| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| | | | THEORY | | | PRACTICAL | | | | | |
| | | | 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):

1. The student will have ability to:
2. To introduce the students with the Fundamentals of the Differential, Integral, Vector Calculus and NumericalAnalysis.

## 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                                                                                          10HRS
**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

## B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain/ Internet of Things-IBM)
### Choice Based Credit System (CBCS)-2023-27
### SEMESTER-I

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| | | | THEORY | | | PRACTICAL | | | | | |
| | | | 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.

integrals. Application to length, area, volume, surface area of revolution. Multiple integrals with application to volume, surface area, Change of variables.

**UNIT II**I                                                                                          **8HRS**
   **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**                                                                                          **7HRS**
   **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**                                                                                          **8HRS**
   **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).

**B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Blockchain/ Internet of Things-IBM)**
**Choice Based Credit System (CBCS)-2023-27**
**SEMESTER-I**

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| | | | 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.

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

**References:-**
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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| Vishwavidyalaya,Indore | Vishwavidyalaya,Indore | | |

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| **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. comprehend laws of physics.
2. apply laws of physics for various engineering applications.
3. determine physical parameter experimentally and will be able to analyze the data obtained experimentally to draw substantiate conclusions.

### Syllabus:
### UNIT I                                                                                                           10HRS

**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                                                                                                          9HRS

**Solid State Physics:** Free electron model, Qualitative Analysis of Kronig Penney Model, Effective 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

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| **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;
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**UNIT III**                                                                                         8HRS

**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**                                                                                          7HRS

**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**                                                                                           8HRS

**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.

**TEXTBOOKS:-**

1. Engineering Physics by Dr. S. L. Gupta and Sanjeev Gupta, DhanpatRai Publication,
   NewDelhi.
2. Engineering Physics by Navneet Gupta, DhanpatRai Publication, NewDelhi.
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.

**REFERENCES:-**

1. Concepts of Modern Physics by Beiser, TMH, NewDelhi.
2. Solid State Physics by Kittel,WileyIndia.
3. Atomic and Nuclear physics by Brijlal andSubraminiyan.

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| **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.

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

# PRACTICAL LIST:-

1. Measurement of radius of curvature "R" of convex lens by Newton"s ringexperiment.
2. Measurement of Numerical aperture of fiber byLASER.
3. Determination of Energy band gap „$E_g$" of Ge using Four Probemethod.
4. Measurement of Frequency of A.C. mains by electrically maintained vibratingrod.
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-Ndiode.
12. To study characteristics of Photodiode.
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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| HUCS101 | BS | **Communication Skills** | 60 | 20 | 20 | 0 | 50 | 1 | 0 | 2 | 2 |

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### Course Educational Objectives (CEOs):

1. Develop the second language learners 'ability to enhance and demonstrate LSRW Skills.
2. Enable students to acquire English Language Skills to further their studies at advanced levels.
3. Prepare students to become more confident and active participants in all aspects of their under graduate programs

### 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. Enhance confidence in their ability to read, comprehend, organize, and retain written in formation.
2. Write grammatically correct sentences for various forms of written communication to express oneself.

### Syllabus:

**UNIT I**                                                                                                           **10HRS**
   Communication: Nature, Meaning, Definition, Verbal and Non Verbal Communication
   Barriers to Communication.

**UNIT II**                                                                                                           **9HRS**
   Basic Language Skills: Grammar and usage- Parts of Speech, Tenses, S-V Agreement,
   Preposition, Article.

**UNIT III**                                                                                                           **8HRS**
   Basic Language Skills: Types of Sentence, Direct - Indirect, Active - Passive voice, Phrases&
   Clauses.

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| | | | THEORY | | | PRACTICAL | | | | | |
| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| HUCS101 | BS | Communication Skills | 60 | 20 | 20 | 0 | 50 | 1 | 0 | 2 | 2 |

**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.

**UNIT IV**                                                                                          **7HRS**
   **Business Correspondence:** Business Letter, Parts & Layouts of Business Resume and Job application, E-mail writing.

**UNIT V**                                                                                           **8HRS**
   Report Writing: Importance of Report, Types of Report, Structure of a Report.

**List of Practical's:**
   1. Self Introduction
   2. Reading Skills and Listening Skills
   3. Oral Presentation
   4. Linguistics and Phonetics
   5. JAM (Just a Minute)
   6. Group Discussion

**Suggested Readings:**
   1. Ashraf Rizvi.(200**5**).Effective Technical Communication. NewDelhi: Tata McGrawHill
   2. Adair, John (2003). Effective Communication. London: Pan Macmillan Ltd.
   3. A.J.ThomsonandA.V.Martinet(1991).APracticalEnglishGrammar(4thed).Newyork:Ox-Ford IBH Pub.
   4. Kratz, Abby Robinson (1995). Effective Listening Skills. Toronto: ON: Irwin Professional Publishing.
   5. Prasad, H. M.(2001) How to Prepare for Group Discussion and Interview. New Delhi: Tata McGraw-Hill.
   6. Pease, Allan. (1998).Body Language. Delhi: Sudha Publications.

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
| | | | THEORY | | | PRACTICAL | | | | | |
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| BTCS 101M | BEC | Introduction to Computer Science and Engineering | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 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. Understanding the basic concepts and features of various kinds of Operating systems.
3. Learning the Concepts of Office Automation Tools.
4. To provide knowledge of Networking, Internet, Communication and security.

**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.
4. Understand Networking, Internet, Communication and Security.

**Syllabus:**

**Unit-I**                                                                                             **8HRS**
Introduction: Introduction to Computers, Hardware and Software, Classification and History of Computers, Functions of the different Units, Applications of Computers, Representation of data and information, Machine language, Assembly Language, High level Language, Number System and Conversion.

**Unit-II**                                                                                             **6HRS**
Introduction to Operating System: Definitionof Operating System,Types and Functions of Operating Systems, Free and Open-Source Software.
Introduction to Database Management System: Introduction, File Oriented Approach and Database, importance and applications of DBMS.

## Shri Vaishnav Vidyapeeth Vishwavidyalaya
## Shri Vaishnav Institute Of Information Technology
## B.Tech (CSE with specialization in Enterprise System in association with RedHat)
## Choice Based Credit System (CBCS)-2023-27
## SEMESTER-I

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| | | | THEORY | | | PRACTICAL | | | | | |
| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BTCS 101M | BEC | Introduction to Computer Science and Engineering | 60 | 20 | 20 | 0 | 0 | 3 | 0 | 0 | 3 |

**Legends**: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical;   **C** - Credit;
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**Unit-III**                                                                                               **8HRS**
Introduction to Computer Network: Introduction, importance of Computer Network, LAN, MAN, WAN, Networking Devices, World Wide Web, Web Browser, viruses, worms, malware, Use of Antivirus software, Good Computer Security Habits.

**Unit-IV**                                                                                               **8HRS**
Introduction to HTML: HTML Documents, SGML, Basic structure of an HTML document, Text Elements, Tag Elements, Special Character elements, Image tags, HTML Table tags and lists, Anchor tag, Name tag, Hyperlinks‐FTP/HTTP/HTTPS, Static and Dynamic Web Pages.

**Unit-V**                                                                                               **6HRS**
Office Automation Tools: Introduction to Microsoft Word, Elements of word Processing and Working Objectives, MSWord Screen and its Components,Features of word, Introduction to MS-Excel, MS-Excel Screen and Its Components, Features of Excel, Manipulation of cells, Formatting of Spreadsheet and Cells, Formulas and Functions, Introduction to MS-PowerPoint,MS-PowerPoint Screen and Its Components, Features of PowerPoint, Working with MS-PowerPoint, Preparation of Slides, Creation of Presentation, Slide Manipulation and Slide Show, Presentation of the Slides.

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| BTCS103M | DCC | Computer System Organization | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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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):

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.

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| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BTCS103M | DCC | Computer System Organization | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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**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.

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| BTCS103M | DCC | Computer System Organization | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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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.

**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.

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| **BTCS107M** | **SEC** | **Program Development using C** | **0** | **0** | **0** | **30** | **20** | **0** | **0** | **2** | **1** |

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## Course Educational Objectives (CEOs):

The student will have ability to:
1. Identify situations where computational methods and computers would be useful.
2. Given a computational problem, identify and abstractthe 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.

## Syllabus:
**UNIT I** **Introduction to Programming Languages:** Evolution of Programming   **7HRS** Languages, Structured Programming, The Compilation Process, Object Code, Source Code, Executable Code, Operating Systems, Interpreters, Linkers, Loaders, Fundamentals Of Algorithms, Flowcharts.

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**UNIT II**   **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.   **10HRS**

**UNIT III**   **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.   **8HRS**

**UNIT IV**   **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   **7HRS**

**UNIT V**   **Structure:** Structure Variables, Initialization, Structure Assignment, Structures and Arrays: Arrays of Structures.   **8HRS**

**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.

**References:**
1. Herbert Schildt "C: Complete Reference", Tata McGraw Hill 2000.
2. Yashwant Kanetkar, "Let us C", BPB Publication, 16th Edition 2018.

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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.

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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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## Shri Vaishnav Institute Of Information Technology
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### Choice Based Credit System (CBCS)-2023-27
### SEMESTER-I

| COURSE CODE | CATEGORY | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | L | T | P | CREDITS |
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| BTIBM105N | DCC | Software Foundation and Programming ( 1.Clean Coding; 2.Javascript; 3.NodeRed; 4. NodeJS) | 0 | 0 | 0 | 30 | 20 | 0 | 0 | 2 | 1 |

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## Course Educational Objectives (CEOs):

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 (COs):

As a result of attending this course:

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.

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17. Serving static content in Node.js
18. Learn how Express.js connects with MongoDB.
19. Perform CRUD operations using NodeJS and MongoDB.
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, frameand form tags. CSS types and properties with examples.

**UNIT II**
**Objects**

Learn about data abstraction.

Understand the data and object antisymmetric.

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### Javascript Basics

Nature of JavaScript
language Understand
JavaScript primitive types.

### Javascript objects

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

## UNIT III

### Javascript variables and Control statements

Understand how to define
JavaScript VariablesWork Java
Script If statements

Work Java Script switch
statements WorkJavaScript
for and while loop statements

### Javascript Functions

Declare a JavaScript function

Creating custom objects
with functionsAdding
functions to prototypes

Self-executing functions

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## UNIT IV

### Client side Javascript

Understand Scripts in HTML documents

Describe the document object model (DOM) hierarchyOverview of the DOM specification levels

Describe the window and document objectsAccessing document elements

Common API in web and XML scripting

### Node JS Introduction

Understand NodeJS and its featuresUnderstand 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 lineInstall Node eclipse plugin

Hands-on:  Create sample NodeJS + Express project using Eclipse

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### 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, BPBPublications, 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

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**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.

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