JAI HIND COLLEGE - AUTONOMOUS

Syllabus for the V

Program: B.Sc.

Course: Applied Component (Computer Programming)

(Credit Based Grading System with effect from the academic year 2018–2019)

Syllabus for V Semester APPLIED COMPONENT
Computer Programming
Based on Credit Based Grading System

SEMESTER V

Course code	Title	Credits
SMAT 5 AC	Computer Programming and System Analysis -I	2

15 L

Unit I **Introduction to C Programming**

(a) Structure of C: Header and body, Use of comments, Compilation of a program.

(b) Data Concepts: Variables, Constants, data types like: int, float char, double and void. Qualifiers: short and long size qualifiers, signed and unsigned qualifiers. Declaring variables, Scope of the variables according to block, Hierarchy of data types.

(c) Types of operators: Arithmetic, Relational, Logical, Compound Assignment, Increment and decrement, Conditional or ternary, Bitwise and Comma operators. Precedence and order of evaluation. Statements and Expressions.

(d) Mathematical functions : sin(), cos(), tan, acos(), asin(), atan(), exp(), ceil(), floor(), log(), log10(), pow(), sqrt().

(e) Type conversions: Automatic and Explicit type conversion.

(f) Data Input and Output functions: Formatted I/O: printf(), scanf(). Character I/O format: getch(), getche(), getchar(), getc(), gets(), putchar(), putc(), puts().

(g) Arrays: (One and multidimensional), declaring array variables, initialization of arrays, accessing array elements.

(h) Strings: Declaring and initializing String variables, Character and string handling functions (strcpy, strcat, strchr, strcmp, strlen, strstr, atoi, atof).

(i) Iterations: Control statements for decision making: (a) Branching: if statement, else.. if statement, switch statement. (b) Looping: while loop, do.. while, for loop. (c) Jump statements: break, continue and goto.

Unit II **Functions, Pointers and Structures** 15 L

(a) Functions: Global and local variables, Function definition, return statement, calling a function (by value, reference).

(b) Recursion: Definition, Recursion functions algorithms for factorial, Fibonacci sequence, Tower of Hanoi. Implement using C.

(c) Storage classes: Automatic variables, External variables, Static variables,

Register variables.

(d) Pointer: Fundamentals, Pointer variables, Referencing and de-referencing, Pointer Arithmetic, Pointers and Arrays, Array of Pointers, Pointers as function arguments, Functions returning pointers, Pointer to function.

(e) Structure: Declaration of structure, reading and assignment of structure variables, Array of structures, arrays within structures, structures within structures, structures and functions.

Unit III **Relational Database Management System** 15 L

(a) Introduction to Database Concepts: Database, Overview of database management system, Advantages of a DBMS, Database Languages- Data Definition Language (DDL) and Data Manipulation Languages (DML).

(b) Entity Relation Model: Entity, attributes, keys, relations, Designing ER diagram, integrity constraints over relations.

(c) Creating and altering tables: Conversion of ER to relations with and without constraints; CREATE statement with constraints like KEY, CHECK, DEFAULT, ALTER and DROP statement.

(d) Handling data using SQL: selecting data using SELECT statement, FROM clause, WHERE clause, HAVING clause, ORDER BY, GROUP BY,DISTINCT and ALL predicates, Adding data with INSERT statement, changing data with UPDATE statement, removing data with DELETE statement.

(e) Functions: Aggregate functions-AVG, SUM, MIN, MAX and COUNT, Date functions-DATEADD(),DATEDIFF(),GETDATE(),DATENAME()YEAR(),MONTH(), WEEKDAY(), String functions- LOWER(), UPPER(), TRIM(), RTRIM(), PATINDEX(), REPLICATE(), REVERSE(),RIGHT(), LEFT()

(f) Joining tables: Inner, outer and cross joins, union.

Unit IV **Introduction to PL/SQL** 15 L

(a) Fundamentals of PL/SQL: Defining variables and constants, PL/SQL expressions and comparisons: Logical Operators, Boolean Expressions, CASE Expressions Handling, Null Values in Comparisons and Conditional Statements, PL/SQL Data types: Number Types, Character Types, Boolean Type. Datetime and Interval Types.

(b) Overview of PL/SQL Control Structures: Conditional Control: IF and CASE Statements, IF-THEN Statement, IF-THEN-ELSE Statement, IF-THEN-ELSIF Statement, CASE Statement, Iterative Control: LOOP and EXIT Statements, WHILE-LOOP, FOR-LOOP, Sequential Control: GOTO and NULL Statements.

References:

(a) Programming in ANSI C (Third Edition) : E Balagurusamy, TMH

(b) Let us C by Yashwant Kanetkar, BPB.

(c) Database Management Systems, Ramakrishnam, Gehrke, McGraw-Hill

(d) Ivan Bayross, "SQL,PL/SQL -The Programming language of Oracle", B.P.B. Publications, 3rd Revised Edition.

(e) Michael Abbey, Michael J. Corey, Ian Abramson, Oracle 8i – A Beginner's Guide, Tata McGraw-Hill.

Additional References:

(a) Mastering Algorithms with C, Kyle Loudon, Shroff Publishers.
(b) Algorithms in C (Third Edition): Robert Sedgewick , Pearson Education Asia.
(c) Programming in ANSI C by Ram Kumar, Rakesh Agrawal, TMH.
(d) Programming with C (Second Edition): Byron S Gottfried (Adapted by Jitender Kumar Chhabra) Schaum's Outlines (TMH)
(e) Programming with C : K R Venugopal, Sudeep R Prasad TMH Outline Series.
(f) Unix and C : M.P. Bhave and S.A. Pateker, Nandu printers and publishers private limited.
(g) Elsmasri and Navathe, "Fundamentals of Database Systems", Pearson Education.
(h) Peter Rob and Coronel, "Database Systems, Design, Implementation and Management", Thomson Learning
(i) C.J.Date, Longman, "Introduction to database Systems", Pearson Education.
(j) Jeffrey D. Ullman, Jennifer Widom, "A First Course in Database Systems", Pearson Education.
(k) Martin Gruber, "Understanding SQL",B.P.B. Publications.
(l) George Koch and Kevin Loney , ORACLE "The Complete Reference", Tata McGraw Hill,New Delhi.

Course code	Topics for Practical	Credits
SMAT 5 AC PR		2

1. Write a C program that illustrates the concepts of C operators, mathematical functions, arrays and string.
2. Write a C program that illustrates the concepts of different iterations.
3. Write a C program that illustrates the concepts of functions, recursion and storage classes.
4. Write a C program that illustrates the concepts of pointers and structure.
5. Creating a single table with/ without constraints and executing queries. Queries containing aggregate, string and date functions fired on a single table.
6. Updating tables, altering table structure and deleting table Creating and altering a single table and executing queries. Joining tables and processing queries.
7. Writing PL/SQL Blocks with basic programming constructs.
8. Writing PL/SQL Blocks with control structures.