Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain-IBM)

Choice Based Credit System (CBCS) 2021-25

SEMESTER I

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTMACS 101	BS	Mathematics-I	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

The student will have ability to:

1. To introduce the students with the Fundamentals of the Calculus of Matrices, Differential Equations and Numerical Analysis.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The students will be able to

1. Understand and apply the basics of the differential calculus.
2. Know the fundamental principles of the integral calculus and apply them.
3. Apply the techniques in the numerical analysis.
4. Know the numerical solution of the system of linear algebraic equations.
5. Understand and apply the basics of the vector calculus.

Syllabus:

UNIT I **10 HRS**

Differential Calculus: Limits of functions, continuous functions, uniform continuity, montone and inverse functions. Differentiable functions, Rolle'stheorem, mean value theorems and Taylor's theorem, power series. Functions of several variables, partial derivatives, chain rule, Tangent planes and normals. Maxima, minima, saddle points, Lagrange multipliers, exact differentials

UNIT II **9 HRS**

Integral Calculus: Riemann integration, fundamental theorem of integral calculus, improper integrals. Application to length, area, volume, surface area of revolution. Multiple integrals with application to volume, surface area, Change of variables.

UNIT III **8 HRS**

Numerical Analysis:Number Representation and Errors: Numerical Errors; Floating Point Representation; Finite Single and Double Precision Differences; Machine Epsilon; Significant Digits.

Numerical Methods for Solving Nonlinear Equations: Method of Bisection, Secant Method, False Position, Newton-Raphson's Method, Multidimensional Newton's Method, Fixed Point Method and their convergence.

UNIT IV **7 HRS**

Numerical Methods for Solving System of Linear Equations: Norms; Condition Numbers, Forward Gaussian Elimination and Backward Substitution; Gauss-Jordan Elimination; FGE with Partial Pivoting and Row Scaling; LU Decomposition; Iterative Methods: Jacobi, Gauss Siedal; Power method and QR method for Eigen Value and Eigenvector.

UNIT V **8 HRS**

Vector Calculus: Gradient and directional derivative. Divergence and Curl of Vector point function, line and surface integrals. Green‟s, Gauss‟ and Stokes‟ theorems and their applications.

Text Books:

1. T. M. Apostol, Calculus, Volume I, 2nd Ed, Wiley, 1967.
2. T. M. Apostol, Calculus, Volume II, 2nd Ed, Wiley,1969.
3. K. E. Atkinson, Numerical Analysis, John Wiley, Low Price Edition(2004).
4. S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw-Hill,2005.
5. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers,Delhi

Reference Books:

1. R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley,1999.
2. J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint,2003.
3. J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint,2003.
4. J. D. Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill,2001.
5. M.K Jain, S.R.K Iyengar and R.K Jain, Numerical methods for scientific and engineering computation (Fourth Edition), New Age International (P) Limited, New Delhi,2004.
6. S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill2008.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTPH101	**BS**	**Applied Physics**	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To develop the comprehensive understanding of laws of physics.
2. To develop ability to apply laws of physics for various engineering applications.
3. To develop the experimental skills, ability to analyze the data obtained experimentally to reach substantiated conclusions.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The students will be able to

1. Student will be able to comprehend laws of physics.
2. Student will be able to apply laws of physics for various engineering applications.
3. Student will be able to determine physical parameter experimentally and will be able to analyze the data obtained experimentally to draw substantiate conclusions.

Syllabus:

UNIT I **10 HRS**

Quantum Physics: Introduction to Quantum hypothesis, Matter wave concept, Wave Group and Particle velocity and their relations, Uncertainty principle with elementary proof and applications to microscope and single slit, Compton Effect, Wave function and its physical significance. Development of time dependent and time independent Schrodinger wave equation, Applications of time independent Schrodinger wave equation.

UNIT II **9 HRS**

Solid State Physics: Free electron model, Qualitative Analysis of Kronig Penney Model, ffective mass, Fermi level for Intrinsic and Extrinsic semiconductors, P-N junction diode, Zener diode, Tunnel diode, Photodiode, Solar- cells, Hall Effect, Introduction to Superconductivity, Meissner effect, Type I & II Superconductors.

UNIT III **8 HRS**

Nuclear Physics: Nuclear Structure & Properties Nuclear models: Liquid drop with semi-empirical mass formula & shell model. Particle accelerators: Cyclotron, Synchrotron, Betatron. Counters and Detectors: Giger-Muller counters, Bainbridge Mass Spectrograph and Auston Mass Spectrograph.

UNIT IV **7 HRS**

Laser & Fiber Optics: Stimulated and Spontaneous Emission, Einstein's A&B Coefficients, Population Inversion, Pumping, Techniques of Pumping, Optical Resonator, Properties and Applications of Laser, Ruby, Nd:YAG, He-Ne lasers. Introduction to Optical fibre, Acceptance angle and cone, Numerical Aperture, V- Number, Ray theory of propagation through optical fibre, Pulse dispersion , applications of optical fibre.

UNIT V **8 HRS**

Wave Optics: Introduction to Interference, Fresnel's Bi-prism, Interference in Thin films, Newton's rings experiment, Michelson's interferometer and its application, Introduction to Diffraction and its Types, Diffraction at single slit, double slit, resolving power, Rayleigh criterion, Resolving power of grating, Concept of polarized light, Double refraction, quarter and half wave plate, circularly & elliptically polarized light.

Text Books:

1. Engineering Physics by Dr. S. L. Gupta and Sanjeev Gupta, Dhanpat Rai Publication, New Delhi.
2. Engineering Physics by Navneet Gupta, DhanpatRai Publication, New Delhi.
3. Engineering Physics by H. J. Sawant, Technical Publications, Pune, Maharastra.
4. Engg Physics by M.N. Avdhanulu& P.G. Kshirsagar, S.Chand&Co.Edition (2010).
5. Fundamentals of Physics by Halliday, Wiley, India.

Reference Books:

1. Concepts of Modern Physics by Beiser, TMH, New Delhi.
2. Solid State Physics by Kittel,Wiley India.
3. Atomic and Nuclear physics by Brijlal and Subraminiyan.
4. LASERSs and Electro Optics by Christopher C. Davis, Cambridge Univ. Press (1996).
5. Optroelectronics an Introduction by J. Wilson &J.F.B.Hawkes, "" Prentice-Hall II Edition.

6. LASER theory and applications by A. K. Ghatak&Tyagarajan, TMH (1984).
7. Optics by Ghatak, TMH.

List of Practical:

1. Measurement of radius of curvature "R" of convex lens by Newton's ring experiment.
2. Measurement of Numerical aperture of fiber by LASER.
3. Determination of Energy band gap 'E_g' of Ge using Four Probe method.
4. Measurement of Frequency of A.C. mains by electrically maintained vibrating rod.
5. Measurement of Resolving Power of Telescope.
6. Measurement of "λ" of LASER light source using Diffraction Grating.
7. Determination of Planck's constant by using photocell.
8. Determination of Energy band gap (E_g) using PN Junction Diode.
9. To determine the mass of cane sugar dissolved in water using half shade polarimeter.
10. To study forward and reverse characteristics of Zener diode.
11. To study forward and reverse characteristics of P-N diode.
12. To study characteristics of Photo diode.
13. To study characteristics of LDR.
14. μ and ω of given prism using spectrometer.
15. Measuring height of a given object using Sextant.

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Choice Based Credit System (CBCS) 2021-25

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTEC104	DC	Digital Logic and Circuit Design	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

The objective of this course is to-

1. Use of Boolean algebra and Karnaugh Map to simplify logic function.
2. Describe the operation of different Combinational and Sequential Logic Circuits.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The students will be able to

1. Design an optimal digital logic circuit to meet the given specifications.
2. Evaluate the performance of the given digital logic circuit based on specific criteria for reliable system implementation.

Syllabus:

UNIT I **10 HRS**

Number System & Codes: Introduction to number systems, Binary numbers, Octal & Hexadecimal Numbers, Number base Conversion, Signed binary numbers : 1's Complement & 2's Complement representation and their arithmetic operation, Floating point representation, binary codes, BCD,ASCII, EBCDIC, Gray codes, Error detecting and Correcting codes, Hamming codes.

UNIT II **9 HRS**

Boolean algebra and Logic gates: Introduction, Logic operations, Axioms and laws of Boolean algebra, Demorgan's theorem, Boolean functions, Canonical and standard forms. Logic gates and their applications, universal gates, NAND-NOR implementation of logic functions. Minimization techniques for logic functions-K-map, Tabular / Quine McCluskey method.

UNIT III **8 HRS**

Combinational logic: Arithmetic circuits- Half adder, Full adder, Halfsubtractor, Full subtractor, Parallel and Serial adder, BCD adder, Multiplexer, De-multiplexer, Encoder & Decoder.

UNIT IV **7 HRS**

Sequential logic: Introduction, Latch and Flip Flop- S-R, D, JK and T, State diagram, characteristic equation, state table and excitation table, Flip flop conversion, applications of Flip flop, Counters, Registers.

UNIT V **8 HRS**

Semiconductor Memories and A/D and D/A converters: Semiconductor Memory – RAM, ROM Organization, operation and their Types, PLD- PAL, PLA, PROM, FPGA, Analog to Digital (A/D)and Digital to Analog (D/A) converters and their types.

Text Books:

1. M. Morris Mano,"Digital Logic and Computer Design", Pearson Education, 2016.
2. S Salivahanan and S Arivazhagan: Digital Circuits and Design,4th Edition, Vikas Publishing House,2012.

Reference Books:

A. Anand Kumar, "Fundamentals of Digital Circuits", 4th Edition, PHI, 2016.
1. Floyd and Jain,"Digital Fundamentals", 10th Edition, Pearson Education India, 2011.
2. Roland J.Tocci,Widmer,Moss, "Digital Systems Principles and Applications", 10th Edition, Pearson 2009.
3. Stephen Brown, ZvankoVranesic, "Fundamentals of Digital Logic Design", 3rd Edition, McGraw Hill, 2017.

List of Practical:

1. To study and test of operation of all logic gates for various IC"s (IC7400,IC7403,IC408,IC74332,IC7486).
2. Verification of DeMorgan's theorem.
3. To construct of half adder and full adder.
4. To construct of half subtractor and full subtractor circuits.
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Design a BCD to excess 3code converter.
8. Design a Multiplexer/ Demultiplexer
9. Analysis of various flip flops with Preset and Clear capability.
10. Design of Johnson and Ring counter.
11. Design of synchronous and asynchronous up/down counters.

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Choice Based Credit System (CBCS) 2021-25

SEMESTER I

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS101N	DC	Introduction to Computer Science and Engineering	60	20	20	0	50	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To introduce the fundamentals concepts of Computer system.
2. To introduce about history of Computer.
3. Understanding the basic concepts and features of various kinds of Operating systems.
4. Learning the Concepts of Office Automation Tools.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The students will be able to

1. Understand the basic terminologies of Computer System.
2. Gain knowledge about various kinds of Operating Systems and their features.
3. Learn the Concepts of Office Automation Tools.

Syllabus

Unit-I **10HRS**

Introduction to Computer Fundamentals: Introduction to Computer, Objectives, Hardware and Software, Block Diagram of the Computer, Functions of the different Units, Applications of Computers Representation of data and information, Computer Languages, Machine language, Assembly Language, High level Language, Number System and Conversion, Classification and History of Computers, Introduction to Free and Open Source Software, Computer Virus, Use of Antivirus software.

Unit-II **8HRS**

The Operating System: The Graphical User Interface (GUI), Definition of Operating System, Objective, Types and Functions of Operating Systems, Windows Operating System, Installing MS Windows, Working with Windows Operating System, System Tools and Applications in Windows, MS-DOS, Basic DOS commands, Comparison of DOS and Windows, case study of Unix, Linux OS.

Unit-III **9HRS**

Office Automation Tools-I: Word Processing Basics, Elements of word Processing and Working Objectives, MS-Word Screen and its Components ,MS-Office ,Working with MS-Word, Menu Bar, Creating Documents, Using Templates, Saving a documents, Working with documents, Setting up pages of a document, Printing Documents with different options, Using Tables and Columns, Object Linking and Embedding, Hyperlink, Envelopes & Label Creation, Grammar & Spell Check, Mail Merge, Macro Creation, Previewing and Printing Documents.

Unit-IV **7HRS**

Office Automation Tools-II: Spread Sheet: Introduction to MS-Excel, Starting MS-Excel, Basics of Workbook and Spreadsheet, MS-Excel Screen and Its Components, Features of Excel, Elementary Working with MS-Excel, Manipulation of cells, Formatting of Spreadsheet and Cells, Formulas and Functions, Spread sheets for Small accountings, Previewing and Printing a Worksheet.

Unit-V **8HRS**

Office Automation Tools-III: Power-point: Introduction to MS-PowerPoint, Basics of PowerPoint, MS- PowerPoint Screen and Its Components, Features of PowerPoint, Elementary, Elementary Working with MS-PowerPoint, Preparation of Slides, Creation of Presentation, Providing aesthetics, Slide Manipulation and Slide Show, Presentation of the Slides.

Text Books:

1. E Balagurusamy , “Fundamentals of Computers ”,TMH .
2. Silakari and Shukla, “Basic Computer Engineering ”, Wiley India.
3. V. Rajaraman, Neeharika Adabala, “Fundamentals of Computers”, PHI
4. Ajoy Kumar Ray and Tinku Acharya ,“ Basic Computer Engineering”, PHI.
5. P K Sinha ,“Fundamentals of Computers ” , BPB Publications.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain-IBM)

Choice Based Credit System (CBCS) 2021-25

SEMESTER I

References:

1. J. P. Tremblay and R.B. Bunt, "An Introduction of Computer Science –An Algorithmic Approach",TMH.
2. Faithe Wempen , "Computing Fundamentals: Introduction to Computers ", Wiley.
3. Norton, Peter, "Introduction to Computers", Fourth revised ,Mc-Graw-Hill.
4. Reema Thareja , "Fundamental of Computers", Oxford University Press.

List of Experiments:

1. Study and Perform different MS –DOS Commands(Internal and External).
2. Create the "test" directory in the directory you are currently in using MS-DOS.
3. Study of Word – Templates, Styles.
4. Create a new user and give it Administrator privilege for Microsoft windows OS.
5. Create a MS-Word .doc file contain your complete CV.
6. Study and perform different Excel Commands/Functions.
7. Perform MS-Excel Accounting.
8. Create a MS-Excel .xls file contain mark sheet.
9. Display the student's result into a chart using MS-Excel.
10. Create a MS-Power Point Presentation .ppt file covers the topic "Computer's Evolution".
11. Create a MS-Power Point Presentation .ppt file covers the topic "social responsibility".
12. Create a MS-Access database .mdb file to store the results of students

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Choice Based Credit System (CBCS) 2021-25

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS102N	DC	Principles of 'C' language	60	20	20	30	20	2	0	2	3

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

The student will have ability to:

1. Identify situations where computational methods and computers would be useful.
2. Give a computational problem, identify and abstract the programming task involved.
3. Approach the programming tasks using techniques learned and write pseudo-code.
4. Choose the right data representation formats based on the requirements of the problem.
5. Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
6. Write the program on a computer, edit, compile, debug, correct, recompile and run it.
7. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes. The students will be able to

1. Understand the basic terminologies used in computer programming.
2. Proficient in using the basic constructs of C, to develop a computer program.
3. Understand the use of functions, pointers, arrays and files in programming.
4. Understand the fundamentals of procedure-oriented programming and be able to apply it in computer program development.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain-IBM)

Choice Based Credit System (CBCS) 2021-25

SEMESTER I

Syllabus

UNIT I **7HRS**

Introduction to Programming Languages: Evolution of Programming Languages, Structured Programming, The Compilation Process, Object Code, Source Code, Executable Code, Operating Systems, Interpreters, Linkers, Loaders, Fundamentals Of Algorithms, Flowcharts.

UNIT II **10HRS**

Introduction to 'C' Language: Character Set. Variables and Identifiers, Built-In Data Types. Variable Definition, Arithmetic Operators and Expressions, Constants And Literals, Simple Assignment Statement, Basic Input/ Output Statement, Decision Making Within A Program, Conditions, Relational Operators, Logical Connectives, If Statement, If-Else Statement, Loops: While Loop, Do While, For Loop. Nested Loops, Switch Statement.

UNIT III **8HRS**

Arrays and Pointers: Array Manipulation; Searching, Insertion, Deletion of an Element from an one dimensional Array; Finding the Largest/Smallest Element in an Array; Two Dimensional Arrays, Addition/Multiplication of Two Matrices, Transpose of a Square Matrix, Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Pointer Arrays.

UNIT IV **7HRS**

Functions: Modular Programming and Functions, Prototype of a Function: Parameter List, Return Type, Function Call, Block Structure, Call by Reference, Call by Value, Recursive Functions and Arrays as Function Arguments

UNIT V **8HRS**

Structure: Structure Variables, Initialization, Structure Assignment, Structures and Arrays: Arrays of Structures.

Text Books:

1. Gottfried BS – Programming with C, TMH publications.
2. David Griffiths**, "**Head First C: A Brain-Friendly Guide**"** O Reilly Media Inc. 2011.
3. Allen B. Tucker, "Programming Languages", Tata McGraw Hill.
4. Tennence W.Pratt, "Programming languages design and implementation", Prentice Hall of India.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain-IBM)

Choice Based Credit System (CBCS) 2021-25

SEMESTER I

References:

1. Herbert Schildt "C: Complete Reference", Tata McGraw Hill 2000.
2. Yashwant Kanetkar, "Let us C", BPB Publication, 16th Edition 2018.
3. Fundamentals of Programming Languages, R. Bangia,Cyber Tech .
4. Greg Perry and Dean Miller, "C Programming Absolute Beginner's Guide 3rd Edition", Que Publishing 2013.

List of Experiments:

1. Write a C program to display "This is my first C Program".
2. Write a C program to calculate area and circumference of a circle.
3. Write a C program to perform addition, subtraction, division and multiplication of two numbers.
4. Write a program to calculate simple and compound interest.
5. Write a program to swap values of two variables with and without using third variable.
6. Write a program to display the size of every data type using "sizeof" operator.
7. Write a program to illustrate the use of unary prefix and postfix increment and decrement operators.
8. Write a program to input two numbers and display the maximum number.
9. Write a program to find the largest of three numbers using ternary operators.
10. Write a program to find the roots of quadratic equation.
11. Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored and the class of result.
12. Write a Program to Check Whether a Number is Prime or not.
13. Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.
14. Write a program to find the factorial of a number.
15. Write a program to check number is Armstrong or not.
    a. (Hint: A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself).
16. Write a program to check whether a number is Palindrome or not.
17. Write a program to generate Fibonacci series.
18. Write a program to find GCD (greatest common divisor or HCF) and LCM (least common multiple) of two numbers.
19. Write a Program to Search an element in array.
20. Write a Program to perform addition of all elements in Array.

21. Write a Program to find the largest and smallest element in Array.
22. Write a Program for deletion of an element from the specified location from Array.
23. Write a Program to access an element in 2-D Array.
24. Write a program for addition of two matrices of any order in C.
25. Write a Program to multiply two 3 X 3 Matrices.
26. Write a program to add, subtract, multiply and divide two integers using user-defined type function with return type.
27. Write a program to generate Fibonacci series using recursive function.
28. Write a program to find the sum of all the elements of an array using pointers.
29. Write a program to swap value of two variables using pointer.
30. Write a program to add two numbers using pointers.
31. Write a program to input and print array elements using pointer.
32. Write a program to create a structure named company which has name, address, phone and noOfEmployee as member variables. Read name of company, its address, phone and noOfEmployee. Finally display these members‟ value.
33. Write a program to read RollNo, Name, Address, Age & average-marks of 12 students in the BCT class and display the details from function.
34. Write a program to add two distances in feet and inches using structure

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS103N	DC	Computer System Organization	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To understand the basic model of a modern computer with its various processing units.
2. To impart knowledge on CPU and it's processing of programs.
3. To provide the information for hardware utilization methodology.
4. To impart knowledge of Multiprocessor and inter-process communication.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to:

1. Understand the architecture of a modern computer.
2. Explain the functional behavior of CPU and its other processing units.
3. Knowledge of the Peripherals of a Computer System.
4. Give the information to speed-up the working of Computer System.

Syllabus

UnitI **10HRS**

Computer Basics: Von Newman model, CPU, Memory, I/O, Bus, Memory registers, Program Counter, Accumulator, Instruction register, Micro-operations, Register Transfer Language, Instruction cycle, Instruction formats and addressing modes.

UnitII **9HRS**

Control Unit Organization: Hardwired control unit, Micro-programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming.

Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication, and division, Floating point, and decimal arithmetic.

Unit-III **8HRS**

Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, Data transferring approaches and modes.

Unit-IV **7HRS**

Memory organization: Memory Hierarchy, Cache Memory - Organization and types of cache mappings, Virtual memory, Memory Management Hardware.

Unit-V **8HRS**

Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

Text Books:

1. M. Morris Mano, Computer System Architecture, Fourth edition, Pearson Education, 2015.
2. William Stallings, Computer Organization and Architecture, Seventh Edition, PHI, 2009.
3. Andrew S. Tanenbaum, Structured Computer Organization, Sixth Edition, Pearson Education, 2016.
4. John P. Hayes, Computer Architecture and Organizations, Third edition, Mc-Graw Hills, New Delhi, 2017

References:

1. John L. Hennessy and David A. Patterson, Computer Architecture a quantitative approach, Fourth Edition, Elsevier, 2007.
2. Ramesh Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, fifth Edition, Prentice Hall, 2015.
3. Nicholas Carter, Computer Architecture (Schaum's), Third Edition, TMH, 2012.
4. Carl Hamacher, Computer Organization, Fifth Edition, TMH, 2002.

List of Experiments:

1. Study of peripherals, components of a Computer System.
2. Write a C program for sum of two binary numbers.
3. Write a C program for multiplication of two binary numbers.

4. Write a C program to implement Booth's algorithm for multiplication.
5. Write a C program to implement Restoring Division Algorithm.
6. Write the working of 8085 simulator GNUsim8085 and basic architecture of 8085 along with small introduction.
7. Study the complete instruction set of 8085 and write the instructions in the instruction set of 8085 along with examples.
8. Write an assembly language code in GNUsim8085 to implement data transfer instruction.
9. Write an assembly language code in GNUsim8085 to store numbers in reverse order in memory location.
10. Write an assembly language code in GNUsim8085 to add two 8 bit numbers stored in memory and also storing the carry.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain-IBM)

Choice Based Credit System (CBCS) 2021-25

SEMESTER I

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIBM105N	DC	Software Foundation and Programming (1. Clean Coding; 2. Javascript; 3. NodeRed; 4. NodeJS)	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
*__Teacher Assessment__ shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. Elevate your professionalism and increase your code quality
2. Foundation for a professional development career
3. Provide students a clear vocabulary for evaluating code quality.
4. Understanding the basic ideas of programming
5. Implementation of java script codes
6. Implementation of node.js codes
7. Learn the language of web: HTML and CSS

Course Outcomes:

1. Understand about the clean code.
2. Explain the importance of naming conventions.
3. Understand the importance of comments in the applications.
4. Understand the purpose of formatting and objects.
5. Describe JavaScript primitives and objects
6. Explain how variables are declared and used in JavaScript
7. Describe JavaScript control structures
8. Describe functions in JavaScript
9. Describe the document object model (DOM) hierarchy
10. Describe the window and document objects
11. Understand the Node.js framework
12. Work with Node Projects
13. Master Express.js
14. Installing NodeJS and Nodeclipse Plugin

15. Understand basic routing in Node.js
16. Understand file systems in Node.js
17. Serving static content in Node.js
18. Learn how Express.js connects with MongoDB
19. Perform CRUD operations using NodeJS and MongoD
20. Identify the DOM objects that are commonly used in JavaScript applications for working With HTML documents

Syllabus:

UNIT I

Introduction to Clean Coding

Understand the importance of bad and good code.
Understand the importance of meaningful distinct names.
Usage of domain and function names
Usage of exceptions and its error code names/descriptions.
Understand about clean and bad comments.
Understand the process of vertical and horizontal formatting.

Introduction to Web-designing

Html basic commands, Webpage creation using tags like formatting tags, table, frame and form tags. CSS types and properties with examples.

UNIT II

Objects

Learn about data abstraction.
Understand the data and object antisymmetric.

Javascript Basics

Nature of JavaScript language
Understand JavaScript primitive types.

Javascript objects

Understand Java Script Array Objects
Understand Java Script Date Objects
Understand Java Script Error Objects

UNIT III

Javascript variables and Control statements

Understand how to define JavaScript Variables
Work Java Script If statements

Work Java Script switch statements Work
JavaScript for and while loop statements

Javascript Functions

Declare a JavaScript function
Creating custom objects with functions
Adding functions to prototypes
Self-executing functions

UNIT IV

Client side Javascript

Understand Scripts in HTML documents
Describe the document object model (DOM) hierarchy
Overview of the DOM specification levels
Describe the window and document objects
Accessing document elements
Common API in web and XML scripting

Node JS Introduction

Understand NodeJS and its features
Understand Express Framework.
Understand Key features of MongoDB

UNIT V

Installation and Configuration

Install NodeJS on command line
Hands on: Create sample NodeJS + Express project using command line
Install Node eclipse plugin
Hands-on: Create sample NodeJS + Express project using Eclipse

File System

Understand__dirname and filename
Understand synchronous vs Asynchronous file read
Understand View Templates
How to serve static content in NodeJS
Connecting to the database using NodeJS

Install and Setup MongoDB

NodeJS Mongo Driver
Perform CRUD Operation

Understand Connection Pooling using NodeJS and Mongo Driver
Hands on Develop Web Application using Node JS and Mongo DB

Text Books:

1. Mastering HTML, CSS & Javascript Web Publishing by Lemay Laura, BPB Publications, ISBN: 9788183335157, 9788183335157
2. Javascript by Flanagan David, Packt publishers, ISBN: 9789350237311, 9789350237311
3. Web technologies-black book by Dreamtech Press publications, ISBN-13 : 978-9351199076, ISBN-10 : 935119907X

Reference Books:

1. Java script by example by Dani Akash Dani Akash S, Kindle Edition
2. Java script: the good parts by D Crockford, Kindle Edition
3. IBM Study Materials

List of Experiments:

1.Designing a table containing the properties like cellpadding, cellspacing, rowspan, colspan, border etc.

2.Differentiate between frame and div tag with examples.

3.Biodata form creation

4. Implementation of different types of css with properties.

5. Use of javascript with html and css.

6. Program to implement javascript conditional statements.

7. Program to implement javascript switch case.

8.Javascript all types of loop creation.

9. Javascript array creation.

10. Program to implement javascript functions.

11. Program to implement javascript events.

12. Program to implement javascript objects.

13. Basic node.js code creation.

14. Example of MongoDB with node.js.