DEPARTMENT OF COMPUTER SCIENCE
MAHATMA GANDHI UNIVERSITY

B.Sc/BA Computer Applications (Voc)
Choice Based Credit System (CBCS)

Semester I			Marks					
Paper Code	Course Title	Course Type	Theory	Internals	Practical /Lab	Total	HPW	Credits
CAVO101	Fundamentals of Computers	DSC-1A	80	20	50	150	3T+6P=9	3+3=6
CAVO 102	Programming Methodology (C language)	DSC-2A	80	20	50	150	3T+6P=9	3+3=6
Semester-II								
CAVO 201	Computer Organization	DSC-1B	80	20	50	150	3T+6P=9	3+3=6
CAVO 202	Internet Technologies	DSC-2B	80	20	50	150	3T+6P=9	3+3=6
Semester-III								
CAVO301	SEC	SEC-1	50			50	2	2
CAVO302	Object Oriented Programming in C++	DSC-1C	80	20	50	150	3T+6P=9	3+3=6
CAVO303	Multimedia and Internet Applications	DSC-2C	80	20	50	150	3T+6P=9	3+3=6
Semester-IV								
CAVO401	SEC	SEC-2	50			50	2	2
CAVO402	Database Management System	DSC-1D	80	20	50	150	3T+6P=9	3+3=6
CAVO403	Data Structures in C	DSC-2D	80	20	50	150	3T+6P=9	3+3=6

- *DSC (Discipline Specific Course)*
- *SEC (Skill Enhancement Course)*

Semester-V			Marks					
Paper Code	Course Title	Course Type	Theory	Internals	Practical /Lab	Total	HPW	Credits
CAVO 501	SEC	SEC-3	50			50	2	2
CAVO 502	Operating System	DSC-1E	80	20	50	150	3T+6P=9	3+3=6
CAVO 503	Electronic Commerce	DSC-2E	80	20	50	150	3T+6P=9	3+3=6
CAVO 504	Software Engineering	DSC-3F	80	20		100	4T	4
Semester-VI								
CAVO 601	SEC	SEC-4	80	20	50	150	2	2
CAVO 602	Software Testing & Maintenance	DSC-2F	80	20		100	4T	4
CAVO 603	Programming in Java	DSC-3F	80	20	50	150	3T+6P=9	3+3=6
CAVO 604	Project Work	DSC-4F			150	150	6P	3
CAVO 605	Seminar	DSC-5F			50	50	2T	2

- *DSC (Discipline Specific Course)*
- *SEC (Skill Enhancement Course)*

SYLLABUS

I Year :Semester-I
CAVO 101: Fundamentals of Computers

Unit:-I : Introduction, Characteristics and limitations of computer, Block Diagram of Computers, Types of Computers, Types of Programming languages (Machine languages , Assembly Language, High level Language), Types of Memory(Primary and Secondary), Input and Output devices,

Unit –II: Operating Systems: Definition, Functions and Types of Operating Systems– Disk Operating System: Internal and External Commands-Computer Virus, Windows operating system - Desktop, Start menu, Control panel, Windows accessories

Unit –III
MS Word: Features of word processing – disadvantages and applications of word processing - Parts of MS Word application window –Creating, Saving and closing a document Opening and editing a document – Cut, Copy Paste Working with Tables.

Unit-IV
MS EXCEL: Features of MS Excel – Spread sheet / worksheet, cell, cell address - Parts of MS Excel window – Saving, Opening and Closing workbook –Formulas and its advantages – different types of functions available in Excel –Charts –Data Sorting

Practical :
Note :
- ➢ All the concepts of program from text book including exercises must be practice, execute and write down in the practical record book.
- ➢ Faculty must take care about UG standard programs it should be minimum 25-30
- ➢ In the external lab examination student has to execute at least two programs with compilation and deployment steps are necessary
- ➢ External Viva-voce is compulsory

1. MS DOS & Windows Operating System
2. MS Excel or Libre Office Calc).
3. MS Word or Libre Office Writer):

CAVO 102: PROGRAMMING METHODOLOGY (in 'c' Language)

Unit-I : Introduction to C, History of Language, Data Types, Operators(Arithmetic, Increment & Decrement, Modulo Division, Relational, Logical, Bitwise , conditional and assignment Operators)

Unit-II: Decision Making & Looping: Introduction - If statements - If-else statements - Switch statements - Conditional statements - While & Do while statements - For Statements.

UNIT-III: **ARRAYS AND STRINGS**: Arrays: Introduction - Defining an array - Initializing an array - One dimensional array – Two dimensional array - Dynamic array. Strings: Introduction - Reading and Writing strings - String handling functions.

UNIT-IV: Built-in functions and user-defined functions-function calls - Recursive functions,
Structures: Introduction - Declaring structures variables - Functions and Structures - Array of structures - Enumerated Data types - Introduction to Unions.
Pointers: Fundamentals - Understanding pointers - Address - Declaration of Pointers

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Programming Lab in 'c'
  1. Operators, Expressions.
  2. Functions and program Structure
  3. Pointers and Arrays
  4. Structure and files.

CAVO 201: Computer Organization

Unit-I
Block Diagram of Computers, Micro Processor & Micro Computer, Types of Buses, Computer Software (System and application software)

Unit-II
Number Systems: Introduction, Decimal, Binary, Octal, Hexadecimal System, Conversions, Simple addition, Complements.

Unit-III
Introduction Logic Gates: Basic Gates (AND, OR , NOT), Universal Gates (NAND, NOR). Introduction to Boolean algebra: Boolean Laws , Product of Sums, Sum of Product, Minimization of Boolean Algebra.

Unit-IV
Memory Organization: Memory Hierarchy, Main Memory, RAM, ROM Chips, Cache Memory, I/O mapped I/O, Memory Mapped I/O, Stack.

Practical:
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 By using simulator S/W.
  ➢ Logic gates (AND, OR, NOT)
  ➢ Universal building blocks
  ➢ De Morgan Laws

CAVO 202: Internet Technologies

Unit-I :
Introduction to Hypertext Markup Language (HTML),creating web pages, Basic Tags of HTML: HTML, HEAD, TITLE, BODY , Formatting tags, Lists, Hyperlinks, Tables, Web Forms, Inserting Images, Frames.

Unit-II:
VBScript: Introduction, Adding VBScript code to HTML page, Data types, operators, functions, control structures, user interaction in VB script and arrays.

Unit-III: DHTML, Programming in DHTML, DOM, CSS (cascading Style Sheet), Creating multimedia Effects with Filters, event handling.

Unit-IV: Introduction to XML, Features of XML, and Creating XML documents, XML Vocabularies, Markup language s and extensible style sheet language, XSL Transformation, Document Object Model(DOM).

PRACTICAL:
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  ➢ External Viva-voce is compulsory

A topic based homepage has to be to be developed by each student using various commands covered in HTML and VBScript
 Web page should be designed with following features.
 • HTML Basic Tags (html/head/title/body/B/I/U/BR/HR)
 • Anchor/Image insertion/Linking
 • Tables/Frame/Form
 • CSS
 • XML Markup / Declarations / Element Content Model

II Year: Semester III
CAVO 302 : OBJECT ORIENTED PROGRAMMING IN C++(Theory).

Unit-I: Data types, operators and statements, Control statements, Functions, Arrays, Pointers, Structures and Unions.
Unit-II: Classes and objects, Constructors and destructors, object life times. The Meta class, Inheritance and Classification hierarchies.
Unit-III: Introduction to polymorphism, Function overloading, Operator overloading, polymorphism by parameter.
Unit-IV: Method polymorphism, Run-time Polymorphism, Container classes, Multiple Inheritance.

PRACTICALS
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PROGRAMMING LAB-C++

1. Implementation of Classes and objects.
2. Implementation of the concepts Encapsulation, Inheritance and Polymorphism.
3. Implementation of the concepts including dynamic objects, operator overloading, multiple inheritance. Polymorphism, Aggregation, Templates, data containers, file handling.

CAVO 303: MULTIMEDIA AND INTERNET APPLICATIONS

UNIT I: Multimedia introduction, Definition, Multimedia applications (Business, Schools, home, Public Places)

Text : Meaning , Fonts and Faces, Using text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hyper Text

UNIT II :
Images : Create images , Making still images , color.
Sound : The power of Sound , Digital Audio, MIDI Audio, MDI vs Digital Audio, Multimedia Systems Sounds, Audio File Formats

UNIT III
Animations: The power of motion, Principles of Animation, Animation by Computer
Video: Uses of Video Shooting and Editing Video, Types of video signals, analog video, digital video

UNIT IV : The internet Multimedia : Internet History , Multimedia on Web, Multimedia components, World Wide Web, Multimedia File formats, Social Media, Internet Applications, Flash Player, Visual Effects.

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Practical exercises based on concepts listed in theory using presentation tools in office automation tool/GIMP/Blender/Audacity/Animation Tools/Image Editors/Video Editors.
1.Create an animation using the tools panel and the properties panel to draw the following –
Line, oval, circle, rectangle, square, pencil, brush, lasso tool.
2.create an animation using text tool to set the font , size, color etc.
3. Create an animation using Free transform tool that should use the following.
Move objects, skew objects, stretch objects, rotate objects, stretch objects while maintaining
4.create an animation using layers having following features.
Insert layer, delete layer, mask layer

CAVO 402: DATABASE MANAGEMENT SYSTEM (Theory):

Unit-I : Introduction and E-R model, purpose of a database system. Data models, Data abstraction, Data independence, DDL, DML, DCL, DBA, Entities and entity sets.

Unit-II: Relation ship Definition –Degrees of relationship –Unary Relationship, Binary Relationship, Ternary Relationship, specialization – Generalization –Aggregation. Relational Algebra-Union, Intersection, Difference, Product, Project, Join, Select, divide, assignment, Functional dependency, Normalization –Meaning of Normalization, uses of Normalization, steps in Normalization, First normal form (1NF), second normal form (2NF), third normal form,(3NF), Boyce Codd Normal Form (BCNF), Comparison of BCNF and 3NF.

Unit-III: File and system structure, Physical Storage media, File Organization. Buffer management, B-tree Indexed files, static and dynamic hash functions.

Unit-IV Distributed database system: Distributed data storage-Replication, fragmentation. Concurrency control, Deadlock Handling and coordination.

Practical
Note :
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   - ➢ External Viva-voce is compulsory

Practical

Programming Lab (Oracle)

   1. Creation of databases (Exercising the commands form creation).

   2. Simple to complex condition query creation using SQL Plus.
   3. Using Triggers.
   4. Creation of Forms for student information, library information, pay roll etc., Writing PL/SQL procedures form data validation.
   5. Forms designing, database control through forms Report generation.

CAVO 403 :Data structures in 'c'

UNIT-I

Lists: Concepts and terminology, arrays, storage structure for arrays. Static and dynamic structures, Stacks definitions, operations and applications. Array implementation of stacks. Queues definitions, and Limitation of queues, circular queues, application of queues.

UNIT-II

Table and information retrieval: rectangle arrays, tables of sequential search, binary search, hashing, sorting, selection sort, shell sort, merge sort, quick sort.

UNIT-III

Trees Definitions and Concepts: binary tree: operations on binary tree, and representation of binary trees, AVL trees and Operations on AVL trees.

UNIT-IV

Graphs: definitions and representations of graphs, graph traversals, B trees: operation on B trees.

Practical:

Note :

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  - Faculty must take care about UG standard programs it should be minimum 25-30
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Programming Lab-(Data Structures in 'C')

  Implementation of Stacks, Queues.

  Infix to Post fix conversing, evaluation of postfix expression .

  Polynomial arithmetic using linked lists .

  Implementation of binary search and hashing

  Implementation of traversal on binary tree .

  Implementation of heap sort .

  Implementation of operations on AVL trees .

  Implementation of traversal on graph .

  Implementation of B-tree .

III Year : Semester-V
CAVO 502: OPERATING SYSTEMS

UNIT-I
Operating Systems
Operating system, classifications of operating, Architecture for O.S
Unit-II
Processor Management: multiprogramming, multitasking, Process Synchronization - Critical section and mutual exclusion problem, classical synchronization problems,
Unit-III:
Deadlock - conditions for deadlock, deadlock prevention, Multithreading, client-server
Unit –IV
Memory Management: Classical memory management techniques, paging, segmentation, virtual memory, Architecture the **memory hierarchy**
File Management: Overview of file management system, disk space management, directory structures. Protection domains, access control lists, protection models.

Suggested Reading
1. Charles Crowley - Operating Systems - A design Oriented Approach, McGraw 1997

PRACTICAL:
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  ➢ External Viva-voce is compulsory
 (Windows-xp/7/8)
1. Installation of Windows.
2. Creation of users
3. Adding printers.
4. Configuring TCP/IP, DHCP
5. Backup and restoration of files
6. Configuring windows and other PC clients to the network

CAVO 503: Electronic Commerce

Unit-I
E-commerce Introduction, internet and networking technologies, Internet and network protocols, Classification of E-commerce,

Unit –II E-Commerce Applications: Entertainment, E-Marketing, E-Advertising, Search Engines, E-Banking, Mobile Commerce, Online Trading, E-Learning, E-Shopping.

Unit-III: Electronic Payment Systems: Advantages and risks, Types of Payment System (Credit Card, Debit Card, Smart Card, E-Money, And Electronic Fund Transfer (EFT)

Unit IV: Electronic Data Interchange: Prerequisites for EDI, Issues of EDI: Legal issues, Security issues and Privacy issues

Practical:
Note :
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  ➢ In the external lab examination student has to execute at least two programs with compilation and deployment steps are necessary
  ➢ External Viva-voce is compulsory
Web page should be designed with following features.
 • HTML Basic Tags (html/head/title/body/B/I/U/BR/HR)
 • Anchor/Image insertion/Linking
 • Tables/Frame/Form

III Year : Semester -V
CAVO 504: Software Engineering
UNIT-I
    Introduction to software engineering: Project size and its categories. Planning a software project. Software development life cycle .Resources needed in software projects .

UNIT-II
    Software cost estimation: Cost factor, Cost estimation techniques-Expert judgment, Delphi cost estimation, Work break down structures, Algorithmic Cost Models (COCOMO), Software requirement specification, Data flow diagram
UNIT-III
    Software design: Fundamental design concepts and relations-(information hiding, structure, modularity, concurrency, verification).Module design techniques-(Cohesion, Coupling). Levels of design(architectural design, Data design, procedural design), Structured coding techniques. Documentation.
UNIT-IV
    Verification and Validation techniques. Quality assurance. Testing .Software Reliability: Software errors. Faults. Repair and availability. Software maintenance, Maintenance tools techniques.

CAVO 602 :SOFTWARE TESTING & MAINTENANCE)

Unit I: - Example test series – First, second, sequential cycles; Objectives and limitations of testing; Testing Software development process – planning stage, design stage, glass box, code testing, regression testing, black box testing, software errors.   Reporting   and   analyzing bugs – problem report, contents, characteristics, analysis of reproducible bug and making a bug reproducible.

Unit II: - Establishing a software testing strategy & methodology, determining software testing techniques, eleven steps of software testing process – overview, Assess project management.

Unit III: - Development of a test plan, requirement of phase testing, design of phase testing, program phase testing, execution and accepting of testing.

Unit IV - Software maintenance – definition, characteristics, tasks, side effects, maintainability, reverse and reengineering. Configuration items, SCM process, version control, change control, configuration audit, status reporting.

III Year : Semester-VI
CAVO 603: Programming in Java

UNIT-I

Introduction: The java programming language, downloading the java development kit, installing the JDK, Creating and running a program in Microsoft windows, Analysis of the Hello world program. Data types, Comments, programs with input. Variables and objects. Arithmetic and assignment operators.

Strings: The string class. Substring, changing case, concatenation, locating a character within a string. Replacing characters in a string. . The string buffer class.

UNIT-II

Selection: The if statement, if-else statement, if-else-if statement combination, Nested conditionals, Compound statement. Switch statement. Iteration: While statement, do-while statement and for statement.

UNIT-III

Methods: Simple examples, local variables, methods often invoke other methods, methods that invoke themselves, overloading.
Class: Class declarations. Modifiers, Constructors, Copy constructors, Default constructors.

UNIT-IV

Array and Vectors: Character arrays, properties of arrays in java, copying an array, the vector class, the size and capacity of a vector object, changes to the vector class in java 1.2, two-dimensional arrays.

Graphics: the AWT libraries, the frame class, the color class, components, the button class, managing layouts, applets, threads, exceptions.

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PRACTICAL:

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Programming Lab-

programming Lab-(java)(100 Hours).

  1. Running java applications and applets
  2. Creating an application using java AWT
  3. Creating an application using java AWT image .
  4. Creating an application using java . Peer for M/S –windows .
  5. Creating an applet user interfaces .
  6. A simple network client applet .
  7. Handing error using expectations .
  8. Deadlock and dinning philosopher problems using threads.
  9. Creating an application with URLs.
  10. Creating an data gram client and view

III Year: Semester-VI
CAVO 604: Project Work

<u>SOFTWARE DEVELOPMENT LAB II (Main Project)</u>

The project topic shall be chosen from areas of current day interest using latest packages/ languages running on appropriate platforms, so that the student can be trained to meet the requirements of the Industry. A project report shall be submitted in hard bound complete in all aspects. For internal evaluation, the progress of the student shall be systematically assessed through various stages of evaluation at periodic intervals

- Software selection is Student choice
- Designing-coding Documentation-presentation-System Study and Record
- Submission.

III Year :Semester-VI

CAVO 605: SEMINAR

(STUDENT CHOICE)

MODEL PAPER
FACULTIES OF ARTS &SCIENCE
B.A/B.Sc (Vocational) I - Year Examination-2016
Semester-I
Subject: **Computer Applications – CAVO102**
Paper –II : Programming Methodology(C language)

Time: 3 Hours   Max.Marks:80

Part-A (4 x 5=20)

Note: Answer four of the following questions

1. Define expression? Explain type casting with examples

2. Describe the Increment and Decrement operators

3. Difference between while and do-while?

4. Write a c program to find the given number is prime or not?

5. Explain about switch ( ) statement with example

6. Explain call-by-value and call-by-reference.

Part-B(4X15=60 Marks)

Note: Answer all questions choosing one from each unit.

7. a) Explain Bitwise operators with examples.
                    OR
    b) Explain data types with examples.

8. a) Give syntax of while loop and for loop with examples ?
                    OR
    b) Give syntax of if and if-else statement with examples.

9. a) Define functions with examples.
                    OR
    b) Write a recursive function to find the factorial of a given number

10. a) Explain Two-Dimensional arrays with examples
                    OR
    b) Explain pointers with examples.