BHAGWANT GLOBAL UNIVERSITY KOTDWAR

Evaluation Scheme & Syllabus For

Bachelor of Computer Application

Three year full time Under Choice Based Credit System (CBCS)

FIRST SEMESTER:

S. No	Course No.	Subject Name	L	T	P	Mid Term	Asses Test	Ext	Total	Credit
			Periods							
Theory										
1.	01CAD101	Introduction to C Language	4	0	0	15	15	70	100	4
2.	01 CAD 102	Basic Mathematics	4	1	0	15	15	70	100	4
3.	01 CAD 103	Elective Paper(EL1)	4	0	0	15	15	70	100	4
4.	01 CAD 104	Communicative English	4	1	0	15	15	70	100	4
5.	01 CAD 105	Minor Elective Paper(EL1*)								4
Practical										
1.	01 CAD 201	Lab: (C and Unix)	0	0	3	10	20	70	100	2
2.	01 CAD 301	General Proficiency	0	0	0	10	20	70	100	1
		Total							600	23

Elective Paper (EL1)

SN	Semester	Course Code	Course
1	I		Information System for Business
2	I		Druple - Content Management System (SWAYAM) https://onlinecourses.swayam2.ac.in/aic20_sp07/preview
3	I		E-Commerce Technologies (SWAYAM) https://onlinecourses.swayam2.ac.in/cec22_mg05/preview

Minor Elective Paper (EL1*)

SN	Semester	Course Code	Course
1	I		Information System for Busines
2	I/II		Open-Source Software (ePG Pathshala) https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=i
3	I/II		Introduction to Cyber Security (SWAYAM) https://onlinecourses.swayam2.ac.in/nou19_cs08/previ ew
4	I/II		Skill Development of the youths and their Livelihood (SWYAM) https://onlinecourses.swayam2.ac.in/nou22_ge30/preview

SECOND SEMESTER:

Sr. No.	Course Code	Subject Name	L	T	P	Mid Term	Asses Test	Ext	Total	Credit
Theory										
1.	02 CAD 101	Introduction to C++	4	1	0	15	15	70	100	4
2.	02 CAD 102	Data Structures	4	0	0	15	15	70	100	4
3.	02 CAD 103	Elective Paper(EL2)	4	0	0	15	15	70	100	4
4.	02 CAD 104	Digital Electronics	4	0	0	15	15	70	100	4
5.	02 CAD 105	Minor Elective Paper(EL1*)								4
Practical										
1.	O2 CAD 201	Lab: (C++)	0	0	3	10	20	70	100	2
2.	02 CAD 301	General Proficiency	0	0	0	10	20	70	100	1
		Total							600	23

Elective Paper (EL2)

SN	Semester	Course Code	Course
1	II		Discrete Mathematic
2	II		Moodle Learning Management System (SWAYAM) https://onlinecourses.swayam2.ac.in/aic20_sp27/preview
3	II		Open-Source Software (ePG Pathshala) https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=iLkS uZZ 5a+koxhsE1m+YjQ==

THIRD SEMESTER:

S. No	Course No.	Subject	L	T	P	Mid Term	Asses Test		Ext	Total	Credit
			Period								
Theory											
1.	03 CAD 101	Programming in Python	4	1	0	15	15		70	100	4
2.	03 CAD 102	Organizational Behavior	4	0	0	15	15		70	100	4
3.	03 CAD 103	Elective Paper(EL3)	4	1	0	15	15		70	100	4
4.	03 CAD 104	Computer System Architecture		0	0	15	15		70	100	4
5.	03 CAD 105	Minor Elective Paper(EL2*)									4
Practical											
1.	03 CAD 201	Lab: (Python)	0	0	3	10	20		70	100	2
2.	03 CAD 301	General Proficiency	0	0	0	10	20		70	100	1
		Total								600	23

Elective Paper (EL3)

SN	Semester	Course Code	Course
1	III		Operational Research
2	III		R Programming (SWAYAM) https://onlinecourses.swayam2.ac.in/aic20_sp35/preview
3	III		Cryptography and Network (ePG Pathshala) https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=fBYc kQ KJvP3a/8Vd3L08tQ=

Minor Elective Paper (EL2*)

SN	Semester	Course Code	Course
1	III		Programming in Python
2	III/IV		E-Commerce Technologies (SWYAM) https://onlinecourses.swayam2.ac.in/cec22_mg05/preview
3	III/IV		Cyber Security Tools Techniques and Counter Measures (SWYAM) https://onlinecourses.swayam2.ac.in/nou22_ge24/preview
4	III/IV		Druple - Content Management System(SWAYAM) https://onlinecourses.swayam2.ac.in/aic20_sp07/preview

FOURTH SEMESTER:

S. No	Course No.	Subject	Evaluation–Scheme								Credit
			Period								
			L	T	**P**	Mid Term	**Asses Test**		Ext	Total	
Theory											
1.	04 CAD 101	Introduction to Database Management System	4	1	0	15	15		70	100	4
2.	04 CAD 102	Operating System	4	0	0	15	15		70	100	4
3.	04 CAD 103	Elective Paper(EL4)	4	0	0	15	15		70	100	4
4.	04 CAD 104	Numerical Analysis and Statistical Technique	5	1	0	15	15		70	100	4
5.	04 CAD 105	Minor Elective Paper(EL2*)									4
Practical											
1.	04 CAD 201	Lab: (DBMS)	-	-	3	10	20		70	100	2
3	04 CAD 301	General Proficiency				10	20		70	100	1
		Total								600	23

Minor Elective Paper (EL4)

SN	Semester	Course Code	Course
1	IV		Introduction to Cyber Security
2	IV		Data Mining (SWAYAM) https://onlinecourses.swayam2.ac.in/cec22_cs06/preview
3	IV		Data Analytics (ePG Pathshala) https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=fBYc kQ KJvP3a/8Vd3L08tQ==

FIFTH SEMESTER:

S. No	Course No.	Subject	Period			Mid Term	Asses Test		Ext	Total	Credit
			L	T	P						
Theory											
1.	05 CAD 101	Digital Communication and Network	4	0	0	15	15		70	100	4
2.	05 CAD 102	JAVA	4	0	0	15	15		70	100	4
3.	05 CAD 103	Elective Paper(EL5)		0	0	15	15		70	100	4
4.	05 CAD 104	Computer Graphics	5	1	0	15	15		70	100	4
Practical											
1.	05 CAD 201	Lab: (JAVA)	0	0	3	10	20		70	100	2
2.	05 CAD 301	General Proficiency				10	20		70	100	1
		Total								600	19

Elective Paper (EL5)

SN	Semester	Course Code	Course
1	V		Cloud Computing
2	V		Cyber Security Tools Techniques and Counter Measures (SWAYAM) https://onlinecourses.swayam2.ac.in/nou22_ge24/preview
3	V		Android Mobile Application Development (SWAYAM) https://onlinecourses.swayam2.ac.in/nou22_ge25/preview

SIXTH SEMESTER:

S. No	Course No.	Subject	Evaluation–Scheme								Credit
			Period								
			L	T	P	Mid Term	Asses Test		Ext	Total	
Theory											
1.	06 CAD 101	Artificial Intelligence	4	1	-	15	15		70	100	4
2.	06 CAD 102	Web Technologies	4	1	-	15	15		70	100	4
3.	06 CAD 103	Elective Paper(EL6)	4	-	-	15	15		70	100	4
4.	06 CAD 103	C# and .NET Framework	4	-	-	15	15		70	100	4
Practical											
1.	06 CAD 201	Lab: (C# and Web Technology)	-	-	3	10	20		70	100	2
3	06 CAD 301	General Proficiency				10	20		70	100	1
		Total								600	19

Elective Paper (EL6)

SN	Semester	Course Code	Course
1	VI		Software Engineering
2	VI		Digital Forensics (SWAYAM) https://onlinecourses.swayam2.ac.in/nou22_cs05/preview
3	VI		Basics of Remote sensing, GIS & GNSS technology and their applications (SWAYAM) https://onlinecourses.swayam2.ac.in/aic22_ge16/preview

Subject Name- Introduction to C Language	**Subject Code- 01CAD101**
Semester-First	**CreditValue-4[P=0, T=0,L=4]**

Unit-I

Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Character set in C, Keywords in C, Hierarchy of operators, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Output function, Input function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators

Unit-II

if statement, if else statement, for statement, while loop, do while statements, break statements, continue statements, switch statement, go to statement, ternary operators.

Unit-III

Advantages of arrays, types of arrays, array declaration, array initialization, accessing data from array, array inside the memory, multidimensional arrays. Character arrays, Array overflow, String Variables, Reading & writing strings, string handling functions

Unit-IV

Advantages of functions, declaring a function, calling a function, variables, passing arguments to a function, nested functions, passing array to functions, recursion in functions, Call by value and Call by reference. Pointers and function, Array of pointers, Pointer and Strings, Pointer to structure, Pointers within structure, Introduction of Static and Dynamic memory allocation, Dynamic memory allocation, DMA functions, malloc () function, Size of () operator, Function free (), Function realloc().

Unit-V

Introduction to File Handling: File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, reading from file, writing to file, Closing a file.

References:

- Brian W. Kernighan and Dennis Ritchie, "The C Programming Language" Pearson Publication
- Let us C-Yashwant Kanetkar
- K.R.Venugopal, S.R.Prasad, "Mastering C" McGraw-Hill Education India

Subject Name- Basic Mathematics   **Subject Code- 01CAD102**
Semester-First   **CreditValue-4[P=2, T=0,L=4]**

Unit-I
Limits and Continuity: Definition of Limit, Algebra of limits, Right & left-hand limits, Infinite limits, Continuity (Definitions & examples, Algebra of Continuous functions), Differentiability, Rolle's and Mean value theorem with numerical problems.

Unit-II
Integral Calculus: Integral as an inverse of Differentiation. Integration by parts. Methods of substitution & use of partial fractions, standard forms and simple examples, Definite integral & their applications to areas and length & Curves.

Unit-III
Differential Equation: First order and first-degree differential equations, separation of variables, Homogeneous, linear, exact differential equations, second order linear equations with constant coefficients, Orthogonal trajectories

Unit-IV
Co-ordinate Geometry: System of lines, System of Circles, Standard equations & properties of parabola & ellipse.

Unit-V
Matrices: Definition, Types of matrices, Laws of operations on matrices, Transpose, adjoint and inverse of matrices, solution of linear system of equations, and Cramer's rule, Rank of Matrices, square Matrices, Eigen values, Eigen Vectors, Characteristic polynomials, Cayley Hamilton theorem.

References:

● Bansi lal & S. Arora" Two-Dimensional Co-ordinate Geometry" S. chand

● S.C.Gupta 'Matrices", S. Chand

● R.S. Agarwal Differential Calculus S. Chand

● Harikrishna Real Analysis S.Chand forthcoming) ed.Dr.GauriMishra, DrRanjanaKaul, DrBratiBiswas

Subject Name-Information System for Business	**Subject Code- 01CAD103**
Semester-First	**CreditValue-4[P=2, T=0,L=4]**

Unit-I

What is an Information System, Components of Information System, Role of Information System, System hardware, Moore's Law, Role of Software in an organization, Types of Software.

Unit-II

Data and Databases, Types of Database, Big Data, Data Warehouse, Networking and Communication, History of Internet, Organizational Networking, Information System Security Triad, Tools of Information Security, Personnel Information Security

Unit-III

Why IT matters, Collaborative Systems, Decision Support Systems, Business process, role of Information System in Business process, ERP Systems, People in Information System, emerging roles.

Unit-IV

Information System Development, System Development Lifecycle, Types of Programming Languages, What is Globalization, Impact of Internet on Globalization, what is digital divide, Steps to alleviate Digital Divide

Unit-V

Ethics in Information System, Intellectual Property and Copyright, Patent, Responsibilities of individual, organization and government in Information Age, Future Trends in Information System

References:
● Information Systems for Business and Beyond by David T. Bourgeois, PhD, The Saylor Academy.
● Business Information Systems, 5th edn by Paul Bocji, Pearson.
● Principle of Information System, Ralph Stair.

Subject Name-Communicative English	**Subject Code-01CAD104**
Semester-First	**Credit Value-4 [P=0, T=1,L=4]**

Unit-I

What is Communication, Levels of Communication, Importance, Scope and Process of communication, Essentials of good communication, 7 Cs of communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers to communication.

Unit-II

Objectives of written Communication, Media of written communication, Merits and demerits of written communication. Words and Phrases, Guidelines for Effectiveness, Sentence Construction, Paragraph Development, Essay writing, Precise Writing**.**

Unit-III

Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.

Unit-IV

Effective listening, Active vs. Passive Listening, Effective Presentation Strategies, Effective Use of Visual Aids, Interviews, Types of Interviews, Group Discussion, Meetings, Conferences.

Unit-V

Business letters, Preparation of resume, Office memorandum, Letter writing, Memorandums, E-mails, Report Writing, Technical Proposals.

References:

● Technical Communication – Principles and Practice byMeenakshi Raman & Sangeeta Sharma, Oxford University Press, Sixteenth Impression 2007.
● High School English Grammar and Composition by Wren & Martin
● Business Communication by Meenakshi Raman & Prakash Singh, Oxford University Press, Seventh Impression 2008.
● Technical Writing by B.N.Basu, Prentice-Hall India Pvt. Ltd., 200

Subject Name- Lab: (C and UNIX)　　　　　**Subject Code-01CAD105**

Semester-First　　　　　**Credit Value-2 [P=0, T=1,L=2]**

Lab Experiment List

- To learn elementary techniques involving arithmetic operators and mathematical
- Expressions, appropriate use of selection (if, switch, conditional operators) and
- Control structures
- Learn how to use functions and parameter passing in functions, writing recursive
- Programs.
- Write Programs to learn the use of strings and string handling operations.
- Problems which can effectively demonstrate use of Arrays. Structures and Union.
- Write programs using pointers.
- Write programs to use files for data input and output.
- To learn directory navigation in Unix-like systems.
- To practice UNIX commands
- Practice pattern matching with awk, grep.
- Practice file editing with vi/nano.

Subject Name- Introduction to C++   **Subject Code-02CAD101**
Semester- Second   **Credit Value-4 [P=0, T=1,L=4]**

Unit-I

Procedural vs. Object oriented programming, The main function, C++ preprocessors and the file, C++ input and output with cin and cout. Simple variables, naming simple variables, Integer types, Floating types, Operators, Operator precedence and associativity, Type conversion, symbolic constants, Derived data types, Arrays, strings, structure, reference variables, new and delete operators. Relational expression in C++, relational operators, for loop, while loop, do-while loop, if-else statement, logical operators, conditional operators, switch statements, break and continue statements.

Unit-II

Defining a function, function prototyping and function calls, function arguments, passing by reference, inline functions, and default arguments.

Unit-III

Defining classes, implementing member functions, class constructor and destructor, this pointer, friend function, examples based on class and object problems. Base classes, derived classes, implementing and using derived classes, virtual base class, types of inheritance. Problem based on multiple inheritance

Unit-IV

Stream classes, output with stream class methods, input with cin, introduction with file handling. Memory Leak, Memory Leak Prevention, Smart pointers, unique_ptr.

Unit-V

Standard Template Library: STL containers containing vectors, list, queue, map, set, hash map, hash set. STL algorithms functions: Sorting Algorithms functions: sort, partial sort. Searching Algorithms functions: binary_search, lower_bound, upper bound, equal range. Non-Modifying Algorithms: count, equal, mismatch, search, search. Modifying Algorithms functions: copy, copy_n, fill, fill_n, move, transform, generate etc

References:

- 'C++ Primer' by Stanley B. Lippmann, Josée Lajoie, and Barbara E. Moo
- The 'Effective Modern C++' by Scott Meyers
- Bjarne Stroustrup: The C++ programming language.

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Subject Name-Data Structure   Subject   Code-02CAD102
Semester-Second   CreditValue-4[P=0,T=0,L=4]

Unit-I
Introduction to Data Structures: Basic Terminology, Data type, Data object, Need of Data Structure, Types of Data Structure, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time Space trade-off.

Unit-II
Arrays & Linked Lists: Arrays, Single and Multidimensional Arrays, address calculation, application of arrays, Linked list: Representation and implementation of Singly Linked Lists, Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to and from Linked Lists, Doubly linked list.

Unit-III
Stacks & Queues: Stacks: Array and linked representation and implementation of stack, Operations on Stacks: Push & Pop, Applications of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Introduction, recursion in C, example of recursion, recursive functions. Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Insert, Delete, Full and Empty. Circular queue, Deques, and Priority Queues.

Unit-IV
Trees & Graphs: Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic expressions, Complete Binary Tree., Traversing Binary trees, Binary Search Tree, searching BST, insertion and deletion in BST. Graph: Basic terminology, Traversal: BFS, DFS. Spanning Tree: Prims, Kruskal Algorithm, and Dijkstra's Algorithm.

Unit-V
Searching & Sorting: Searching- Sequential search, binary search. Sorting algorithms with efficiency- Bubble sort, selection sort, Insertion sort, Merge sort, Quick Sort.

References:

● Data Structures- Seymour Lipschutz
● Data Structures using C and C++- Tanenbau

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Subject Name- Discrete Mathematics   **Subject Code-02CAD103**
Semester-Second   **CreditValue-4[P=0,T=0,L=4]**

Unit-I
Propositional Logic: Propositions, Logical connectives, Compound propositions, Conditional and biconditional propositions, Truth tables, Tautologies and contradictions, Contra positive, Logical equivalences and implications, DeMorgan's Laws, Normal forms, Principal conjunctive and disjunctive normal forms, Rules of inference, Arguments, Validity of arguments.

Unit-II
Set Theory: Basic concepts, Notations, Subset, Algebra of sets, The power set, Ordered pairs and Cartesian product, Relations on sets, Types of relations and their properties, Relational matrix and the graph of a relation, Partitions, Equivalence relations, Partial ordering, Poset, Hasse diagram, Lattices and their properties, Sub lattices, Boolean algebra, Homomorphism.

Unit-III
Functions: Definitions of functions, Classification of functions, Type of functions, Examples, Composition of functions, Inverse functions, Binary and nary operations, Characteristic function of a set.

Unit-IV
Groups: Algebraic systems, Definitions, Examples, Properties, Semi groups, Monoids, Homomorphism, Sub semi groups and Submonoids, Cossets and Lagrange's theorem, Normal subgroups, Normal algebraic system with two binary operations.

Unit-V
Formal Languages, operations on languages, Kleen closure, Regular Set, Regular expression, regular   language, Phrase structure grammars, Types of grammars, types of languages. Conversion of regular expression to Finite Automata, NFA, DFA. Moore Machine, Mealy Machine.

References:

● Richard Johnsonbaugh, "Discrete Mathematics", Pearson Pub.

● Kenneth H. Rosen, "Discrete Mathematics and Its Applications", Tata McGraw-Hill Pub.

● Harry Lewis, Rachel Zax, "Essential Discrete Mathematics for Computer Science" Princeton

Subject Name- Digital Electronics	**Subject Code-02 CAD 104**
Semester-Second	**CreditValue-4[P=0,T=1,L=4]**

Unit-I

Fundamental concepts: Digital Computer and Digital Systems, Binary Numbers, Number Base Conversion, Complements, Binary Codes.

Unit-II

Boolean algebra and logic gates: Basic Theorem and Properties of Boolean Algebra, Boolean functions, Canonical and standard forms. Digital logic gates, Simplification of Boolean functions: two and three variable Maps, four variable maps. POS simplification, NAND and NOR Implementation, don't care conditions.

Unit-III

Combinational Logic Design: Design procedure, Adders, Subtractors, Code conversion, Binary Parallel adder, Decimal adder, Magnitude Comparator, Decoder, Encoder, Multiplexers, DeMultiplexers, Parity generation and checking.

Unit-IV

Sequential Logic Design: Flip-flops: Basic flip-flop, RS, JK, D, T, Triggering of flip-flops, Analysis of clocked sequential circuits, state reduction and assignment, flip-flop excitation tables.

Unit-V

Registers, Counters and the Memory unit: Registers, shift registers, Counters, Asynchronous and synchronous counters, Ripple counters. Memory-RAM, ROM, Programmable logic array (PLA).

References:

- "Modern Digital Electronics" - R.P. Jain

- Digital logic and Computer design- M. Morris Mano

Subject Name- : Lab: (C++)   **Subject Code-02CAD105**

Semester-Second   **CreditValue-2[P=0,T=1,L=2]**

Lab Experiment List

- To learn elementary techniques involving arithmetic operators and mathematical
- Expressions, appropriate use of selection (if, switch, conditional operators) and
- Control structures
- Learn how to use functions and parameter passing in functions, writing recursive programs.
- Write Programs to learn the use of strings and string handling operations.
- Problems which can effectively demonstrate use of Arrays. Structures and Union.
- Write programs using pointers.
- Write programs to use files for data input and output.
- Learn how to implement OOPs in C++.
- Develop OOPs solutions to problems.
- Write programs using polymorphism, inheritance.
- Demonstration of virtual function.
- Demonstration of static function.
- Accessing a particular record in a student's file.
- Demonstration of operator overloading.
- Learn practices of Modern C++.
- Problems which can effectively demonstrate use of smart pointers.
- Use C++ containers and rest of the STL library.
- Implement various Data Structures using C++.
- Implement searching and sorting using C++.

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Subject Name- Programming in Python **Subject Code- - 03CAD101**
Semester-Third **Credit Value-4[P=0, T=0,L=4]**

Unit-I

Introduction and Overview: Overview of Python Programming: Structure of a Python Program, Elements of Python, Python Interpreter, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings.

Unit-II

Operators and Statements: 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.

Unit-III

Decision making and Branching: Control statements (Branching, Looping, Conditional Statement, Difference between break, continue and pass, default arguments. Defining Functions.

Unit-IV

Classes and Objects: An introduction to object-oriented programming in Python. Objects, operator overloading, overriding, special methods. Inheritance, polymorphism and composition.

Unit-V

Iterators and Generators: Iteration protocol, Iterable objects, generators and generator expressions. Use of generators, assertions. Testing and debugging of a python project, Web Scrapping in Python.

References:
- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- Python Tutorial/Documentation www.python.or 2015
- Allen Downey, Jeffrey Elkner, Chris Meyers, how to think like a computer scientist: learning with Python, Freely available online.2012

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Subject Name- Organizational Behavior   **Subject Code-03CAD102**
Semester-Third   **CreditValue-4[P=0,T=1,L=4]**

Unit-I

Nature, Scope, Definition and Goals of Organizational Behavior, Fundamental Concepts of Organizational Behavior, Models of Organizational Behavior, Emerging aspects of Organizational Behavior: TQM, Managing Cultural Diversity, Managing the Perception Process.

Unit-II

Effects of employee attitudes Personal and Organizational Values Job Satisfaction Nature and Importance of Motivation Achievement Motive Theories of Work Motivation: Maslow's Need Hierarchy Theory, McGregor's Theory 'X' and Theory 'Y'

Unit-III

Definition of Personality, Determinants of Personality Theories of Personality – Trait and Type Theories, The Big Five Traits, Myers-Briggs Indicator, Locus of Control, Type A and Type B Assessment of Personality

Unit-IV

Meaning and definition of Stress, Symptoms of Stress Sources of Stress: Individual Level, Group Level, Organizational Level Stressors, Extra Organizational Stressors Effect of Stress– Burnouts Stress Management – Individual Strategies, Organizational Strategies Employee Counseling.

Unit-V

Nature of Group, Types of Groups Nature and Characteristics of team building, Effective Teamwork Nature of Leadership, Leadership Styles Traits of Effective Leaders

References:

● Organizational Behavior Text, Cases and Games- By K. Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)
● Organizational Behavior Human Behavior at Work by J. W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12 th Edition (2007)

Subject Name- Operational Research	**Subject Code-03CAD103**
Semester-Third	**CreditValue-4[P=0,T=0,L=4]**

Unit-I

Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem: Formulation of LPP, Graphical solution of LPP. Simplex Method, Artificial variables, big-M method, two-phase method, degeneracy and unbound solutions.

Unit-II

Transportation Problem: Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the steppingstone method and MODI method. Assignment Problem: Formulation, Hungarian method for optimal solution. Solving unbalanced problem. Traveling salesman problem as assignment problem.

Unit-III

Sequencing models: Solution of Sequencing Problem, Processing n Jobs through 2 Machines, Processing n Jobs through 3 Machines, Processing 2 Jobs through m machines, Processing n Jobs through m Machines.

Unit-IV

Dynamic programming: Characteristics of dynamic programming, Dynamic programming approach for Priority Management, Employment Smoothening, Capital Budgeting, Stagecoach/Shortest Path, Cargo Loading and Reliability problems.

Unit-V

Simulation: Advantages of Simulation, Limitations of Simulation, Monte-Carlo Simulation, Random Numbers. CPM and PERT: Drawing of networks, Removal of redundancy, Network computations, Free slack, Total slack, Crashing, Resource allocation.

References:

● Rader, D. J. 2010, Deterministic Operations Research: Models and Methods in Linear Optimization, J. Wiley & Sons
● Taha, H. A. 2007, Operations Research, 8th edn, Pearson
● P. Sankara Iyer," Operations Research", Tata McGraw-Hill, 2008.
● J K Sharma., "Operations Research Theory & Applications, 3e", Macmillan India Ltd, 2007

Subject Name-Computer System Architecture   **Subject Code-03CAD104**

Semester- Third   **CreditValue-4[P=0,T=1,L=4]**

Unit-I

Basic Computer Organization and Design: Register Transfer Language, Arithmetic and Logical, micro-operations, Shift micro-operation. Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference instructions, input-output and interrupt. Design of basic computer, Booth algorithm.

Unit-II

Central Processing Unit: Micro programmed control, Control memory, address sequencing, General Register organization, stack organization, Instruction formats, addressing modes, Data transfer and manipulation, Program Control, RISC, and CISC.

Unit-III

Input Output Organization: Peripheral devices, I/O interface, Asynchronous data transfer, Strobe Control, Handshaking Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor, and Serial Communication.

Unit-IV

Memory Organization: Memory Hierarchy, Main memory (RAM/ROM chips), Auxiliary memory, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware.

Unit-V

Pipelining: Parallel processing, Amdahl's law, Pipelining, Flynn's classification, space-time diagram, speedup ratio, Arithmetic pipeline, Instruction pipeline.

References:

● M. Mano, Computer System Architecture, Pearson Education 1992

● W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition,

Prentice Hall of India, 2009

● M.M. Mano, Digital Design, Pearson Education Asia, 2013

● Carl Hamacher, Computer Organization, Fifth edition, McGraw-Hill, 2012.

Subject Name- Lab: (Python)   **Subject Code-03CAD105**
Semester- Third   **Credit Value- 2[P=0,T=0,L=4]**

Lab Experiment List

- Write a program to demonstrate different number data types in Python.
- Write a program to perform different Arithmetic Operations on numbers in Python.
- Write a programs to perform different String Operations.
- Write programs to showcase the python time library.
- Write a program to demonstrate working with lists in python.
- Write a program to demonstrate working with tuples in python.
- Write a program to demonstrate working with dictionaries in python.
- Write programs to demonstrate the uses of functions.
- Demonstrate the use of *args, **kwargs in python.
- Write Programs to showcase use of lambda functions.
- Write a python program to define a module and import a specific function in that module to another program.
- Write Programs for file operations in python.
- Write programs to demonstrate the working of generator.
- Implement programs to showcase the uses of Iterators.
- Demonstrate OOPs Capabilities of python language.
- Demonstrate Exception Handling features of Python.
- Write testing cases for python programs.
- Learn basics of web scrapping in python.
- Create a working web scrapper in python.

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Subject Name-Introduction to DBMS	**SubjectCode-04CAD101**
Semester-Fourth	**CreditValue-4[P=0,T=0,L=4]**

Unit-I
Elements of database system, DBMS and it's architecture, advantages of DBMS, data independence, types of database users, role of database administrator.

Unit-II
Brief overview of hierarchical and network model, relation model (Relations, properties of relational model, keys and entity integrity & referential integrity rules), CODD's rules for referential Model. Entity relationship Model: Entity sets, Relationship sets, Design Issue, Mapping constraints, E-R diagram, weak entity sets, specialization & generalization.

Unit-III
Normalization concepts and update anomalies, Functional dependencies, Normal forms (1NF, 2NF, 3NF, BCNF)

Unit-IV
SQL fundamentals - Integrity – Triggers - Security – Advanced SQL features – Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases.

Unit-V
Centralized system, Client-Server systems (Transaction server, Data server), Parallel system (Speedup & Scale up), Parallel database architecture (Shared memory, Shared Disk, Shared Nothing), Distributed System (Structures, Tradeoffs), Backup and Recovery, Security and Privacy.

References:

● Date C J, "An Introduction to Database System", Addison Wesley
● Navathe E, "Database management systems",
● Silberschatz & Korth, Database system Concepts, TMH
● Bipin Desai, an Introduction to Database System, Galgotia Pub

Subject Name-Operating System &System Administration   **SubjectCode-04CAD102**
Semester-Fourth   **CreditValue-4[P=0, T=0, L=4]**

Unit-I

Introduction: Basics of Operating Systems: Definition – Generations of Operating systems – Types of Operating Systems, OS Service, and System Calls. Process Management: Processes: Definition, Process Relationship, Process states, Process State transitions, Process Control Block, Context switching – Threads – Concept of multithreads. Process Scheduling: Definition, Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only), Scheduling algorithms: Pre-emptive and Non, pre-emptive, FCFS – SJF – RR

Unit-II

Inter-process Communication: Race Conditions, Critical Section, Mutual Exclusion, Peterson's Solution, The Producer Consumer Problem, Semaphores, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem etc. Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance: banker's algorithm, Deadlock detection and Recovery.

Unit-III

Memory Management: Basic Memory Management: Definition, Logical and Physical address map, Memory allocation: Contiguous Memory allocation, Fixed and variable partition, Internal and External fragmentation and Compaction, Paging: Principle of operation, Page allocation, Hardware support for paging, Protection and sharing, Disadvantages of paging. Virtual Memory: Basics of Virtual Memory, Hardware and control structures, Locality of reference, Page fault, Working Set, Dirty page/Dirty bit, Demand paging (Concepts only), Page Replacement policies: Optimal (OPT), First in First Out (FIFO, Least Recently used (LRU).

Unit-IV

I/O Management & Disk Scheduling: I/O Devices and the Organization of I/O Disk I/O, Disk Scheduling Algorithm, Operating System Design Issues. File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues.

Unit-V

Shell introduction and Shell Scripting: What is shell and various type of shell, various editors present in Linux, Different modes of operation in vi editor. What is shell script, Writing and executing the shell script, Shell variable (user defined and system variables) System calls, Using system calls, Pipes and Filters, Decision making in Shell Scripts (If else, switch), Loops in shell, Functions, Utility programs (cut, paste, join, tr , uniq utilities), Pattern matching utility (grep)

References:
● Andrew S. Tanenbaum and Herbert Bos," Modern Operating Systems," Fourth Edition, Pearson, 2014.
● Abraham Silberschatz, Greg Gagne, and Peter B. Galvin, "Operating System Concepts," Tenth Edition, Wiley, 2018.
● William Stallings, "Operating Systems: Internals and Design Principles," Seventh Edition, Prentice Hall, 2011.
● Milan Milankovic "Operating systems, Concepts and Design" McGraw Hill

Subject Name- Introduction to Cyber Security **SubjectCode-04CAD103**
Semester-Fourth **CreditValue-4[P=0,T=1,L=4]**

Unit-I
Introduction to Cyber Security - Importance and challenges in Cyber Security, Cyberspace, and Cyber threats, Cyber warfare, CIATriad, Cyber Terrorism, Cyber Security of Critical Infrastructure.

Unit-II
Hackers and Cyber Crimes Types of Hackers - Hackers and Crackers, Cyber-Attacks and Vulnerabilities, Malware threats, Sniffing, Gaining Access - Escalating Privileges, Executing Applications, Hiding Files, Covering Tracks. Worms, Trojans, Viruses, Backdoors.

Unit-III
Ethical Hacking and Social Engineering Ethical Hacking Concepts and Scopes, Threats and Attack Vectors, Information Assurance, Threat Modeling, Enterprise Information Security Architecture, Vulnerability Assessment and Penetration Testing - Types of Social Engineering - Insider Attack - Preventing Insider Threats - Social Engineering Targets and Defence Strategies.

Unit-IV
Cryptography Cryptography in Practice, Historical Perspectives - Algorithms - Hashing Functions - Symmetric Encryption, Asymmetric Encryption, Quantum Cryptography, and Cryptography Algorithm Uses.

Unit-V
Intrusion Detection Systems History of Intrusion Detection Systems, IDS Overview, Network-Based IDSs, Host-Based IDSs, Intrusion Prevention Systems, Honey pots and Honey nets - Tools.

References:

● Nina Godbole, Sumit Belapure, "Cyber Security", Willey, 2011

● Roger Grimes, "Hacking the Hacker", Wiley, ist Edition, 2017

● Cybersecurity - Attack and Defense Strategies: Infrastructure security with Red Team and Blue Team tactics by Yuri Diogenes

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Subject Name-Numerical Analysis &Statistical Technique   SubjectCode-04CAD104
Semester-Fourth   CreditValue-4[P=0, T=0, L=4]

Unit-I
Introduction: Raw material of statistics, ungrouped & grouped frequency distribution.
Diagrammatic presentation: Bar diagram, Pie-diagram. Graphical presentation: Histogram,
Frequency polygon, Frequency curve, Cumulative frequency curve

Unit-II
Measures of Central Tendency and Dispersion: Arithmetic Mean, Mode, Median, Geometric
Mean, Harmonic Mean, Range, Mean Deviation, Standard Deviation, Skewness and Kurtosis.

Unit-III
Correlation and Regression Analysis: Scatter diagram, Karl Pearson, Spearman and Concurrent
deviation methods, Regression Lines, Method of least square.

Unit-IV
Probability & Probability Distribution: Classical, Empirical and axiomatic approach to
probability, Addition and multiplicative law of probability, Binomial, Poisson & Normal
Distribution

Unit-V
Numerical Methods: Interpolation: Finite difference, Operators Δ, E, Newton Gregory
Interpolation for equal intervals, divided difference, Newton's Lagrange's Interpolation for
unequal intervals. Central differences: Gauss Forward, Backward Formula, Stirling & Bessel's
formula. Numerical Differentiation & integration: Numerical differentiation by Newton Gregory
formula, general quadrature formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.
Euler-Maclaurin's summation formula.

References:

● Fundamental of mathematical statistics Gupta & Kapoor S.Chand
● Introduction to Numerical Methods S.S.Shastri PHI
● Rajaraman V., "Computer Oriented Numerical Methods", PHI-2004
● Gerald & Wheatley, "Applied Numerical Analyses", AW-2003

Subject Name- Lab: (DBMS)	SubjectCode-04CAD105
Semester-Fourth	**CreditValue-2[P=0, T=0, L=2]**

Lab Experiment List

● Analyze the organization and identify the entities, attributes and relationships in it.
● Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial
● keys, if any.
● Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities
● And weak entities (if any).
● Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular
● Fashion.
● Apply the First, Second and Third Normalization levels on the database designed for the
● Organization
● Installation of Mysql and practicing DDL commands
● Installation of MySql. Creating databases, how to create tables, altering the database, dropping
● Tables and databases if not required. Try truncate, rename commands etc.
● Practicing DML commands on the Database created for the example
● Organization
● DML commands are used to for managing data within schema objects. Some examples:
SELECT, INSERT, UPDATE, DELETE
● Practice queries (along with sub queries) involving ANY, ALL, IN, Exists, NOT EXISTS,
UNION, INTERSECT, Constraints etc.
● Practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN),
GROUP BY, HAVING and Creation and dropping of Views.

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Subject Name-Digital Communications& Networks   **Subject Code-05CAD101**
Semester-Fifth   **CreditValue-4[P=0, T=1,L=4]**

Unit-I
Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite**.**

Unit-II
Data Communication Fundamentals and Techniques: Analog and digital signal; data-rate limits; digital to digital line encoding schemes; pulse code modulation; digital to analog modulation-multiplexing techniques- FDM, TDM; transmission media

Unit-III
Error detection techniques; data-link control- framing and flow control; error recovery protocols-stop and wait ARQ, go-back-n ARQ; Multiple Access Protocol

Unit-IV
Networks Switching Techniques and Access mechanisms: Circuit switching; packet switching-connectionless datagram switching, connection-oriented virtual circuit switching;

Unit-V
Networks Layer Functions and Protocols: Routing algorithms; Distance vector routing and link state routing, protocol of Internet- IP protocol (IP4)

References:

● B. A. Forouzan: Data Communications and Networking, Fourth edition, THM ,2007
● S. Tanenbaum: Computer Networks, Fourth edition, PHI, 2002
● James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
● Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.

Subject Name-Programming in JAVA   **Subject Code- 05CAD102**
Semester-Fifth   **CreditValue-4[P=0, T=0, L=2]**

Unit-I
Features of java, JDK Environment & tools like (java, javac, applet viewer, javadoc, jdb), OOPs Concepts Class, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA, Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while), Type Casting, Array Creating an array Types of Array - One Dimensional arrays - Two Dimensional array, String - Arrays , Methods. – String Buffer class.

Unit-II
Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance Simple, Multilevel, Interfaces, Abstract classes and methods, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes, Modifiers and Access Control, Packages Packages Concept Creating user defined packages, Java Built in packages: java.lang->math, java.util->Random, Date, Hash table, Wrapper classes.

Unit-III
Exception, Exception types, Terms related to Exceptions, User Defined Expressions, Stream Classes, File Handling, File IO basics, File operations Multithreading, Thread vs Runnable, Thread Life Cycle, Collection Framework, Interfaces - Collection - List - Set - Sorted Set - Enumeration - Iterator – ListIterator, Classes - Linked List - Array List - Vector - Hash Set

Unit-IV
Database Programming, the Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Metadata, Row Sets, Transactions.

Unit-V
AWT: Components and container used in AWT, Layout managers, Listeners and Adapter classes, Event Delegation model, Swing: Introduction to Swing Component and Container Classes

References:
● Margaret Levine Young, "The Complete Reference Internet", TMH
● Balagurusamy E, "Programming in JAVA", TMH
● Naughton, Schildt, "The Complete Reference JAVA2", TMH
● Steven Holzner, "Java2 Black book", dreamtech

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Subject Name- Cloud Computing	**Subject Code- 05CAD103**
Semester-Fifth	**CreditValue-4[P=0, T=1, L=4]**

Unit-I

Introduction: Cloud-definition, benefits, usage scenarios, History of Cloud
Computing, Cloud Architecture, Types of Clouds, Players in Cloud Computing,
issues in Clouds.

Unit-II

Cloud Services: Types of Cloud services, Software as a Service, Platform as a
Service, Infrastructure as a Service, Database as a Service, Monitoring as a Service,
Communication as services. Service Providers- Google, Amazon, Microsoft Azure,
IBM, Sales force.

Unit-III

Collaborating Using Cloud Services Email Communication over the Cloud, CRM
Management, Project Management, Event Management, Task Management, Calendar,
Schedules, Word Processing, Presentation, Spreadsheet, Databases, Desktop, Social
Networks and Groupware.

Unit-IV

Virtualization for Cloud Need for Virtualization, Pros and cons of Virtualization,
Types of Virtualization, System VM, Process VM, Virtual Machine monitor, Virtual
machine properties, HLL VM, Hypervisors, Xen, KVM, VMware, Virtual Box,
Hyper-V.

Unit-V

Cloud Security: Infrastructure Security- Network level security, Host level security,
Application level security, Data security, Authentication in cloud computing, Cloud
security challenges.

References:

- Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010

- Cloud Computing: Concepts, Technology & Architecture by Thomas Erl

- James E Smith, Ravi Nair, Virtual Machines, Morgan Kaufmann Publishers,2006

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Subject Name- Computer Graphics	**Subject Code-05CAD104**
Semester-Fifth	**CreditValue-4[P=0, T=1, L=4]**

Unit-I

Introduction: Basic elements of Computer graphics, Applications of Computer Graphics. Graphics Hardware, Video Display Devices, Architecture of Raster and Random scan display devices, Input devices, Hard-copy devices, Graphics software.

Unit-II

Fundamental Techniques in Graphics: Line Drawing Algorithms: DDA Algorithm, Bresenham's Line algorithm, Circle Generating Algorithms: Midpoint Circle Algorithm. Filled-Area Primitives: Scan-line polygon fill algorithm, Inside Outside Tests, boundary Fill Algorithm, Flood- Fill algorithm.

Unit-III

Two- Dimensional Geometric Transformations: Basic Transformations Translation, Rotation, Scaling. Matrix representations and Homogeneous Coordinates, Composite Transformations. Other Transformations: Reflection, Shearing.

Unit-IV

Two-Dimensional Viewing: The Viewing Pipeline, Clipping operations: Point clipping, Line Clipping: Cohen Sutherland line clipping, Liang- Barsky line clipping, Nicholl-lee- Nicholl line clipping, Polygon Clipping: SutherlandHedgeman Polygon Clipping, Weiler-Atherton Polygon Clipping, Curve Clipping, Text Clipping, and Exterior Clipping.

Unit-V

Three-Dimensional Concepts and 3-D Transformations: 3-D display methods: Parallel projection, Perspective projection. Basic Transformations- Translation, Rotation, Scaling.

References:

● J.D.Foley, A.Van Dan, Feiner, Hughes Computer Graphics Principles & Practice 2nd edition Publication Addison Wesley 1990.

● D.Hearn, Baker: Computer Graphics, Prentice Hall of India 2008.

Subject Name- Lab: (Programming in JAVA)   **SubjectCode-05CAD105**

Semester-Fifth   **CreditValue-2[P=0, T=0, L=2]**

Lab Experiment List

- Program on strings.
- Programs to practice loops.
- Program to demonstrate all math class functions.
- Program on files.
- Program to demonstrate method over-riding and overloading
- Programs on Inheritances.
- Program to create a Date object using the Calendar class.
- Program to add some hours to the current time.
- Multi-threaded programming.
- Programs to demonstrate the use of container classes of JAVA.
- Programs to demonstrate Database Programming.
- Programs to queries MySQL database through JAVA.
- Creating and using Packages.
- Creating GUI applications using Java Swing.
- Creating Applications that uses GUI concepts as well as Database Programming Concepts.
- Create Clone of popular real-life windows Application using Swing and JDBC.

Subject Name-Artificial Intelligence   **SubjectCode-06CAD101**

Semester-Sixth   **CreditValue-4[P=0, T=0, L=4]**

Unit-I

Introduction: Introduction to Artificial Intelligence, Background and Applications, AI techniques, Tic Tac-Toe problem, Problem Characteristics.

Unit-II

Problem Solving and Searching Techniques: Problem Characteristics, Production Systems, Water Jug Problem, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search. 8-Puzzle Problem.

Unit-III

Knowledge Representation: Definition of Knowledge, Knowledge Based Systems, Representation of Knowledge. Introduction to First Order Predicate Logic, Conversion to clausal form, Unification, Resolution Principle.

Unit-IV

Expert Systems: Introduction to Expert Systems, Characteristic Features of Expert Systems, Applications of Expert Systems, Components and Working of Expert Systems

Unit-V

Introduction to Machine Learning Techniques: Fuzzy Logic, Fuzzy Set, Membership Function, Union, intersection and complement of a fuzzy set, Introduction to Artificial Neural Network, Introduction to Support Vector Machine.

References:

● DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.

● Russell & Norvig, Artificial Intelligence-A Modern Approach, LPE, Pearson Prentice Hall, 2nd edition, 2005.

● Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2nd edition, 1991.

● W.F. Clocksin and Mellish, Programming in PROLOG, Narosa Publishing House, 3rd edition, 2001.

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Subject Name-Web Technology	**SubjectCode-06CAD102**
Semester-Sixth	**CreditValue-4[P=0, T=0, L=4**]

Unit-I

Introduction to HTML: Basics of HTML, formatting and fonts, commenting code, hyperlink, lists, tables, images, forms, Meta tags, Character entities, frames and frame sets, Overview and features of HTML5.

Unit-II

Style Sheets: Need for CSS, Introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3

Unit-III

Introduction to JavaScript: JavaScript Variables and Data Types, Declaring Variables, Data Types, Statements and Operators, Control Structures, Conditional Statements, Loop Statements, Object-Based Programming, Functions, Executing Deferred Scripts, Objects, Message box in JavaScript, Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes, JavaScript with HTML, Events, Event Handlers, Forms, Forms Array.

Unit-IV

PHP: Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP

Unit-V

PHP Database Connectivity: Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP my admin and database bugs.

References:

● Jeffrey C. Jackson, "Web Technologies: A Computer Science Perspective", Prentice Hall, 2007

● JavaScript: The Good Parts by Douglas Crock ford

● HTML5 for Web Designers by Jeremy Keith

● The Art and Science of CSS: Create Inspirational, Standards-Based Web Designs by Cameron Adams

● Headfirst PHP & MySQL by Lynn Beighley & Michael Morrison

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Subject Name-Software Engineering   **SubjectCode-06CAD103**
Semester-Sixth   **CreditValue-4[P=0, T=0, L=4**]

Unit-I
Introduction: The Evolving Role of Software, Software characteristics, Software Engineering as a Layered Technology, Software Process Framework and Umbrella Activities, Process Models.

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

Unit-III
Software Project Management: Estimation in Project Planning Process, Project Scheduling. Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement,

Unit-IV
Software Engineering Principles &Tools: Tools of Design (Data Flow Diagrams, Data Dictionary, Decision Tree, Decision Tables), Modularization (Coupling)

Unit-V
Testing Strategies & Tactics : Software Testing Fundamentals, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

References:
● R.F.Fairley,, "Software Engineering Concepts", McGraw Hill.
● R.S.Press Man, "Software Engineering A Practitioners Approach" McGraw Hill.
● Rajib Mall, "Fundamentals of Software Engineering". PHI.
● Pankaj Jalote. "An Integrated Approach to Software Engineering", Narosa

Subject Name-C# with .NET Framework　　　　　**SubjectCode-06CAD104**
Semester-Sixth　　　　　　　　　　　　　　　　**CreditValue-4[P=0, T=0, L=4**]

Unit-I
The .NET Framework: Introduction, Common Language Runtime, Common Type System, Common Language specification, The Base Class Library, The .Net class library Intermediate language, Just-in time Compilation, Garbage Collection, Application Installation and Assemblies, Web services, Unified classes.

Unit-II
C# Basics: Introduction, Data Types, Identifiers, Variables and constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System collections, Delegates and Events, Indexes, Attributes, versioning.

Unit-III
C# Using Libraries: Namespace- System, Input Output, Multi-Threading, Networking and Sockets, Data Handling, Windows Forms, C# in web application, Error Handling

Unit-IV
Advanced Features Using C#: Web services, Windows services, messaging, Reflection, COM and C#, Localization.

Unit-V
Advanced Features Using C#: Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, CASE Study (Messenger Application)

References:

● Jeffrey Richter, "Applied Microsoft .NET Framework Programming", (Microsoft) ● Fergal Grimes, "Microsoft .Net for Programmers", (SPD)
● Balagurusamy, "Programming with C# ", TMH
● Wiley," Beginning Visual C# 2008", Wrox

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Subject Name- Lab: (Web Technology and C#)	**SubjectCode-06CAD105**
Semester-Sixth	**CreditValue-2[P=0, T=0, L=2**]

Lab Experiment List

● Calculate Hypotenuse of triangle using dynamic initialization of variables
● Develop a C# application to print the students list using classes and objects
● Develop a C# application to implement inheritance concepts Single Inheritance,
Multilevel Inheritance, Multiple Inheritance.
● Develop a console application to implement operator overloading concept in C# Unary
Operator Overloading, Binary Operator Overloading
● Develop a C# application to implement multithreading.
● Develop a c# console application to implement the following concepts: Delegates,
Events
● Design a window based application using C#
● Design windows based messenger application.
● Learn HTML fundamentals.
● Create WebPages with HTML, CSS.
● Practice JavaScript.
● Create dynamic WebPages.
● Create a real life website.