ,System Development Life Cycle: Various phases of system development, Structured Analysis and Design, Object Oriented Analysis and Design, The Role of System Analyst, What System Analyst Does?, Attributes of an Effective Systems Analyst, Types of Information, Qualities of Information, Information System, Transaction Processing System ,Management Information System, Decision Support systems, Executive Information System, Expert System, Office Automation Systems, Considerations for system planning and control for system success, System Planning.

UNIT -II

Initial Investigation: Determining Users Requirements and Analysis, Interviews and Its Types, Questionnaires and Its Types, Problem Definition Project Initiation,Background Analysis,Review of Written Documents, Fact Finding Process and Techniques. Feasibility Study: Determination of Feasibility Study, Technical, Operational & Economic Feasibilities, Data Analysis, Cost and Benefit Analysis : Tools and techniques Study of PERT and CPM , and Gantt Chart

UNIT -III

Tools of Structured Analysis: Data Dictionary, Form, Gantt Charts, System Model, Pseudo Codes, Flow Chart System Flow Chart, Systems flowcharts and structured charts , Data flow diagrams Decision Tree, Decision Tables, Input/ Output and Form Design: Input and Output Form Design Methodologies, Menu, Screen Design, Layout Consideration. Process modeling, Logical and physical design, Design representation, Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis , Designing the internals: Program and Process design.

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UNIT -IV

User Manual, Programming Manual, Programming Specifications, Operator Manual. System Testing: System Testing and Quality Assurance, Software Maintenance. System Security: Data Security, EDP: Introduction. Job Responsibilities & duties of EDP Personnel's, EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP. Case Study Library Management System and Hospital Management System

UNIT V

Module specifications ,Module coupling and cohesion , Top-down and bottom-up design System Implementation and Maintenance , Conversion methods ,System Audit and Security System evaluation and performance, Testing and validation, Systems quality Control and assurance, Maintenance activities and issues, Types of threats to computer system and control measures: Threat to computer system and control measures, Disaster recovery and contingency planning, Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails

Expected Outcomes

At the end of this course,

- The student will Understand Information System.
- The student will Define and describe the five phases of the system development life cycle.
- The student will understand expected benefits from systems projects.
- The student will Understand and explain information systems requirements.
- The student will Describe how systems analysts interact with users, and management,
- The student will Perform a feasibility study.
- The student will Work as an effective team member on assigned projects.

TEXT BOOKS:

- Elis M.Awad "Systems Analysis and Design" 2nd edition Paper Back ISBN : 9788175156180
- V.K. Jain "System Analysis & Design" Dreamtech Press SBN-8177220799

REFERENCE BOOKS:

- Len Fertuck "System Analysis & Design: With Modern Methods" : Business and Educational Technologies
- V.K.Kapoor "Information Technology & Computer Applications" Sultan Chand & Sons, New Delhi
- A Hoffer, F George, S Valaciah "Modern System Analysis & Design" Low Priced Edition Pearson Education

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4BCACCE(B) - E-COMMERCE & E-GOVERNANCE

Credit:6 (L:T:P 4:2:0)

Course Objectives

- To develop skills in understanding strategic issues related to E- Commerce and E- Governance
- To develop a broad knowledge of E-Governance and E-Commerce activities in India
- To understand the Electronic Payment Systems
- To develop knowledge and confidence in undertaking E-Government initiatives in respective of government offices
- To develop appreciation for the risks and challenges associated with implementing E-Government and knowledge of how to overcome them.
- To develop knowledge of how the government may contribute in moving the country towards E-Commerce.
- To understand E-Government systems security issues and achieve them.

UNIT - I

Introduction to E-commerce: Definition, History of E-commerce, E-business Models B2B, B2C, C2C, C2B, legal; Environment of E-commerce, Dimensions of E-commerce, ethical issues, electronic data interchange, value chain and supply chain, E-commerce Marketings , E-commerce Strategy, E-commerce Infrastructure, Advantages and Disadvantages of e-commerce.

UNIT - II

Electronic Payment Systems: Payment Gateways , Payment Cards , Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, Categories of E-commerce , EDI, Marketing strategies, advertising on the web, customer service and support, Internet Banking , Introduction to m-commerce, case study: e-commerce in passenger air transport, Element of E-commerce , Issues of E-commerce.

UNIT - III

E-Government, theoretical background of e-governance, issues in E-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of E-governance, E-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT - IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e- governance, e-seva. Origins in India E-Governance Projects in India Measures to be considered before going for E-Governance, Workplan and

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Infrastructure. Digital payment initiatives in India, Digital Payment platforms and applications. Use of Aadhar number in digital services.

UNIT - V

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers. E-Security Network and Web Site Risk for E-Business, Information Technology Act 2000 and its Highlights Related to E-commerce, E-Security, Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security, Securities in e-payments.

Expected Outcomes

At the end of this course,

- The student will Understand strategic issues related to E-Commerce and E-Governance
- The student will Understand and develop a broad knowledge of E-Governance and E-Commerce activities in India
- The student will Understand the Electronic Payment Systems
- The student will develop knowledge and confidence in undertaking E-Government initiatives in respective of government offices
- The student will develop appreciation for the risks and challenges associated with implementing E-Government and knowledge of how to overcome them.
- The student will develop knowledge of how the government may contribute in moving the country towards E-Commerce.
- The student will Understand the E-Government systems security issues and achieve them.

TEXT BOOKS

- Amir Manzoor " E-Commerce :An Introduction " Lambert
- Gary P. Schneider, "E-commerce", Cengage Learning India.
- C.S.R. Prabhu, "E-governence: concept and case study", PHI Learning Private Limited.

REFERENCE BOOKS:

- P. Tjoseph, S.J. " E-Commerce an Indian Perspective " Prentice-Hall of India
- V. Rajaraamn, "Essentials of E-Commerce Technology", PHI Learning Private Limited.

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4BCASEC2 - WEB DESIGNING (HTML, CSS, JAVASCRIPT)

Credit:3 (L:T:P 2:0:1)

WEB DESIGNING

Course Objectives

- To understand the concepts of Web Designing from basics.
- To learn HTTP with details for programming for web page design.
- To understand and operate on CSS with Java Script programming.
- To understand Dreamweaver and other tools for Website Designs.
- To Design, edit and style for Accessible Tables.
- To Create Websites With Frames, Scrollbars, Borders, Targeting Links
- To perform Web Hosting with Domains, DNS, web Server.
- To learn basics of FTP.

UNIT - I

Introduction to HTTP, HTML, Basic HTML Tags, Body Tags, Coding Style, Modifying & formatting Text, Lists – Unordered, Ordered, Definition, Insert Links -Linking to another Document, Internal Links, Email Links, Relative and Absolute Links, Insert Images - Referencing Images, Clickable Images, Image Placement and Alignment, Image Size, Image Margins, Image Formats, Image Maps- Defining an Image Map, Advanced Coloring Body Content, Working with tables - Basic Tables, Table Attributes, Table Cell Attributes, Table Row Attributes, Tables Inside of Tables, Invisible Spacers, Working with Frame-Based Pages- Creating Windows, Single Window Frames, Creating Column Frames, Creating Row Frames, Creating Complex Frames.

UNIT - II

Cascading Style Sheet (CSS) – Introduction, creating style, using inline and external CSS, Creating Divs with ID style, Creating Tag& Class style, creating borders, Navigation links, creating effects with CSS.

JavaScript – Introduction, use of JavaScript in webpages. Understand JavaScript event model, use some basic event and control webpage behavior.

UNIT - III

Designing Websites With Dreamweaver/Expression Web/AMAYA/COFEE CUP WYSIWYG HTML Editor - Introduction to WYSIWYG HTML editor, advantages of using HTML editors, Creating a New Site, Creating a New Page, Adding Images with Alternate Text, Inserting & Formatting Text, Aligning Images, Creating an Email Link, Linking to Other Websites, Testing & Targeting Links, Organizing Files & Folders

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Creating & Inserting Images - Optimizing Images for the Web, Saving GIFs & PNGs in Photoshop, Inserting GIFs, Adjusting Transparency Settings, Saving JPGs for the Web

UNIT - IV

Designing Accessible Tables - Understanding Tables & Accessibility, Using Tables for Tabular Data, Styling a Table, Editing Table Layouts,Adding Style to a Table Using CSS

Creating Websites with Frames - Introducing Frames, Creating a Frameset, Opening Pages into Frames, Controlling Scrollbars & Borders, Targeting Links in Frames

UNIT - V

Web Hosting - What is Domain?, Introduction to DNS, How to register a Domain ?, What is web hosting ?, How to get a web hosting ?, Host your website on web Server.

FTP - FTP Introduction, FTP Commands Viewing Files and Directories, FTP Commands Transfer and Rename files, FTP with WS FTP/ CuteFTP, Filezilla on Windows.

Expected Outcomes

At the end of this course:

- The student will understand the concepts of Web Designing from basics.
- The student will learn HTTP with details for programming for web page design.
- The student will understand and operate on CSS with Java Script programming.
- The student will understand Dreamweaver and other tools for Website Designs.
- The student will learn to Design, edit and style for Accessible Tables.
- The student will be able to Create Websites With Frames, Scrollbars, Borders, Targeting Links
- The student will be able to perform Web Hosting with Domains, DNS, web Server.
- The student will learn basics of File transfer, view, rename with different tools.

TEXT & REFERENCE BOOKS:

- Learn HTML IN A Weekend By Steven E. Callihan, PHI
- Using HTML by Lee Anne Phillips
- Teach Yourself Javascript In 24 Hrs. by Michael Moncur, Techmedia
- Introduction to HTML and CSS -- O'Reilly , 2010
- HTML and CSS, Jon Duckett, John Wiely, 2012

4BCAOE4 - OPEN ELECTIVE

Choose form the list given from this department or from other department

Credit:3

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SEMESTER - V

5BCACCC11- DOT NET PROGRAMMING

Credit:6 (L:T:P 4:0:2)

Course Objectives

The purpose of this course is to

- Provide a strong programming hand to one of the popular technologies dot net.
- Understand from structure and basics of .NET framework
- Process of Rapid Application Development environment in VB.NET as well as ASP.NET.
- Includes the backend database applications in applications
- Developing complete applications in .NET technology.

UNIT – I

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, visual development & event drive Programming -Methods and events. Variables, Data Type of variables, Scope & lifetime of a variable, Arrays, Collections, Subroutines, Functions, Control flow statements: conditional statement, loop statement. Msgbox& Input box.

UNIT – II

Forms: Loading, showing and hiding forms,

GUI Programming with Windows Form: Textbox, Label, Button, Listbox,Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, There Properties, Methods and events. Dilog boxes, Designing menues: ContextMenu, access. Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Overloading.

UNIT - III

Database programming with ADO.NET Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. data bound controls, data grid.

UNIT - IV

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, Web forms, web form controls -server controls, client controls, web forms, HTML, Adding controls to a web form , Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, Validation, Controls, Calendar control, Internet Explorer Control. State management- View state, Session state, Application state.

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UNIT - V

Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls, Writing datasets to XML, Reading datasets with XML. Web services: Introduction, Remote method call using XML, SOAP, web service description language.

Expected Outcomes

At the end of this course,

- Will have knowledge and strong programming hand to the dot net
- Rapid Application Development using VB.NET and ASP.NET.
- Develop frontend and backend database applications.
- develop complete applications in .NET technology.

TEXT & REFERENCE BOOKS:

- Vb.Net Programming Black Book By Steven HolznerDreamtech Publications
- Mastering Vb.Net By Evangelos Pet Routsos - Bpb Publications
- Introduction To .Zvet Framework -Worx Publication MSDN. Microsoft.Com/ Net Www.Gotdotnet. Com
- Vb.Net Black Book By Steven HolznerDreamiech
- Asp.Net Unleashed

Practical list for DOT NET Programming

VB.Net : Practicals list for submission.

1. Write a Program to calculate square and cube of any number.
2. Design the digital watch using Timer Control.
3. Write a program for Book Issue module of Library Management System.
4. WAP to input marks of 3 subject ENGLISH, HINDI, and MATHS as input on console. Display total marks, percentage and find the subject in which lowest marks is obtained.
5. Design the following form. So that when user selects and clicks the arrow button it performs the required result. (FIG 1)
6. Write a program for performing the functions of a Simple Calculator.
7. Write a VB.NET program to accept any character from keyboard and display whether it is vowel or not.
8. Write a Program to Add, Subtract, Multiply and Divide any two numbers by using Input and Message box.
9. Design the following form. So that when user clicks on Radio Button then select appropriate check box. (FIG 2)
10. Write a Program to find result of student if minimum marks for pass is (>=40) for each subject.
11. Write a program to find smallest number using array.
12. Write a program to find whether number input from the user is prime or not.
13. Design the following Calculator:
14. Write a program for performing the functions of a new Web Browser.

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15. Write a Program using a list box and combo box.
16. Create one Text Box and one Button. When you click Button, Text Box will show "HELLO WORLD".
17. Design the following Tic-tac-toe game:
18. Write a program for performing the functions of a Scientific Calculator.
19. Create a class that has three fields Principal, Rate and Time. Define a function SI in class that will calculate and return Simple Interest.
20. Write an application to swap any two elements of array. Take index numbers of both as input.
21. Design the following Login Form and make it functional
22. Write a program for creating a new Word Editor.
23. Write a Program to Add, Subtract, Multiply and Divide any two numbers by using Input and Message box.
24. Write a Program to print any number table with standard format.
25. Design the following form for calculating the Simple and Compound Interest and make it functional.
26. Write a program to display first 10 even numbers and add them using five formats of looping.
27. To implement a Visual Basic program to perform string operations based on the user choice.
28. Create a program for launch of a rocket on the screen.
29. Design a Calculator Window Application that will take two numbers and will perform add, subtract, multiply and division operation.

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5BCACCC12- WEB DEVELOPMENT WITH PHP

Credit:6 (L:T:P 4:0:2)

Course Objectives

- Be able to learn the concept of PHP environment to create, debug and run simple PHP programs.
- Understand fundamentals of PHP Programming such as Character Set, Variables, Data Types, Conditional and Iterative Execution, Functions etc.
- Able to execute fundamental programming and web programming
- Able to create and use Arrays, Web forms, Files, Object-Oriented Programming etc.
- Able to work with Database in web pages

UNIT-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, software requirements, Installation and Configuration of PHP, Basic HTML, Embedding PHP in HTML, PHP Basic Syntax, Data Types, Comments, Variables and Constants, Scope of Variables, PHP String, PHP Operators, Precedence of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

UNIT-II

PHP Conditional Statements, Switch case, PHP Looping Statements, while ,For and Do While Loop, Break, Continue, Exit, PHP Functions: Built-in and User Defined Function, declaration and calling of a function, Function argument with call by value, call by reference, String Manipulation, Mathematical, Date and Time Functions, Unit-III

UNIT-III

Introduction to a Web Form, Processing a Web Form, Capturing Form Data, Passing Information between Pages, PHP $_GET, PHP $_POST, with multi value fields, Validating a Web Form, Input Validation, Exception and Error Handling, Introduction to Cookies and Session Handling,

PHP File Permissions, Working with Files: Opening, Closing, Reading, Writing a File; Working with Directory: Creating, Deleting, Changing a Directory

UNIT-IV

Working with Database: PHP-Supported Databases; Using PHP & My SQL: Installation and Configuration of My SQL on Windows, Checking Configuration, Connecting to Database, Selecting a Database, Adding Table and Altering Table in a Database,

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Inserting, Deleting and Modifying Data in a Table, Retrieving Data, Performing Queries, Processing Result Sets,

UNIT-V

PHP Arrays: Creating Array and Accessing Array Elements, Code Re-use, require(), include(), and the include_path, File System Functions and File Input and Output, File Uploads, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows

Expected Outcomes

- Able to learn the concept of programming in HTML and PHP environment
- Understand PHP Programming fundamentals like Character Set, Variables, Data Types, Conditional and Iterative Statements, Functions etc.
- Able to execute built in functions related to String Manipulation, Mathematical, Date and Time etc.
- Able to execute programs related to Arrays, Web forms, Files, Object-Oriented Programming etc.
- Able to work Database in web pages

TEXT BOOKS:

- Steven Holzner, The Complete Reference PHP, TMH
- Steve Suehring, Tim Converse and Joyce Park, Wiley-India Pvt Ltd
- REFERENCE BOOKS:
- Matt Doyle, Beginning PHP, Wiley-India Pvt Ltd
- Joel Murach and Ray Harris, Murach's PHP & MY SQL, SPD Pvt Ltd

Software Lab Based on PHP

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. Write a PHP script that finds out the sum of first n odd numbers.
4. WAP to check whether the given number is prime or not.
5. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
6. Write a PHP function that checks if a string is all lower case.
7. 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)
8. WAP to create and sort an array.
9. WAP to create an associative array.
10. Write a PHP script that removes the whitespaces from a string.
    a. Sample string : 'The quick brown fox'
    b. Expected Output : Thequickbrownfox

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11. 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.
12. Write a PHP script that checks if a string contains another string.
13. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
14. Using switch case and dropdown list display a "Hello" message depending on the language selected in drop down list.
15. Write a PHP program to print Fibonacci series using recursion.
16. Write a PHP script to replace the first 'the' of the following string with 'That'.
    a. Sample : 'the quick brown fox jumps over the lazy dog.'
    b. Expected Result : That quick brown fox jumps over the lazy dog.
17. Write a PHP script to read a file character by character
18. Write a PHP script to append text to a file

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5BCACCE(A) - WINDOWS SERVER ADMINISTRATION

Credit:6 (L:T:P 4:0:2)

Course Objectives

The objective of this course is to provide a strong formal foundation in Windows server installation and administration and develop participants as Windows server administrator

- To understand Architecture of Windows server 2012.
- Installation of Server, Creating & implementing plans.
- Implement User Management active director and domain controller.
- Implement file services & group policies.

UNIT – I

Preparing for Windows Server 2012 - Planning for Windows Server 2012, Assessing the readiness of your environment

Deploying servers - Installation options, Preparing the build lab, Building images, Deploying images

UNIT - II

Server remote management - Server Manager, Server management tasks, Installing roles and features, Windows PowerShell automation

Deploying domain controllers - Preparing for deploying domain controllers, Deploying domain controllers using Server Manager, Deploying domain controllers using Windows PowerShell

Active Directory administration - Administering Active Directory objects using ADAC, Enabling advanced features using ADAC, Administering Active Directory using Windows PowerShell

UNIT - III

Network administration - Ensuring DHCP availability, Implementing DNSSEC, Managing networking using Windows PowerShell, Configuring IPv6/IPv4 interoperability

Hyper-V virtualization - Deploying and configuring Hyper-V hosts, Deploying and configuring virtual machines, Managing virtual machines

UNIT - IV

File services and storage - Deploying Storage Spaces, Provisioning and managing shared storage, Configuring iSCSI storage

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Print and document services - Deploying and managing print servers, Managing print servers using Windows PowerShell

UNIT - V

Implementing Group Policy - Planning, configuring, and managing Group Policy, Managing Group Policy using Windows PowerShell, Implementing Group Policy preferences

Configuring Windows Firewall and IPsec - Configuring Windows Firewall with Advanced Security, Configuring IPsec

Expected Outcome

At the end of the course student will be able to

- Understand Architecture of Windows server 2012.
- Installation of Server, Creating & successfully implementing plans.
- Implement User Management active directory and domain controller.
- Implement file services & group policies
- Configure Windows Firewalls and IPsec.

TEXT & REFERENCE BOOKS :

- Mitch Tulloch, Installing & Configuring Windows Server 2012 Training Guide, Microsoft Press.

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5BCACCE(B) - LINUX SERVER ADMINISTRATION

Credit:6 (L:T:P 4:0:2)

Course objectives

The course aims to make students will

- Fully understand the most important and fundamental concepts of Linux server administration,
- Will be able to put those concepts to use in real-world situations.
- Understand how to install and customize Linux (administration of Linux servers from the GUI);
- Manage users, permissions, folders, and native applications;
- Configure Internet and intranet services (understanding and managing the Linux TCP/IP networking stack and services);
- Performance tuning, security (building robust firewalls, and routers), and
- Creating and maintaining print, e-mail, FTP, and web servers.

UNIT – I

Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces..

UNIT–II

Understanding shells, Processes in linux, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi & vim editor. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

UNIT–III

Introduction to Shell Programming-develop some shell programs.
System administration: Common administrative tasks, configuration and log files, Role of system administrator.
Installing requirement, Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.

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UNIT-IV

Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages.
Starting & Using KDE & Gnome graphical interfaces.
Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services.

UNIT-V

Installation, configuration & Administration of following servers in Linux

- Mail server
- DNS
- Remote access
- ftp server
- Apache web server
- Vnc Server

Course outcome

At the end of this course student will able to

- Fully understand the fundamental concepts of Linux server administration,
- Put those concepts to use in real-world situations.
- Install and customize Linux (administration of Linux servers from the GUI);
- Manage users, permissions, folders, and native applications;
- Configure Internet and intranet services (understanding and managing the Linux TCP/IP networking stack and services);
- Performance tuning, security (building robust firewalls, and routers), and
- Creating and maintaining print, e-mail, FTP, and web servers.

TEXT & REFERENCE BOOKS:

- Fedora 9 And Red Hat Enterprise Linux Bibile by Christopher Negus, Wiley India Ltd.
- Linux Bible, 9ed, by Christopher Negus, Wiley India Ltd
- Linux Administration, by Kogent Learning Solutions Inc., ISBN 13- 9789350044209, ISBN 10-935004420X, Wiley India
- Unix & Shell Programming by Forouzan, Cengage Publications

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5BCASEC3 - ORACLE

Credit:3 (L:T:P 2:0:1)

Course Objectives

The objective of this course is to provide a strong formal foundation in database concepts implementation, technology and practice to the participants to groom them into well-informed database application developers.

- To understand Architecture of Oracle database.
- Implement simple SQL Queries.
- Implement User Management.
- Implement PL/SQL Constructs.

UNIT - I

Oracle product details, SQL,SQL*Plus ,Oracle Architecture ,Interfaces to Oracle ,Command Line Interface ,Viewing a Sample Table ,The Graphical User Interface. Working with Tables. Categories of SQL Statements , Oracle Data types. Data Constraints, Select Command.

UNIT - II

Oracle Operator, Range Searching, Pattern Matching, Oracle Built In Function, The DISTINCT Keyword , Miscellaneous Functions , Mathematical Functions ,String Functions ,Date Functions ,Pseudo Columns Grouping data from Tables in SQL, Manipulation Data in SQL, Joining Multiple Tables.

UNIT – III

Sub queries,Oracle Security –Privileges, Creating view, Granting Permissions, - Updating, Selection, Destroying view Creating Indexes. Creating and Managing, Working with Sequences, Synonyms

UNIT – IV

PL/SQL Introduction, Data type support in PL/SQL, Conditional Statements, Using DML Within PL/SQL, Procedures & Functions, Cursors, Parameterized Cursor.

UNIT - V

Exception handling in PL/SQL, Triggers - Concept, use, how to apply database triggers, type of triggers, Syntax.

Course Outcome

- Understand, appreciate and effectively explain the underlying concepts of database technologies.

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- Populate and query a database using SQL DML/DDL commands.
- Implement Security By applying User Management .
- Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
- Programming PL/SQL including stored procedures, stored functions, cursors, Exception Handling and Triggers.

TEXT & REFERENCE BOOKS:

- IVAN BAYROSSS "SQL. PL/SQL", BPB PUBLICATIONS"
- LIEBSCHUTY. 'THE ORACLE COOKBOOK", BPB PUBLICATION
- MICHAEL ABBEY, MICHAEL JCOREY, 'ORACLE A BEGINNERS GUIDE". TMH PUBLICATION GUIDE". TMH PUBLICATION
- ORACL DATA BASE 11 G SATISH ASNANI PHI LEARNING
- Oracle official Site WW W.Oracle.com

List of Practical

1. To study DDL-create and DML-insert commands.

(i) Create tables according to the following definition.

CREATE TABLE DEPOSIT (ACTNO VARCHAR2(5) ,CNAME VARCHAR2(18) , BNAME VARCHAR2(18) , AMOUNT NUMBER(8,2) ,ADATE DATE);

CREATE TABLE BRANCH (BNAME VARCHAR2 (18),CITY VARCHAR2(18));

CREATE TABLE CUSTOMERS (CNAME VARCHAR2 (19) ,CITY VARCHAR2(18));

CREATE TABLE BORROW (LOANNO VARCHAR2 (5), CNAME VARCHAR2 (18), BNAME VARCHAR2(18), AMOUNT NUMBER (8,2));

(ii) Insert the data as shown below.

DEPOSIT

ACTNO	CNAME	BNAME	AMOUNT	ADATE
100	ANIL	VRCE	1000.00	1-MAR-95
101	SUNIL	AJNI	5000.00	4-JAN-96
102	MEHUL	KAROLBAGH	3500.00	17-NOV-95
104	MADHURI	CHANDI	1200.00	17-DEC-95
105	PRMOD	M.G.ROAD	3000.00	27-MAR-96
106	SANDIP	ANDHERI	2000.00	31-MAR-96
107	SHIVANI	VIRAR	1000.00	5-SEP-95
108	KRANTI	NEHRU PLACE	5000.00	2-JUL-95

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109	MINU	POWAI	7000.00	10-AUG-95

CUSTOMERS

ANIL	CALCUTTA
SUNIL	DELHI
MEHUL	BARODA
MANDAR	PATNA
MADHURI	NAGPUR
PRAMOD	NAGPUR
SANDIP	SURAT
SHIVANI	BOMBAY
KRANTI	BOMBAY
NAREN	BOMBAY

BORROW

LOANNO	CNAME	BNAME	AMOUNT
201	ANIL	VRCE	1000.00
206	MEHUL	AJNI	5000.00
311	SUNIL	DHARAMPETH	3000.00
321	MADHURI	ANDHERI	2000.00
375	PRMOD	VIRAR	8000.00
481	KRANTI	NEHRU PLACE	3000.00

From the above given tables perform the following queries:

(1) Describe deposit, branch.

(2) Describe borrow, customers.

(3) List all data from table DEPOSIT.

(4) List all data from table BORROW.

(5) List all data from table CUSTOMERS.

(6) List all data from table BRANCH.

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(7) Give account no and amount of depositors.

(8) Give name of depositors having amount greater than 4000.

(9) Give name of customers who opened account after date '1-12-96'.

2. **Create the below given table and insert the data accordingly.**

Create Table Job (job_id, job_title, min_sal, max_sal)

COLUMN NAME	**DATA TYPE**
job_id	Varchar2(15)
job_title	Varchar2(30)
min_sal	Number(7,2)
max_sal	Number(7,2)

Create table Employee (emp_no, emp_name, emp_sal, emp_comm, dept_no)

COLUMN NAME	DATA TYPE
emp_no	Number(3)
emp_name	Varchar2(30)
emp_sal	Number(8,2)
emp_comm	Number(6,1)
dept_no	Number(3)

Create table deposit(a_no,cname,bname,amount,a_date).

COLUMN NAME	DATA TYPE
a_no	Varchar2(5)
cname	Varchar2(15)
bname	Varchar2(10)
amount	Number(7,2)
a_date	Date

Create table borrow(loanno,cname,bname,amount).

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COLUMN NAME	DATA TYPE
loanno	Varchar2(5)
cname	Varchar2(15)
bname	Varchar2(10)
amount	Varchar2(7,2)

Insert following values in the table **Employee**.

emp_no	**emp_name**	**emp_sal**	**emp_comm**	**dept _no**
101	Smith	800		20
102	Snehal	1600	300	25
103	Adama	1100	0	20
104	Aman	3000		15
105	Anita	5000	50,000	10
106	Sneha	2450	24,500	10
107	Anamika	2975		30

Insert following values in the table **job**.

job_id	**job_name**	**min_sal**	**max_sal**
IT_PROG	Programmer	4000	10000
MK_MGR	Marketing manager	9000	15000
FI_MGR	Finance manager	8200	12000
FI_ACC	Account	4200	9000
LEC	Lecturer	6000	17000
COMP_OP	Computer Operator	1500	3000

Insert following values in the table **deposit**.

A_no	**cname**	**Bname**	**Amount**	**date**
101	Anil	andheri	7000	01-jan-06
102	sunil	virar	5000	15-jul-06
103	jay	villeparle	6500	12-mar-06

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104	vijay	andheri	8000	17-sep-06
105	keyur	dadar	7500	19-nov-06
106	mayur	borivali	5500	21-dec-06

Perform following queries

(1) Retrieve all data from **employee, jobs and deposit.**

(2) Give details of account no. and deposited rupees of customers having account opened between dates **01-01-06 and 25-07-06**.

(3) Display all jobs with minimum salary is greater than 4000.

(4) Display name and salary of employee whose department no is 20. Give alias name to name of employee.

(5) Display employee no,name and department details of those employee whose department lies **in(10,20)**

To study various options of LIKE predicate

(1) Display all employee whose name start with 'A' and third character is ' 'a'.

(2) Display name, number and salary of those employees whose name is 5 characters long and

first three characters are 'Ani'.

(3) Display the non-null values of employees and also employee name second character should be 'n' and string should be 5 character long.

(4) Display the null values of employee and also employee name's third character should be 'a'.

(5) What will be output if you are giving LIKE predicate as '%_%' ESCAPE '\'

3. To Perform various data manipulation commands, aggregate functions and sorting concept on all created tables.

(1) List total deposit from deposit.

(2) List total loan from karolbagh branch

(3) Give maximum loan from branch vrce.

(4) Count total number of customers

(5) Count total number of customer's cities.

(6) Create table supplier from employee with all the columns.

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(7) Create table sup1 from employee with first two columns.

(8) Create table sup2 from employee with no data

(9) Insert the data into sup2 from employee whose second character should be 'n' and string should be 5 characters long in employee name field.

(10) Delete all the rows from sup1.

(11) Delete the detail of supplier whose sup_no is 103.

(12) Rename the table sup2.

(13) Destroy table sup1 with all the data.

(14) Update the value dept_no to 10 where second character of emp. name is 'm'.

(15) Update the value of employee name whose employee number is 103.

4. Displaying data from Multiple Tables (join)

(1) Give details of customers ANIL.

(2) Give name of customer who are borrowers and depositors and having living city nagpur

(3) Give city as their city name of customers having same living branch.

(4) Write a query to display the last name, department number, and department name for all employees.

(5) Create a unique listing of all jobs that are in department 30. Include the location of the department in the output

(6) Write a query to display the employee name, department number, and department name for all employees who work in NEW YORK.

(7) Display the employee last name and employee number along with their manager's last name and manager number. Label the columns Employee, Emp#, Manager, and Mgr#, respectively.

(8) Create a query to display the name and hire date of any employee hired after employee SCOTT.

To apply the concept of Aggregating Data using Group functions.

(1) List total deposit of customer having account date after 1-jan-96.

(2) List total deposit of customers living in city Nagpur.

(3) List maximum deposit of customers living in bombay.

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(4) Display the highest, lowest, sum, and average salary of all employees. Label the columns Maximum, Minimum, Sum, and Average, respectively. Round your results to the nearest whole number.

(5) Write a query that displays the difference between the highest and lowest salaries. Label the column DIFFERENCE.

(6) Create a query that will display the total number of employees and, of that total, the number of employees hired in 1995, 1996, 1997, and 1998

(7) Find the average salaries for each department without displaying the respective department numbers.

(8) Write a query to display the total salary being paid to each job title, within each department.

(9) Find the average salaries > 2000 for each department without displaying the respective department numbers.

(10) Display the job and total salary for each job with a total salary amount exceeding 3000, in which excludes president and sorts the list by the total salary.

(11) List the branches having sum of deposit more than 5000 and located in city bombay.

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SEMESTER - VI

6BCACCC13- PROJECT ANALYSIS & DESIGN

Credit:6 (L:T:P 0:2:4)

All the candidates of BCA are required to submit a project-report. These projects are to be carried out on real life problems. The detailed guidelines related to this are to be provided later on the University's website.

6BCACCC14 - PROJECT DEVELOPMENT & IMPLEMENTATION

Credit:6 (L:T:P 0:2:4)

All the candidates of BCA are required to submit a project-report. These projects are to be carried out on real life problems. The detailed guidelines related to this are to be provided later on the University's website.

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6BCACCE(A) - CLOUD COMPUTING

Credit:6 (L:T:P 4:0:2)

Course Objectives

- To study cloud computing concepts;
- Enhancing cloud computing environment.
- To study various platforms
- To study the applications that uses cloud computing.

UNIT - I

Introduction, Roots of Cloud Computing: From mainframe to Cloud, Benefits of Cloud Computing SOA, Web services,

Web 2.0, Mashups, Grid computing, Utility computing, Hardware virtualization, Essentials of Cloud characteristics, Challenges, Cloud economics, Role of Networks in Cloud Computing: Cloud types and service models, Cloud computing platforms : Openstack, Opennimbus, Eucalyptus

Primary Cloud Service models, Cloud Services brokerage, Primary cloud deployment models, cloud computing reference model, The greenfield and brownfield deployment options

UNIT - II

Virtualization

Introduction, Characteristics of Virutalized environments, Taxonomy of Virtualization techniques, Pros and Cons of Virtualization, Technology examples:Xen, KVM, Vmware, Microsoft Hyper-V

UNIT - III

Storage in Cloud

Storage system architecture, Big data, Virtualize data centre(VDC) architecture, VDC Environment, server, storage, networking, desktop and application virtualization techniques and benefits, Virtual Machine Components and Process of converting physical to VMs, Block and _le level storage virtualization, Virtual Provisioning, and automated storage tiering, VLAN, VSAN and benefits, Network trafic management techniques in VDC, Cloud _le systems: GFS and HDFS, BigTable, HBase and Dynamo. Features and comparisons among GFS,HDFS.

UNIT - IV

Cloud computing platforms

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Infrastructure as Service, best-of breed cloud infrastructure components,cloud ready converged infrastructure, Virtual machine provisioning and migration services, Anatomy of Cloud infrastructure, Distributed management of virtual infrastructure, scheduling techniques, SLA Commitment

UNIT - V

Cloud monitoring and management

Introduction and architecture for federated cloud computing, Performance prediction for HPC on Cloud. SLA management: Types of SLA, Life cycle of SLA, Traditional approaches of SLA.

service catalog, service ordering process, management and functional interfaces of services, cloud portal and its functions, cloud interface standards along with SOAP and REST, system integration and work-ow modeling, cloud service life-cycle phases: service planning, service creation, service operation, and service termination Control layer, its functions and benefits, element and unified manager, software defined approach and techniques for managing IT resources

Expected Outcomes

- To present a survey on cloud building blocks and technologies.
- Compare the strengths and limitations of cloud computing
- Identify the architecture, infrastructure and delivery models of cloud computing
- Apply suitable virtualization concept.
- Choose the appropriate cloud player , Programming Models and approach.
- To install cloud computing environments.
- To perform cloud computing admin and programming using open source tools.

Text Books:

1. Rajkumar Buyya, Cloud computing principles and paradigms", Wiley
2. Gautam Shro_, Enterprise Cloud Computing, Cambridge
3. Handbook of Cloud Computing, Springer Publication
4. Rajkumar Buyya, \Mastering Cloud computing", McGraw Hill
5. Tim Mather, Subra K, Shahid L.,Cloud Security and Privacy, Oreilly,ISBN-13 978-81-8404-815-5

Reference Books:

1. Dr. Kumar Saurabh,"Cloud Computing", Wiley Publication
2. Greg Schulr,"Cloud and virtual data storage networking",CRC Press
3. Barrie Sosinsky,"Cloud Computing", Wiley India
4. Kailash Jayaswal, \ Cloud computing", Black Book, Dreamtech Press

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5. Anthony T. Velte, Cloud Computing: A Practical Approach, Tata McGraw Hill, 2009, ISBN: 0070683514

6. Richard Hill, Guide to Cloud Computing: Principals and Practices, Springer ISBN-10: 1447146026

7. Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, Cloud Computing for Dummies, Wiley India, 2009, ISBN 8126524871

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6BCACCE(B) - ANDROID PROGRAMMING

Credit:6 (L:T:P 4:0:2)

Course Objectives

This course is designed for providing essential skills and experiences to the students in developing Android Applications.

- A student will learn to use Eclipse and/or Android Studio and SDK as development environment.
- A student will learn to develop his own Android App using concepts like Activity, Layout, UI Elements, Service, Broadcast Receiver, Content Provider, Intents, Fragments, Multimedia, etc.
- A student will learn to develop his own Android App with SQLite Database Connectivity.

UNIT - I

Various Mobile Platforms, Introduction to Android, History and Versions of Android, Android API, Android Architecture, Android Runtime, Dalvik Virtual Machine, Features of Android, Introduction and Installation of Eclipse and ADT Plugin and/or Introduction and Installation of Android Studio, Requirements and Installation of Android SDK, SDK Manager, Emulator, AVD, Android Virtual Device Manager, Google Play Account, Installing Android App from Google Play, apk file

UNIT - II

Setting up Development Environment, Installing Packages using SDK Manager, Android Project Structure, Creating Hello Android App, Deploy it on USB-connected Android device, Setting up an Emulator, Android Tool Repository, Manifest File, DDMS, File Explorer, Installing and Running Android - Hello App, Activity Life Cycle and its methods, Logcat, Components of an Android App – Activity, Service, Broadcast Receiver, Content Provider

UNIT - III

Layout – Linear Layout, Relative Layout, ScrollView Layout, Table Layout, Frame Layout, UI Resources – Layout Resources, UI Elements, Views – TextView, EditText, Button, CheckBox, RadioButton, ImageButton, Spinner, Navigating between Activities – Intent, Exchanging Data between Activities, Action Bar, Event Handling, Listeners, Notifying the User –Toast

UNIT - IV

Using Threads, ImageView, Exception Handling, Multimedia - Playing Audio using an Intent, Playing Video using an Intent, Playing Audio using MediaPlayer, Playing Video using VideoView. Fragment, Fragment Life Cycle,

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UNIT - V

SQLite Database, Creation of Database and Tables, CRUD operations – Create, Retrieve,Update and Delete operations, Cursor, ListView,

Introduction - RESTful Web Services, JSON, Google Play Services, Location Services, Publishing Apps.

Expected Outcomes

After completing this course, a student will be able to:

- Build and deploy his Android application.
- Knowledge of Eclipse and Android Studio.
- Understand the operation of the application, application lifecycle, configuration files, intents, and activities.
- Get a better understanding of the UI - components, layouts, event handling, and screen orientation.
- Develop a working knowledge of the custom UI elements and positioning.
- Have an in-depth understanding of broadcast receivers and services.
- Develop Android App using Multimedia Contents.
- Develop Android App using Database connectivity with SQLite Database.

Text Books:

- James C. Sheusi, " Android Application Development For Java Programmers", Cengage Learning, 2013.
- Wallace Jackson, "Android Apps for Absolute Beginners", Apress, ISBN : 9788132211372

Reference Books:

- Michael Burton, Donn Felker, "Android Application Development for Dummies", Dummies, ISBN : 9788126538775
- Pradeep Kothari, " Android Application Development (with Kitkat Support)", Kogent Learning Solutions Inc., Black Book, DreamTech Press, ISBN : 9789351194095
- W. Frank Ableson, Robi Sen, Et. Al., " Android in Action", Manning, ISBN : 9789350042915
- Charlie Collins, Michael Galpin, Et. Al., " Android in Practice", Manning, ISBN : 9789350042397
- Anubhav Pradhan, Anil V Deshpande, "Composing Mobile App, Learn | Explore | Apply using Android", Wiley, ISBN : 9788126546602

Online Reading / Supporting Material:

- http://www.developer.android.com
- http://developer.android.com/about/versions/index.html
- http://developer.android.com/training/basics/firstapp/index.html

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- http://docs.oracle.com/javase/tutorial/index.htm (Available in the form of free downloadable ebooks also).
- http://developer.android.com/guide/components/activities.html
- http://developer.android.com/guide/components/fundamentals.html
- http://developer.android.com/guide/components/intents-filters.html.
- http://developer.android.com/training/multiscreen/screensizes.html
- http://developer.android.com/guide/topics/ui/controls.html
- http://developer.android.com/guide/topics/ui/declaring-layout.html
- http://developer.android.com/training/basics/data-storage/databases.html

Android Application Programming Lab :

List of Practical :

1. Installing Android Environment
2. Create "Hello World" application. That will display "Hello World" in the middle of the screen in the emulator. Also display "Hello World" in the middle of the screen in the Android Phone.
3. Create an application with login module. (Check username and password).
4. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
5. Create a menu with 5 options and and selected option should appear in text box.
6. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
7. Create an application with three option buttons, on selecting a button colour of the screen will change.
8. Create and Login application as above. On successful login, pop up the message.
9. Create an application to Create, Insert, update, Delete and retrieve operation on the database.
10. Create a Simple Application using Android Resources.
11. Create a Simple Application using Layouts.
12. Create a Simple Application using Intents.
13. Create a Simple Application using user interfaces.
14. Create a Simple Application for playing Audio and Video files.

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6BCASEC4 - COMPUTERISED ACCOUNTING WITH TALLY

Credit:3 (L:T:P 2:0:1)

Course Objectives

To impart expertise accounting knowledge with practical implementation with help of accounting software tally to help business and other organizations to manage its financial activities.

UNIT - I

Tally Configuration & INI setup, Data Directory & Folders configuration, Single & Multiple User, Tally Screen Components, Mouse / Keyboard Conventions & Key, Combinations, Switching between screen areas, Quitting Tally.Maintaining Company Data, Basic Company Details, Create/Alter/Select/Load/Close a Company, Chart of Accounts, Company Features, Configuration.

UNIT – II

Create, Alter & Display Groups and Ledgers, All accounting vouchertypes and transactions, Create and Alter new Voucher type, Item andAccount Invoice transactions, Excise Invoice, Export Invoice,Transactions using Bill-wise detailsCreate, Alter & Display Cost Centre and Cost Categories, Cost centre& Cost Category allocation in voucher entry, Creating Cost centreClass, Invoice entry in a Class situation,Create, Alter & Delete Foreign Currencies, Voucher entry usingforeigncurrency,Bank Reconciliation, Interest calculations using simple &advanceparameters, Interest calculations on outstanding balances &oninvoices, Use of voucher class, adjustment of interest, Creation ofvoucher class, Invoice entry in a class situation.

UNIT – III

Create, Alter & Delete Budgets for groups, ledgers & cost centres,Defining credit limit & credit period, Display Budgets & variances, Create, Alter & Delete a scenario.Enabling Job Costing in Tally, Master creation & configuration forJob costing, Creation of Voucher type & Voucher class for StockTransactions, Creation of Transfer journal for transfer of stockbetweengodowns, Consumption journal Transactions, paymentvoucher, Godown summary Report, Job Work Analysis, Materialconsumptionsummary.Reports like balance sheet, Profit & Loss account, Ratio analysis,TrialBalance.Accounts books like cash/bank book, All ledgers, Group summary &vouchers, Sales, purchase & journal registers, Cost centre&category summary, Cost centre breakup, ledger & group breakup,outstanding receivables & payables, interest receivable &payable,Statistics, Cash & Fund flow, Day book, List of Accounts, Reversingjournals, optional vouchers, post-dated vouchers.

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UNIT – IV

Create, Alter & Display Stock Groups and Stock Items, Stock itembehaviour using costing and market valuation method, otherbehaviour like treating all sales as new manufacture, treating allpurchases as consumed, treating all rejections inward as scrap,ignoring negative balances, Treating difference due to physicalcounting, Create, Alter & Display Stock categories, Create, Alter,Display simple & compound units of measures, Stock items usingalternate units, Defining standard cost & selling price, Defining Rateof duty, Defining MRP, Create, Alter & Display Godowns, Allocation ofitems to the Godowns, All inventory voucher types and transactions,Inventory details in accounting vouchers,Defining re-order level, Transactions using tracking numbers, Use ofbatch-wise details in voucher, Additional cost details in vouchers,Creating Bill of material, Cost estimation, Creating Price list &defining Price levels, invoice using Price list, Zero valued entries,Transactions in case of Different actual & billed quantities.Reports like Stock summary, Inventory books like Stock item, Groupsummary, Stock transfers, Physical stock register, Movementanalysis, Stock group & item analysis, stock category analysis,Ageing analysis, Sales order & Purchase order book, Statement ofinventory related to Godowns, categories, stock query, Reorderstatus, Purchase & Sales order summary, Purchase & Sales billpending, Exception reports like negative stock & ledger, overduereceivables& payables, memorandum vouchers, optional vouchers,post-dated vouchers, reversing journals.

UNIT – V

Cheque Printing, Common printing options, Different printingformats, Multi-Account printing, Dynamic- Report specific options.Creating Group Company, Use of Tally vault, Using Security control &defining different security levels, Use of Tally Audit.Back-up & Restore, Splitting company data, Export & import of Data,ODBC compliance, use of E-mail, Internet publishing, Upload, webbrowser& online help, Re-write data.

TEXT & REFERENCE BOOKS:

- Implementing Tally 6.3 by Nadhani; BPB Publications, ISBN:817656494X
- BPB Tally 6.3 by BPB Editorial Board (Hindi) BPBPublications, ISBN 81-7656-594-6

PRACTICAL LISTS (Tally)

Practical Assignment -1

1. Create a Company as "Sagar Industries Ltd." in Tally with inventory management.
2. Pass the following Entries :-

(i) Sagar started "Sagar Industries Ltd." by bringing Capital Rs.3, 00,000/- Cash.
(ii) He deposited Rs.1, 00,000/- cash at ICICI bank.
(iii) He paid electricity bill for Rs.1, 200/- by cash.
(iv) He withdrawn Rs.10, 000/- cash for his personal use.
(v) He purchased the following item from Computer Lab. Ltd. on credit with 4% Vat

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rate.
(a) Computer - 10 Nos. - @20000/- each
(vi) He sold the following item to Somnath Traders in cash with 4% Vat rate.
(a) Computer - 5 Nos. - @27500/- each
(vii) He received Rs.6, 000/- as commission from Rohit by cash.
(viii) He paid House Rent for Rs.5, 000/- by cash.
(ix) He withdrawn Rs.25, 000/- cash from ICICI Bank.
(x) He purchased furniture for Rs.25, 000/- by cash for office use.
3. Show the Trial Balance and Balance Sheet of "Sagar Industries Ltd."
4. Show the Vat Computation report of the above company.
5. Show the Cash Book & Bank Book of the company.
6. Show the Day Book.

Practical Assignment -2

1. Jyoti Printers over took all the printing Expenses is of Rs. 1500/-
2. Under packing Expens & from Hariom packing lmt. Rs. 5000/-
3. Kashav & brother's help in feuling of Rs. 300/-
4. Com. open in Bank of india, an account with Rs. 100,000./-
5. From Ram lal & son's 4000/- is to be taken of previous year.
6. Under Madical expencs we purchase Rs. 750/- Medical from Mahima Medical.
7. One NANO car of RS.1,25,000/- from TATA Moter's.
8. From M/s R.K. Invastment's we purchase share's of SAMSUNG. of Rs.7500.
9. From Soni Brother's Gold @ 35,000/- is purchased.
10. From XYZ & son's Rs. 5000/- is due of previous year.
11. Payment is done to Hariom packing lmt. of Rs.3500/-.
12. Payment to Kulvinder & Son's is done of Rs.2700/-
13. Payment to TATA Moter's is done by D.D. Rs 1,25,000/- which is 1500/- bank commission paid by us. 14. From Arjun Ltd. 7000/- is to be taken of previous year.
15. Payment to Soni Brother's has done by cheque of Rs. 35,000/-
16. From XYZ & son's we recieved Rs. 5000/-
17. Payment to Jyoti Printer's has been done by cheque.
18. Payment to Hariom packing lmt. we paid his whole amount by chaque

Practical Assignment -3 Payment & Reciept Voucher
1. Com. has opening cash Rs. 100000/-
2. Mr. Rajendra is the ownar of the company his opening capital Rs. 2,00,000/-
3. Com. has to recived from privious year. {1} VIKAS NAGAR - 75,000/- {2} HARISH KUMAR - 75,000/-
4. Com. paid for fuill charges Rs. 500/- in cash. 5. Com. purchase chairs in cash Rs. 2,000/-.
6. Com. Recived from Harish Kumar Rs. 25,000/- in cash.
7. Com. purchase packing meterial of Rs.5000/-

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8. Paid to Vivek worker 25,000/- as a loan.
9. Com paid to Vivek worker Rs. 2,000/- in cash salary.
10. Com. Recived from Vikas Nagar 35,000/- in cash.
11. Com. Purchase shairs of Tata of Rs. 16,000/- in cash.
12. Com. paid Building Rent Rs. 35,000/- in cash.
13. Com. sales in cash Shairs of Tata Rs. 26,000/- in cash.
14. Paid Mobile bill of Rs. 1250/- in cash.
15. Com. paid water bill Rs. 750/- & Electricity bill Rs. 4500/- in cash.
16. Com. Recived from Vivek Worker Rs. 25,000/- in cash

Mr. RAJENDRA KUMAR is ownar of the company his Capital opening balance is Rs. - 25,24,125/-
(2). Company has taken Loan privious year, there opening Balance is (a). ICICI Bank - 5,67,124/- (b). HDFC Bank - 2,15,724/-
(3). Com. has to Pay of privious year - (a). Kelash Chand & Com. - 5,00,000/- (b). Sunjay Sinhg & Com. - 2,25,000/- (c). Singh & Com. - 2,25,000/-
(4). Company has Opening Stock:- ITEM NAME Qun. Rate Unit 1. Ashirwad Aata(5kg) 490 50/- Pkt. 2. Ashirwad Aata(10kg) 513 95/- Pkt. 3. Swastik Aata (5kg) 123 51/- Pkt.
4. Swastik Aata (10kg) 50 95/- Pkt.
5. Madhushree Tea(50gm) 500 7/- Pkt.
6. Madhushree Tea(100gm) 1000 13.50/- Pkt.
7. Madhushree Tea(250gm) 700 31/- Pkt. 8. Madhushree Tea(500gm) 425 60/- Pkt.
9. Madhushree Tea(1Kg) 200 95/- Pkt. 10.Tata Tea (100gm.) 1000 13/- Pkt
11. Tata Tea(500gm.) 1000 75/- Pkt.
12. Zotex(100ml.) 2000 110/- Nos.
13. Spicy Cool(100ml) 300 85/- Nos.
14. Zotex(200ml.) 500 195/- Nos.
15. Java(50ml.) 200 45/- Nos. 16. Java(100ml.) 300 60/- Nos.
17. Axe(100ml.) 500 125/- Nos. 18. Axe(200ml.) 200 210/- Nos.
19. Rexsona(100ml.) 1000 135/- Nos.
20. Rexsona(200ml.) 500 225/- Nos.
21. Lux Soap(75gm.) 2500 9.75/- Nos.
22. Lux Soap(100gm.) 1500 14.13/- Nos.
23. Lux Soap(125gm.) 1000 15.50/- Nos.
24. Breez(100gm.) 5000 6.00/- Nos.
25. Dove Soap(100gm.) 500 21/- Nos.
26. Dove Soap(200gm.) 500 40/- Nos.
27. Pears Soap(100gm.) 225 25/- Nos.
28. Ni,a Soap(100gm.) 200 6.50/- Nos.
29. Dabaur Awala(100ml.) 250 17/- Nos.
30. Dabaur Awala(200ml.) 250 31/- Nos.
31. Paracute Oil (100ml.) 500 15/- Nos.
32. Paracute Oil (200ml.) 600 25/- Nos.

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33. Shanti Awala(100ml.) 500 15/- Nos.
34. Vatika Hair Oil (100ml.) 250 61/- Nos.
35. Sunsilk Shempoo(100ml.) 50 20/- Nos.
36. Sunsilk Shempoo(200ml.) 50 51/- Nos.
37. Clinic Plus(100ml.) 100 30/- Nos. ....Cont 15
38. Clinic All Clear(100ml.) 100 35/- Nos.
39. Clinic All Clear(200ml.) 100 60/- Nos.
40. Chik Shempoo(100ml.) 25 25/- Nos.
41. Chik Shempoo(50ml.) 500 13/- Nos.
42. Ayur Shempoo(50ml.) 500 15/- Nos.
43. Ayur Shempoo(100ml.) 500 28/- Nos.
44. Vatika Shempoo(100ml.) 200 40/- Nos.
45. Vatika Shempoo(200ml.) 100 70/- Nos.
46. Parle-G(100gm.) 5000 3.88/- Pkt.
47. Parle-G(250gm.) 2000 12/- Pkt.
48. Krack Jack (100gm.) 1000 5.00/- Pkt.
49. Krack Jack(250gm.) 500 12/- Pkt.
50. Fair & Lovely(50gm.) 250 22/- Pkt.
51. Ayur Cold Creem(50gm.) 200 30/- Pkt. (5). Com. has some fixd Assets, there Opening balance:-

(i) Maruti Swift - 2, 13,232/-
(ii) Lang & Building - 13, 52,232/-
(iii) Furniture - 5,00,000/-

6BCAOE6- OPEN ELECTIVE

Choose form the list given from this department or from other department

Credit:3

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OPEN ELECTIVES OFFERED BY DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS AT UNDERGRADUATE LEVELS

CSAOEUG(A) - FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY

CREDIT 3 : LTP (2:1:0)

Course Objectives

The objective of this course is to

- Making the students understand and learn the basics of computer how to operate it.
- To make familiar with the part and function of computer, its types , how to use
- To know the place of computer in our day to day life, its characteristics, its usage, Limitations and benefits etc.
- To Know about software, its type and its uses
- To understand the use of communication and IT
- Provide an orientation about the increasing role of management information system in managerial decision making with the help of computers and how information is processed, stored and utilized.

UNIT – I

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

UNIT – II

Input/Output & Storage Units-:Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk , Blue Ray Disc, SD/MMC Memory cards,

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Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

UNIT – III

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux.

Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention.

UNIT – IV

Use of communication and IT , Communication Process, Communication types-Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN - Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

Internet-Evolution, World Wide Web Internet Services, Convergence of technologies.

UNIT-V

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages.

Computer Applications in Business-Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing.

Use of computers in common public services and e-governance.

Expected Outcome

At the end of this course student is able to

- Identify all the parts and main function of computer.
- Acquaint the students with the application of computers in understanding latest trends in information technology.
- Knowledge about software, its type and its uses

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- describe the use of communication and IT
- understand the increasing role of management information system in managerial decision making with the help of computers and how information is processed, stored and utilized.

TEXT & REFERENCE BOOKS :

- Pradeep K Sinha, Priti Sinha, Computer Fundmentals, Sixth Edn. BPB Publications
- S.K.Basandra, "Computers Today ", Galgotia Publications.
- Alexis Leon & Mathews Leon, " Fundamentals of Information technology ", Vikas Publishing House, New Delhi.
- V.Rajaraman, Neeharika Adabala, Computer Fundamentals, PHI

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CSAOEUG(B) - OFFICE AUTOMATION & PC PACKAGES

CREDIT 3 : LTP (2:0:1)

Course Objective s

The course objectives is

- To familiarize student with various office automation software and component of Office automation.
- To make him comfortable to evaluate, select and use office productivity software appropriate to a given situation.
- To make him work on free software for office automation on various platforms.
- To develop expertise in word processing, spreadsheet, and presentation skills.

Note - The practical exercise may be perform either using Libre Office or Open Office.

UNIT - I

Introduction to Office Automation Suit, Elements of office suit & area of use. Word-processing, Spreadsheet, Presentation graphics, Database. Introduction of various office suites Open Office, Libre Office, WPS office, Microsoft office.

Word Basics Using Open Office : Starting word processor, The parts of a word processor window , Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Formatting Your Text and Documents: Auto format, Text Attributes, Paragraph and Page Formatting, Line spacing, Margins, Borders and Shading, Tabs and Indents , Text Editing using various features , Bullets, Numbering, Working with Styles, Printing & various print options , Spell Check Working with Headers and Footers:

Tables: Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width .

UNIT - II

Graphics: Importing graphics, Clipart, Insert picture, Clip Art Gallery, using drawing features, drawing objects, text in drawing. Templates: Template types, using templates, exploring templates, modifying templates. Macros: Macro, Recording macros, editing macros, running a macro.

Mail Merge: Mail Merge concept, Main document, data sources, merging data source and main document.

UNIT - III

Spreadsheet Basics: Overview of Spreadsheet features, Getting started, Creating a new worksheet,

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Selecting cells, Entering and editing text, Entering and editing Numbers, entering and editing

Formulas, Referencing cells, moving cells, copying cells, sorting cell data, inserting rows, inserting columns, Inserting cells, Deleting parts of a worksheet, clearing parts of a worksheet.

Formatting: Page setup, changing column widths and Row heights, auto format, changing font sizes and Attributes, centering text across columns, using border buttons and Commands, changing colors and shading, hiding rows and columns. Introduction to functions: Parts of a functions,

UNIT - IV

Function in the spreadsheet Examples functions by category: Data and time functions, Engineering functions, Math and Trig functions, Statistical functions, Text functions.

Spreadsheet Charts: Chart parts and terminology, Instant charts with the chard wizard, creation of different types of charts, printing charts, deleting charts, Linking in spreadsheet

Spreadsheet Graphics: Creating and placing graphic objects, Resizing Graphics, Drawing Lines and Shapes.

UNIT - V

Creating Presentations: Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

Course Outcome

After completing the course the student shall be able to Work effectively with a range of current, standard, Office Productivity software applications.

Text & Reference Books

- www.openoffice.org/documentation/manuals/.../0100GS3-GettingStartedOOo3.pdf
- Open Office for Dummies (https://whc.es/OpenOffice%20org%20For%20Dummies.pdf)
- https://www.libreoffice.org/get-help/documentation/
- Libre Office 5.1 Writer, Calc, Math Formula Book- Vol 1 by Lalit mali

Lab Experiment on Word Processing Package

Type the following Paragraph as given.

"My Dream career"

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My ambition of life is to become a doctor. I have taken up scince and hygiene as optsional subjects. When I joint college, I shall take up medical group. I shall appear in the P.M.T. examinationn to qualify for joining a Medical College. After parssing the P.M.T., I shall joinn the medical college to become a doctor.

I would like to be a doctor. My country has become fre, Governmment has decided to uproot the diseases from the country and improve the health of the people. Hospitals are being opened for this purpose. There is great demand for doctor. Takingg all these things into considaration. I have made up mind to become a doctor.

I do not want to be clerrk. This line does not suit me. I do not want to be a teacher. Law is not a paying profession these days so becoming lawer is not my goal.

2. Correct any spelling errors displayed in the given text.

3. Save the document as <My Dream >_W01.

4. Change the layout of the page as given below.

>Page size: A4 (8.27" x 11.69") >Page orientation: Landscape

5. Change the page margins as follows:

>Top: 1.25" >Bottom: 1.25" >Right: 1.25" >Left: 1.25"

6. Format the entire document as given below.

>Line spacing: 1.15" >Font: Times New Roman >Font size: 14

>Align: Justify

7. Select the heading "Academy award" and format it as given below.

>Font color: blue >Style: Bold and underline >Align: Center

>Change all the letters to UPPERCASE

8. Make the first letter of the paragraph larger and fall into three lines (Drop cap).

9. Format the heading "My Dream career" with Style: Heading 2.

10. Create a bulleted list for the last paragraph lines of document.

11. Enter "My Document Tutorial" text as the heading of the table and format it to get the following output using a Wordart. (Font: Arial Black, Font size: 16, Align: Center)

12. Insert a footer with the following formatting options.

>Caption: <My First Document> >Font: Times New Roman >Font size: 12

13. Insert the W01 image given in the "Resources" directory, to the right hand side of the bulleted list of the document.

14.Prepare your class time table using and Format the entire table as given below.

> Change the cell size of the table to Auto Fit to Contents. >Align: Center

15. Select the Heading row and format it as given below.

> Convert all text in to capital letters >Style: Bold >Align: Center

16. Insert a new row just below the last row of the table and enter the following information into the new

row: > Saturday : Special Lecture on Cloud computing > Merging all the column.

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17. Send a Call Letter for All Applicants to Inform Interview Details using Mail Merge Base

Spreadsheet Experiment

1. Create a blank Spreadsheet in and save it as "<Your Index no>_E01".
2. Create a table with 7 rows and 8 columns in the cell range A3:H9.
3. Insert a title "Vivekanand College " and a sub title "Mark sheet for A/L Biology - Class A", by centering it with the table, making the text bold, and changing the font size 16 for main title and 14 for subtitle.
4. Enter data of 6 students under the columns, "Roll No", "Name", "Physics", "Chemistry", "Biology", and "English".
5. Use the relevant formula to calculate the total marks and average and copy the formula to the relevant cells.
6. Format the "Average" column with two decimal places.
7. Use conditional formatting to change the color of the cells of which the average mark is more than 60, into green.
8. Select the columns, "Roll No", "Physics", "Chemistry", "Biology", and "English" column and draw a column chart.
9. Insert the title, "Vivekanand College ", and the sub title, "Mark sheet for A/L Biology - Class A" to the top of the chart.
10. Set the X axis labels with the index numbers.
11. Label the X axis title as, "Roll No" and Y axis title as, "Marks".
12. Label the legends for 4 subjects, "Physics", "Chemistry", "Biology" and "English".
13. Make sure to get a graph similar to the one given below.

Presentation Experiments

1. Create a presentation with four blank slides.
2. Modify the presentation as follows.
   a) Insert a suitable design template.
   b) Insert a footer to show Your name and your Student ID.
   c) Insert Today' s date as a fixed date in the date area.
   d) Make necessary changes to appear slide numbers in the slide number area.
   e) Make necessary changes so that the footer, date and the slide number do not appear on the title slide (first slide).
3. Add content to the title slide (first slide) by following the instruction given below.
   a) Type "River" as the slide title and it' s format should be Font Type: Arial, Style: Bold, Size:96, Color: Black [10 marks]
   b) Type "Our Life Support" as the sub title and insert an image from the resources directory to a suitable location.
4. Add content to the second slide by following the instruction given below.

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a) Type the slide title as, "Rivers of North India" and format it as,
Font Type: Arial, Style: Bold, Size: 44, Color: Black

b) Insert the following content as shown below.
The Ganga
Indus
Bamhaputra

5. In the third slide, add the following components.
   a) Type the slide title as, "Tributaries"
   b) Insert Rivers and their tributaries of slide 2 in a table.
   C) Insert few more important Rivers of India with their regions.
6. Add the following animation effects to your presentation.
   a) Apply emphasis animation effect to each main point and sub point in the second slide.
   b) Apply sound effect when the second slide appears in the slideshow.
   c) Hide the fourth slide from the slide show.
   d) Save your presentation with the following file name <Rivers_of _North india>_ P01.

CSAOEUG(C) - MULTIMEDIA

CREDIT 3 : LTP (2:0:1)

Course Objectives

The objective of this course is to provide students with a basic understanding of multimedia systems and its components.

This course focuses on topics in multimedia information representation and multimedia standards in the components of multimedia – Text, audio, image, video and animation.

Provide information about the standards tools and techniques used in development of multimedia components for productions

Create simple multimedia applications and products for using standalone, networked or web based computers.

UNIT - I

Introduction To Multimedia , Needs and Areas of use, Identifying Multimedia Elements - Text, Images, Sound, Animation and Video, Making Simple Multimedia With PowerPoint.

TEXT - Concepts of Plain & Formatted Text, RTF & HTML Texts, Using Common Text Preparation Tools, Conversion to and From of Various Text Formats, Creating text using standard software.

UNIT - II

SOUND - Sound and its Attributes, Sound and Its Effects In Multimedia, Frequency, Sound Depth, Channels and its Effects on Quality and Storage, Size Estimation of Space of a Sound File, Sound Card Standard – FM Synthesis Cards, Waves Table Cards, MIDI and MP3 Files and Devices, 3D Sounds, Recording and editing sound using sound editors like Audacity, Sound forge etc.

UNIT - III

IMAGES - Importance of Images Graphics in Multimedia, Vector and Raster Graphics, Regular Graphics vs. Interlaced Graphics, Image Capturing Methods - Scanner, Digital Camera Etc. Color models-RGB, CYMK, Hue, Saturation, and Brightness, Various Attributes of Images Size, Color, Depth Etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF Format Their Features And Limitations, Image format conversion, various effects on images. Create images using Photoshop, CorelDraw and apply various effects, Using Layers, Channels and Masks in images.

UNIT - IV

VIDEO- Basic of Video, Analog and Digital Video Type of Video , Digitization of Analog Video, Video Standard – NTSC, Pal, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, MJPG, MPEG, Video Editing and Movie Making Tools, converting formats of videos, recording and editing videos using video editing software like adobe premiere or Sony Vegas.

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UNIT - V

ANIMATION- Concepts of animation, 2D and 3D animation, tools for creating animation, character and text animation, creating simple animation using GIF animator and flash, Morphing and Applications.

Authoring tools for Multimedia – Introduction to various types of multimedia authoring tools, CD/DVD based and web based tools, features and limitations, creating multimedia package using all components.

Course outcome

After completing the course student will be able to –

- Define multimedia and its components
- Create simple multimedia product that include all components
- Use standards software tools to develop multimedia components and integrate all components as per the requirement

Text & Reference books

- Introduction To Multimedia by Ramesh Bangia, Laxmi Publications Pvt. Ltd 2015
- Multimedia: Making It Work, Ninth Edition, by Tay Vaughan, Tata Mc-Graw Hill
- Introduction To Multimedia Systems, by Bhatnager G., Elsevier
- Level Introduction to Multimedia (M4.2-R4) by Satish Jain, Bpb Publications

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CSAOEUG(D) - PYTHON PROGRAMMING

CREDIT 3 : LTP (2:0:1)

Course Objectives

- Demystify programming, enjoy python scripting
- Discover python lexical features and syntax
- Learn core python structures and flow control
- Create and run python functions
- Practice with python execution environment
- Explore the python library
- Implement data structures using python
- Explore object-oriented programming
- Understand handling of errors and exceptions
- Explore test and debug python best practices

UNIT - I

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Overview of Programming: Structure of a Python Program, Elements of Python

UNIT - II

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator)

Creating Python Programs :Input and Output Statements, Control statements(Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments, Errors and Exceptions.

Iteration and Recursion: Conditional execution, Alternative execution, Nested conditionals, The return statement,

UNIT - III

Recursion, Stack diagrams for recursive functions, Multiple assignment, The while statement, Tables, Two-dimensional tables

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Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, A find function,

UNIT - IV

Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists

Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries.

UNIT - V

Data Structures: Arrays, list, set, stacks and queues.

Searching and Sorting: Linear and Binary Search, Bubble, Selection and Insertion sorting.

References :

1.T. Budd, Exploring Python, TMH, 1st Ed, 2011

2.How to think like a computer scientist : learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.

1. http://docs.python.org/3/tutorial/index.html
2. http://interactivepython.org/courselib/static/pythonds

Practical:

1. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
2. Using while loop, produce a table of sins, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x).
3. Write a program that reads an integer value and prints "leap year" or "not a leap year".
4. Write a program that takes a positive integer n and then produces n lines of output shown as follows. For example enter a size: 5

   *
   **
   ***
   ****
   *****
5. Write a function that takes an integer 'n' as input and calculates the value of 1 + 1/1! + 1/2! + 1/3! + ... + 1/n
6. Write a function that takes an integer input and calculates the factorial of that number.
7. Write a function that takes a string input and checks if it's a palindrome or not.
8. Write a list function to convert a string into a list, as in list ('abc') gives [a, b, c].
9. Write a program to generate Fibonacci series.
10. Write a program to check whether the input number is even or odd.

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11. Write a program to compare three numbers and print the largest one.
12. Write a program to print factors of a given number.
13. Write a method to calculate GCD of two numbers.
14. Write a program to create Stack Class and implement all its methods. (Use Lists).
15. Write a program to create Queue Class and implement all its methods. (Use Lists)
16. Write a program to implement linear and binary search on lists.
17. Write a program to sort a list using insertion sort and bubble sort and selection sort.

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CSAOEUG(E) - INFORMATION SECURITY BASICS

CREDIT 3 : LTP (2:0:1)

Course Objectives

- To Prepare Students to understand Security basics
- Understand Cryptography and comprehensive study of the principles and practices of computer system security
- Understand operating system security, network security, software security and web security.
- Understand common attacking techniques such as virus, trojan, worms and common security policies and the basic cryptography,
- Understand ethical issues in computer security.

UNIT – I

Introduction Security, Attacks, Computer Criminals, Security Services, Security Mechanisms.

Cryptography,Substitution Ciphers, Transpositions Cipher, Block Cipher, Stream Cipher, Confusion, Diffusion, Symmetric key, Asymmetric key, Encryption. DES Algorithm, Hash function, Digital Signatures, Digital Certificates. Program Security , Program Errors, Malicious Codes Virus, Trap doors, Salami Attacks, Covert channels, Control Against program.

UNIT - II

Threats, Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication. Database Security, Requirements, Reliability, Integrity, Sensitive Data, Inference, Multilevel Security, Types of Cyber Crimes.

UNIT - III

Security in Networks, Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails, Administrating Security Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data, IT law.

Expected Outcomes

The students shall be able to understand

- The common threats faced today,
- Foundational theory behind information security,
- The basic principles and techniques when designing a secure system,
- Attacks and defenses work in practice,

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- Assess threats for their significance.
- System protections and limitations.

TEXT BOOKS:

- C P. Pfleeger, S. L. Pfleeger; " Security in Computing" Prentice Hall of India, 2006
- W. Stallings "Network Security Essentials: Applications and Standards", 4/E, 2010

REFERENCE BOOKS:

- William Stallings " Cryptography and Network Security Principles and Practices " 4/E , Prentice Hall

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CSAOEUG(F) - VBA PROGRAMMING

CREDIT 3 : LTP (2:0:1)

Course Objectives

The course objective is -

- To Know the powers of Visual Basic for Applications (VBA, Macros)
- Understand the use of automate common and repetitive keystrokes
- Build powerful automated business tools quickly using VBA
- Speed up your production and reduce the time you have to spend staring at an electronic spreadsheet each day.

UNIT - I

Introduction to VBA - Introduction to Excel , Introduction to Programming , VBA Overview and the IDE , Quick Review of Macros , Working with Macros , How to use Visual Basic Editor (Programming Environment), Advantages of VBA.

Understanding the VBA Editor, Module & Procedures - The Visual Basic Editor , Parts of the VBA Editor , Modules and Macros , About VBA Forms, Sub Procedures & Modules , Creating Forms , Using Controls and their Properties , Running VBA Forms in Excel

VBA Syntax & Grammar - Objects – The Grammar , Using Properties and Methods , Understanding Parameters , The Object Browser , Understanding object hierarchy , Tools for better coding , Moving to Other Cells , Editing Specific Cells.

UNIT - II

Variables, Arrays & Constant - Using the Immediate Window , Gaining greater control through the immediate window , Formatting Cells , Using Variables , Constants , Object Variables , Dimensioning and usage of variables , Displaying data and obtaining data from the user

Storing Data in Variables - How and when to declare variables , Selecting data types , Fixed and dynamic arrays , Constants

Control Structure & Program Flow - IF (ElseIf, Else) , Select Case() , For Next Loop , For Each Loop() , Do Until Loop and Do While Loop , With, End With , Nesting Code.

UNIT - III

Building Procedures - Creating Sub and Function procedures , Calling procedures , Passing arguments to procedures

Building intuitive user interface - Communicating with the user through the message box , Gathering user information with the input box , Utilizing the File Dialog object and Dialogs collections

Creating Customized Dialog Boxex with User Form Objects - Command buttons , List and Combo boxes , Labels , Option buttons , Check boxes , Text boxes , Frames , Adding more functionality with advanced ActiveX control

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Fonts & Backgrounds - Using Font Property in cells , Using Various Background Properties in Excel VBA , Creating a Counter , String Handling , Using Left, Right, Instr, Mid and Len Functions in VBA , Range Selection and Manipulation

UNIT - IV

Objects & Collections - Workbook and Worksheet Object , Range Object and Cell Properties , Methods and Properties , Assigning Objects , Using Name Arguments

Array - What is Array& why use array , Declaring an Array , Sorting Data in Array , 2-Dimention Array , Dynamic Array , UBourd , Storing Data in a range of an Array Elements , Using various array functions

UNIT - V

Functions - Using Excel Worksheet Functions in VBA , VBA Functions , User-Defined Functions , Adding Help to User Defined Functions , Declaring Variables in User Defined Functions , Using Ranges in User Defined Functions , Creating and Managing an Add-in for User Defined Functions

Internet & Excel - Copy Hyperlinks and Text from a webpage to Spreadsheet

Interaction with other office Packages - Communicating with Word and PowerPoint using Excel VBA

Modifying Menus & Toolbars - Simplifying user interaction with the Command Bar object , Adding and removing CommandBarControl objects

Text & Reference book

- DUANE BIRNBAUM, Microsoft Excel VBA Programming for the Absolute Beginner Second Edition, Thomson, Course Technology
- John Green, Stephen Bullen, Rob Bovey, Michael Alexander, Excel 2007 VBA Programmer's Reference, Wrox Publishers
- Dr. Liew Voon Kiong, Excel VBA Made Easy ebook

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CSAOEUG(G) - RDBMS USING MYSQL

CREDIT 3 : LTP (2:0:1)

Course Objectives

- Establish a basic understanding of the analysis and design of a database.
- Establish a basic understanding of the process of Database Development and Administration using SQL.
- Enhance Programming and Software Engineering skills and techniques using SQL.
- Establish a basic understanding of background materials needed for technical support using SQL.

UNIT - I

Introduction to MySQL, Installing MySQL - MySQL Installation, Windows Installation, Linux RPM Installation, Linux Binary Installation, Source Installation

Starting and stopping MySQL - Four different methods to start MySQL in Linux, MySQL Stopping, Basic MySQL Queries, DML Queries, DDL Queries, TCL Queries, Types of Joins, Unions

Various logs in MySQL and its uses- MySQL Logs, Error Log, Query Log, Slow Query Log, Binlog and its format, Relay Log

UNIT - II

MySQL client Programs - MySQL Server/Client Architecture, MySQL Client Programs, MySQL Commands, MySQL Non-Client Programs, Upgrading MySQL, Why Upgradation? , Checklist MySQL Upgradation

Mysqladmin commands- MySQL Admin Commands, Workbench MySQL

Locking in MySQL- Locking in MySQL, Internal Locking, Table level Locking, Row level Locking, External Locking, Dead Lock

UNIT - III

MySQL Table maintenance - Table Maintenance, Analyze Table, Backup Table, Check Table, Checksum Table, Optimize Table, Repair Table, Restore Table, Moving Tablespace

Information Schema and Performance Schema - MySQL Information schema, Tables in Information schema, MySQL Performance schema

MSQL backup and Recovery- MySQL Backup, MySQL Backup Types, MySQL backup factors, MySQL Backup Tools, MySQL Dump, MySQL Recovery, MySQL Recovery Factors, Load data infile & select into outfile

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UNIT – IV

MySQL Replication and different Replication Architecture - MySQL Replication, MySQL Replication Architecture, MySQL Replication Basics, MySQL Replication Types, Master-Slave Replication Setup, Master-Slave Replication Filters, Master-Master Replication

MySQL User Management and Routines &Triggers - User Account Management, User Privileges, Administrative Privileges, Database Access Privileges, Creating and Rename User Account, Drop User Account, Grant Privileges, Revoke Privileges, Routines and Triggers

UNIT - V

MySQL Resource allocation - MySQL Memory Consumption, MySQL Memory Limitations,

Securing MySQL - Operating System Security, File System Security, Log Files & Security, Network Security, Optimizing queries, Identifying Candidate, Using EXPLAIN, Using Show Warnings

Course Outcome

Solve Database problems using Oracle 9i SQL by applying SQL commands to

- Create, Insert, Update, and Retrieve a simple database.
- Understand the services provided by a Database Management System.
- Understand the use and application of the Relational Database Model.
- Understand Transaction Processing and Multi-user Database support.
- Understand the difference between a Production transaction database and a Data Warehouse.
- Understand the Client/Server structures used in Database Management Systems.
- Design and Implement a basic database using the Oracle Database Management System.

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CSAOEUG(H) - LINUX & SHELL PROGRAMMING

CREDIT 3 : LTP (2:0:1)

Course Objectivess:

This course will prepare students to understand Linux/UNIX environments. This course will also prepare students for shell programming and Linux System Administration .

UNIT – I

Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell, Linux standard directories.

Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less.

UNIT–II

Creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces.

Essential linux commands Understanding shells, Processes in linux - process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing.

UNIT–III

managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands -wc, cut, dd, etc.

Mathematical commands- bc, expr.

UNIT - IV

Creating and editing files with vi & vim editor.

Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords

Creating Shell programs for automate system tasks.

UNIT - V

Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

awk and sed

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Expected Outcomes

- Understanding the basic set of commands and utilities in Linux/UNIX systems.
- Understand the inner workings of Linux like operating systems.
- Obtain a foundation for an advanced course in operating systems
- Able to writing shell script
- Understand back ground and fore ground Process
- Understand Linux System Administration

TEXT BOOKS

- Sumitabha Das "Unix - Concepts & Applications " (Third Ed.) Tata Mcgraw Hill Publications.
- Graham Glass & King Ables, "Unix for Programmers and Users" (Third Ed.) - Pearson Education India.(Low Prices Edition)

REFERENCE BOOKS:

- Cristopher Negus "Red Hat Linux 9 Bible" IDG Books India Ltd.
- Jack T Ackett, David Gunter " Using Linux" PHI , EEE Edition
- Nicholas Wells "Linux Installation and Administration" Vikas Publishing, New Delhi
- Yashwant Kanetkar "Unix Shell Programming" BPB Publications,
- Red Hat Linux Unleashed Techmedia (Bpb Publications)
- Wells "Linux Networking and Security" Vikas Publishing, New Deihi

LIST OF PRACTICALS – Linux & SHell Programming

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify "cal" command to display calendars of the specified months.
6. Write a shell script to modify "cal" command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – "Entered login name is invalid".
8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users .
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
12. Write a shell script to find the sum of digits of a given number.
13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
14. Write a shell script to find the LCD(least common divisor) of two numbers.

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15. Write a shell script to perform the tasks of basic calculator.
16. Write a shell script to find the power of a given number.
17. Write a shell script to find the factorial of a given number.
18. Write a shell script to check whether the number is Armstrong or not.
19. Write a shell script to check whether the file have all the permissions or not.
20. Program to show the pyramid of special character "*".

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CSAOEUG(I) - WORKING WITH OS (DOS, WINDOWS & LINUX)

CREDIT 3 : LTP (2:0:1)

Course Objectives

This course will prepare students to understand and give working knowledge of three most popular O.S. DOS, Windows and Linux. Students are expected to work on these environments and do the work seamlessly

UNIT - I

Fundaments of operating system, definition and need. Main Services of operating system, various types of operating system, (definition and characteristics), multitasking, multiprocessing, multiprogramming, real time, time sharing, parallel, network operating system, booting process, file system.

DISK OPERATING SYSTEMS (DOS) - Introduction, History & versions of DOS DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files.

DOS commands: Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc.

External Commands - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc

UNIT - II

WINDOWS - Introduction to Windows, its various versions and features. Hardware requirements for various versions of Windows. Working with Windows **(Windows 10 or latest version)** Windows concepts, Windows Structure, Desktop, Taskbar, Start Menu, Working with files and folders, create, copy, delete, renaming and moving files and folders, working with recycle bin-restoring deleted files, emptying the recycle bin, searching files and folders .My computer, formatting floppy disks, Using CDROM Disk and Dives.

Using Windows Accessories programs- Calculator, Notepad, Paint, WordPad, Character map, Paint, Command line.

Using Media Player, Sound Recorder, Volume Control. Taking Printout from programs, Printer Properties, Add fonts to Windows (Specially adding Hindi Fonts and using them). Setting up Regional and Language settings in Windows.

Advanced features of Windows -Managing Hardware & Software – Add or remove Hardware devices to/from computer, Add/remove programs, Using Scanner, Web camera, sharing of printers.

UNIT - III

System Tools - Backup, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information windows update.

Communication – Setting up Dial up Networking with Windows, Internet connection with Windows, Direct Cable Connection, Setting up TCP/IP properties, Hyper Terminal, Phone Dial ,Browsing the Web with internet explorer, communication through Outlook Express, Multiple Users Features of Windows. Creating and deleting user, changing user password etc. Accessibility Features of Windows.-Sharing Information between Programs, sharing folders and drives browsing the entire network, mapping windows shared drives, Using shared printers - Understanding OLE - Embed/Link Using Cut and Paste and Embed/Link Using Insert Object - Manage Embedded/Linked Object.

UNIT - IV

LINUX - Linux introduction, Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell, Linux File system-Boot block, super block, Inode table, data blocks, Linux standard directories. Partitioning the Hard drive for Linux, Installing the Linux system, System, startup and shut-down process, init and run levels.

Essential linux commands Understanding shells, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces.

UNIT - V

Process fundamentals, connecting processes with pipes, tee, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc. Mathematical commands- bc, expr, factor, units, Creating and editing files with vi, joe & vim editor

Course Outcome

After completing the course student will operate easily all three most popular O.S. DOS, Windows and Linux.

Text & Reference Books

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CSAOEUG(J) - SOFTWARE ENGINEERING

CREDIT 3 : LTP (2:1:0)

Course Objectives

The purpose of this course is to make the students capable of conceiving and developing complete software projects. It objects at software modeling, project planning, design as well as improving the quality and usage of software.

UNIT - I

Software : Software Characteristics and Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model, Incremental Model and Spiral Model. Project Metrics : Software Measurement– Size Oriented, Function Oriented Metrics, Extended Function Point Metrics.

UNIT - II

Software Project Planning: Objectives, Decomposition Techniques, and Empirical Estimation Models. Analysis Concept and Principles: Requirement Analysis, Analysis Principles.

UNIT – III

Design Concepts and Principles: Design Process, Design Concepts, Design Principles, Effective Modular Design, Human Computer Interface Design, Interface Design Guidelines.

UNIT – IV

S/W Quality Assurance: Quality Concepts, Reliability S/W Testing Models: S/W Testing Fundamentals, White and Black Box Testing, Basic Path Testing, Testing Strategies: Strategic Approach to S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing.

UNIT - V

S/W Reuse: Reuse Process, Classification and Retrieving Components, Economics of S/W Reuse

Software maintenance- Need for Software maintenance, Maintenance models.

Software Configuration Management (SCM) – Version Control – SCM process – Software Configuration Items

Computer Aided Software Engineering (CASE): Introduction to CASE, Taxonomy of CASE Tools

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Expected Outcomes

At the end of this course, a student will have detailed knowledge of aspects of software engineering, for better and documented development of software projects in an efficient manner.

TEXT & REFERENCE BOOKS :

- Software Engineering By R.S.Pressman
- An Integrated Approach To Software Engineering By PankajJalote

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