3rd Semester:

BCA – 301: Fundamentals of Management & Business Accounting

Total Lectures = 50

Unit – I: Concept: Nature, Functions of Managers, Management: Arts Vs Science, Evolution of Management Thoughts, Functions of Management.

Unit II:- Types of Control, Steps involved in Control Process, Meaning and importance of the study of Organisational Behaviour. Improving inter-personal effectiveness, inter-personal communication [6 Lect.]

Unit – III: Introduction of Accounting- Basics of Accounting- Meaning of Accounting and Accounting Cycle, Users of Accounting Information and Their Needs, Objectives, Types of Accounting Information, Advantages, Limitations, and Branches of Accounting, Basic Accounting Terminology,

Unit-IV: Double Entry System of Book Keeping, Accounting and Economic Concept of Income, Computation of Accounting Income and economic Income.

Unit – V: Journalising, Posting and Balancing

Financial Statements- Meaning, Usefulness, Elements of Financial Statements, Manufacturing Accounting, Trading Account, Profit & Loss Account, Balance Sheet (Position Statement), Distinction Between Manufacturing Account and Trading Account, Trial Balance.

Unit-VI:- Use of Computers in Accounting – Meaning, Capability and Role of Computers in Accounting, Computer Terms

Text Books:

1. Principles and Practices of Management by L.M.Prasad
2. Essentials of Management by Harold Koontz & Oddonell
3. Organisation and Management by R.D.Agrawal
4. Organisation Behaviour by Fred Luthens
5. Management of Organisation Behaviour – Harshey & Blanchard
6. Financial Accounting, P.C.Tulasyan, 24 Ed. Pearson
7. Modern Accountancy – A. Mukherjee & M. Hanif
8. Advance Accountancy – J.R.Batliboi.
9. Comprehensive Accountancy – S.A.Siddiqui, Laxmi Publ.

BCA – 302: DATABASE MANAGEMENT SYSTEM

Total Lectures = 50

Unit - I Introduction: Database and Database Users, Characteristics of the Database Approach. Structure, Function and Components of DBMS, Different people behind DBMS, Advantages of using DBMS. Database System Concepts and architecture: Data Models, Schemas, and Instances. DBMS 3-Level ANSI/SPARC Architecture and Data Independence. Types of DBMS.

Unit - II Data Models: Entity-Relationship Model: Entity types, Entity sets, attributes, and Keys, ER Model Concepts, Notation for ER Diagrams, Reducing E-R Diagrams to tables. Abstraction-Generalisation, Specialisation, and Aggregation. Cardinality and Modality. Exercises

Unit – III: Relational Data Model: Structure and properties of relational model, Relation, Attribute, Tuple, Keys: Super, Primary, Candidate, Alternate, and Foreign keys. Relational Algebra: Union, Intersection, Difference, Cartesian Product, Division, Join.
Introduction to Network and Hierarchical Data models

Unit - IV Functional Dependencies and Normalization for Relational Database: Functional Dependencies and its types, Axioms for FDs, Decomposition Rules, Different Normal Forms: 1NF, 2NF, 3NF, BCNF, Multi-valued dependencies – 4NF and 5NF, DKNF

Unit – V Relational Database Language: Data definition in SQL, DDL Commands, DML Commands, Queries in SQL- Simple Queries, Nested Queries, Aggregate Functions, Insert, Delete and Update, Views in SQL, Specifying General Constraints as Assertions, specifying indexes.

Unit–VI: Transaction Processing Concepts: Introduction, Transaction and System Concepts, Desirable (ACID) properties of transaction, Recovery Techniques: Log-based, Check-points and Shadow paging, Serializability of schedules, Problems with concurrency, Concurrency Control, Locking Techniques, Lock types, Granularity of Locking, Concurrency Control based on time stamp ordering.

Text book: 1. Remez Elmaseri and Shamkant B. Navathe, "Fundamentals of Database Systems", 5th Ed., Pearson Education, 2007.
2. Shio Kumar Singh, "Database Systems-Concepts, Designs and Application", 2011. Pearson.
3. A. Silberschatz, Henry. F. Korth, S. Sudarshan, "Database System Concepts" 6th Ed, McGraw Hill, 2012.
4. Bipin C. Desai, "An Introduction to database systems", Galgotia Publications
5. C.J.Date, A. Kannan, S. Swamynathan, "Introduction to database systems", Pearson, 2013.
6. Alexis Leon & Mathews Leon, "Database Management Systems", Vikas Publ.
7. Atul Kahate, "Introduction to Database Management Systems", Pearson Education.
8. Prateek Bhatia, Gurvinder Singh, "Simplified Approach to DDBMS", Kalyani Publ.
9. Rini Chakrabarti, s. Dasgupta, S. K. Shinde, "Advanced Database Management Systems", Dremtech Press, 2014.
10. Arun K Majumdar, Primoty Bhattacharya, "Database Management Systems", McGraw Hill

BCA – 303: Object Oriented Programming using C++

Total Lectures = 50

Unit - I:

Object oriented programming concepts Why do we need object oriented.

C++ Programming basics: Output using ***cout***. Directives. Input with ***cin***.

Type ***bool***, The ***setw*** manipulator, Type conversions.

Unit - II

Functions: Returning values from functions, Reference arguments, Overloaded function, Inline function, friend function, Static function, Default arguments, Returning by reference.

Unit - III:

Object and Classes: Making sense of core object concepts (Encapsulation, Abstraction, Polymorphism, Classes, Messages Association, Interfaces) Implementation of class in C++, C++ Objects as physical object, C++ object as data types, constructor, Object as function arguments, The default copy constructor, returning object from function, Structures and classes, Classes objects and memory static class data, Const and classes.

Unit - IV:

Arrays and string arrays fundamentals, Arrays as class Member Data: Arrays of object, string, The standard C++ String class, Operator overloading: Overloading unary operations, Overloading binary operators, data conversion, pitfalls of operators overloading and conversion keywords. Explicit and Mutable.

Unit - V:

Inheritance: Concept of inheritance, Derived class and based class, Derived class constructors member function, inheritance in the English distance class, class hierarchies, inheritance and graphics shapes, public and private inheritance, aggregation: Classes within classes, inheritance and program development, Virtual Function: Virtual Function

Unit - VI:

Pointer: Addresses and pointers. The address of operator and pointer and arrays. Pointer and Faction pointer and C-types string. Memory management: New and Delete, pointers to objects, debugging pointers. Assignment and copy initialization, this pointer, dynamic type information. Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and insertion operators, memory as a stream object, command line arguments and printer output. Templates and Exceptions: Function templates, Class templates Exceptions

Text Books:

1. Programming in C++, Robert Laffore, TMH
2. Programming in C++, Ashok M. Kamthane, Pearson
3. Object Oriented Programming with C++, E. Balaguruswamy, TMH
4. C++ Programming, Maria Litvin & Gary Litvin, Vikas Publ.
5. Programming with C++, D. Ravichandran, TMH
6. Object Oriented Programming with C++, Rohit Khurana, ITESL, Vikas Publ.

BCA – 304: Numerical Methodology

Total Lectures = 50

Unit – I: Solution of a nonlinear algebraic ad transcendental equations:Bisection method, False position, Newton Raphson method, Iterative Method, Lin Bairstow's method.

Unit–II: Solution of Simultaneous linear equation: Gauss elimination, Gauss Jordan, LU decomposition, Crout's method, Jacobi, Gauss Seidel, Relaxation method, Inverse of a matrix using iterative method.

Unit – III: Finite differences: Introduction and different types of operators and relation between them. Factorial notation and Polynomial in factorial notation.

Unit – IV: Interpolation: Introduction Newton forward and backward interpolation ,Newton Divided differences, Lagrange's Interpolation, Central difference interpolation formula, Gauss forward and backward interpolation formula. Numerical differentiation.

Unit – V: Numerical Integration: Trapezoidal and Simpson's rules, weddle's rule and their order of error.

Unit – VI: Solution of ordinary differential equation:Euler's method, Euler's modified method, Runga Kutta method, Taylor's Series method, Picard's method, Adams-Bashforth method..

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Note: Students may use scientific calculator for numerical calculations of various functions (Log, Exponential, Trigonometrical, etc.)

Text Books:

1. **Jain, M.K.: Numerical method for scientific and Engg. Computations – Wiley Eastern, N.D.**
2. **Sastry, S.S.: Introduction to Numerical Analysis – PHI**
3. **V. Rajaraman: Computer Oriented Numerical Methods – PHI**
4. **Gonte de Boore – Elementary Numerical Analysis, Tata McGraw Hill**

BCA – 305: LAB ON DBMS (MS-ACCESS/SQL)

Total Lab Classes = 60

SQL Commands: DDL: CREATE, ALTER, DROP, INDEX

DML: insert, delete, update, and commands related to queries on tables – simple and nested queries- Basic data retrieval; condition specification; order by; Uses of logical operators – and, or, not; Range searching; Pattern matching; arithmetic and aggregate functions; Joining multiple tables – (Equi joins); set manipulations – Any, All, In, Exists, Union, Intersect, Minus, grouping command. Creating views.

DCL: GRANT and REVOKE

TCL: COMMIT, ROLLBACK and SAVEPOINT

Text Books:

1. SQL & PL/SQL For Oracle 11g Black Book, Dr. P.S.Deshpande, Dreamtech Press
2. Commercial Application Development using Oracle Developer 2000, Ivan Bayross, BPB Publ.
3. SQL, PL/SQL The Programming Language Of Oracle, Ivan Bayross, BPB Publ.
4. Learning Oracle SQL and PL/SQL- A Simplified Approach, Rajeeb C. Chatterjee,PHI
5. Oracle - The Complete Reference, Oracle Press, TMH Edition.
6. SQL- A Complete Reference, Alexis Leon & Mathews Leon, TMH

BCA – 306: Lab on C++

Total Lectures = 60

Program in C++ related to following topics:

Input/ Output using cin/ cout. Decision making using if else, switch case, conditional operator Looping using while, do while and for. Array - single and multi dimension. Function - simple, recursive, call by value and reference, overloading, default argument value. Class - Constructor, Member Functions. Operator overloading. Friend function. Inheritance - Single, Multilevel, Multiple.
Virtual Function. Stream handling.

1. Simple C++ Programs to Implement Various Control Structures.

Ex 1A: if .. else statement

An electricity board charges the following rates to domestic users ti discourage large consumption of energy: FOR the first 100 units - 50P per unit, For next 200 units - 80P per unit Beyond 300 units - 90P per unit. All users are charged a minimum of Rs.50.00. if the total

amount is more than Rs.300.00 then an additional surcharge of 15% is added.Write a C++ program to read the names of users and number of units consumed and print out the charges with names

Ex 1B: switch.. case statements and do .. while loop

An election is contested by five candidates. The candidates are numbered 1 to 5 and a voting is done by marking the candidate number in a ballot paper. Write a C++ program to read the ballot and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5 the ballot should be considered as a 'spoilt ballot', and the program should also count the number of spoilt ballots

Ex 1C: for loop - Write a C++ program to print the different Pyramid structures

Ex 1D: while loop Write a C++ program to print the Fibonacci series 0 1 1 2 3 5 8 13 .... By getting number of number to be displayed is given as input Eg. 5 is input value means it should print first 5 numbers 0 1 1 2 3:

2. Programs to Understand Structure & Unions.

Ex 2A: Structure Create a Structure called employee with the following details as variables within it.

1. Name of the employee, 2. Age, 3. Designation, 4. Salary

Write a C++ program to create array of objects for the structure to access these and print the name, age, designation and salary

Ex2B: Union Create a Union called student with the following details as variables within it.

1. Name of the student, 2. Age, 3. Year of study, 4. Semester, 5. 5 different subject marks in array. Write a C++ program to create object for the union to access these and print the Name, age, year, semester and grade according to their percentage of marks scored. 90 % and above – S grade, 80% to 89% -- A grade, 70% to 79% -- B grade, 50% to 69% -- C grade 50% to 59% -- D grade, <50% -- F grade

3. Programs to Understand Pointer Arithmetic.

Ex 3: Write a C++ program to find the number of vowels present in the given character array using pointer arithmetic.

Ex 4A: Write a C++ program to print the given number in reverse order. Use functions with return type and without return type for reversing the number.

Ex: given number is 2345 , output should be 5432

Ex 4B: Write a C++ program to find the sum of factorial of a given number using recursive function

Ex 5: Write a C++ program to perform different arithmetic operation such as addition, subtraction, division, modulus and multiplication using inline function

6. Programs to Understand Different Function Call Mechanism.

a. Call by reference and Call by value

Ex 6: Write a C++ program to swap two number by both call by value and call by reference mechanism, using two functions swap_value() and swap_reference respectively , by getting the choice from the user and executing the user's choice by switch-case.

7. Programs to Understand Storage Specifiers.

Ex 7: Write a C++ program to demonstrate the static and non static variable usage defining them within a function.

8. Constructors & Destructors.

Ex 8: Create a class for counting the number of objects created and destroyed within various block using constructor and destructors.

9. Use of "this" Pointer Using class

Ex 9: Write a C++ program to create three objects for a class named pntr_obj with data members such as roll_no & name . Create a member function set_data() for setting the data values and print()member function to print which object has invoked it using 'this' pointer.

10. Programs to Implement Inheritance and Function Overriding.

Ex 10A: Write a C++ program with different class related through multiple inheritance and demonstrate the use of different access specifiers by means of member variables and member functions.

Ex 10B: Write a C++ program to explain virtual function (polymorphism) by creating a base class c_polygon which has virtual function area(). Two classes c_rectangle and c_traingle derived from c_polygon and they have area() to calculate and return the area of rectangle and triangle respectively.

11. Programs to Overload Unary & Binary Operators as Member Function & Non Member Function.

Ex 11 A: Write a C++ program to count the number of persons inside a bank, by increasing count whenever a person enters a bank, using an increment(++) operator overloading function, and decrease the count whenever a person leaves the bank using a decrement(--) operator overloading function inside a class

Ex 11 B: Write a C++ program to create two objects of a class called company and add their data members using an operator overloaded function for '+' operator and '-'operator

12. Programs to Understand Friend Function & Friend Class.

a. Friend function

b. Friend class

Ex 12 B: Write a program to accept the student detail such as name and 3 different marks by get_data() method and display the name and average of marks using display() method. Define a friend class for calculating the average of marks using the method marrk_avg().

13. Programs on Class Templates

A Mini Project