# Shri Vaishnav Vidyapeeth Vishwavidyalaya

## B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/DS/FSDB-IBM)

### Choice Based Credit System (CBCS) 2020-21

## SEMESTER II

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **THEORY** | | | **PRACTICAL** | |
| BTMACS201 | UG | Mathematics-II | 3 | 1 | 0 | 4 | 60 | 20 | 20 | 0 | 0 |

**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:**
The student will have ability to:

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

**Course Outcomes:**
After the successful completion of this course students will be able to
1. Understand and apply the basics of the calculus of matrices.
2. Solve the fundamental problems of the ordinary differential equations.
3. Apply the advanced techniques to find the solution of the ordinary differential equations.
4. Know the techniques of the numerical analysis.
5. Find the numerical solution of the ODE.
6. Understand and apply the basics of the statistical methods.

**Syllabus:**

**UNIT I**
**Calculus of Matrices:** Systems of linear equations and their solutions. Matrices, determinants, rank and inverse. Linear transformations. Range space and rank, null space and nullity. Eigenvalues and eigenvectors. Similarity transformations. Diagonalization of Hermitian matrices.

**UNIT II**
**Differential Equation:** Ordinary Differential Equations: First order linear and nonlinear ordinary differential equations, exactness and integrating factors. Ordinary linear differential equations of n-th order, solutions of homogeneous and non-homogeneous equations. Operator method. Method of undetermined coefficients and variation of parameters.

**UNIT III**
**Numerical Analysis Interpolation and Curve Fitting:** Introduction to Interpolation; Calculus of Finite Differences; Finite Difference and Divided Difference Tables; Newton-Gregory Polynomial Form; Lagrange Polynomial Interpolation; Approximation by Least Square Method.
**Numerical Differentiation and Integration:** Discrete Approximation of Derivatives: Forward and Backward Difference Forms, Numerical Integration, Simple Newton-Cotes Rules:

Trapezoidal and Simpson's (1/3) Rules; Weddle's Rule.

## UNIT IV

**Numerical Solution of ODE:** Euler's Method for Numerical Solution of ODE; Modified Euler's Method; Runge-Kutta Method (RK2, RK4); Multistep Method: Predictor-Corrector method.

## UNIT V

**Probability Theory and Random Process :**Axiomatic construction of the theory of probability, independence, conditional probability, and basic formulae, random variables, binomial, Poisson and normal random variable, probability distributions, functions of random variables; mathematical expectations, Definition and classification of random processes, discrete-time Markov chains.

**Text Books:**
1. G. Strang, Linear Algebra And Its Applications, 4th Edition, Brooks/Cole, 2006
2. S. L. Ross, Differential Equations, 3rd Edition, Wiley, 1984.
3. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall, 1995.
4. W.E. Boyce and R.C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 7th Edition, Wiley, 2001.
5. K. E. Atkinson, Numerical Analysis, John Wiley, Low Price Edition (2004).
6. S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw-Hill,2005.
7. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi

**Reference Books:**
1. E. Kreyszig, Advanced Engineering Mathematics, 9th Edition, Wiley, 2005.
2. R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 5th Ed, Wiley, 1999.
3. J. Stewart, Calculus: Early Transcendentals, 5th Ed, Thomas Learning (Brooks/ Cole), Indian Reprint, 2003.
4. J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 2nd Edition, Texts in Applied Mathematics, Vol. 12, Springer Verlag, 2002.
5. J. D. Hoffman, Numerical Methods for Engineers and Scientists, McGraw-Hill, 2001.
6. 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.
7. S. C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, McGraw-Hill 2008.

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | TEACHING & EVALUATION SCHEME | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | THEORY | | | PRACTICAL | |
| | | | | | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* |
| BTCS204 | UG | Computer Peripherals and Interfaces | 3 | 1 | 2 | 5 | 60 | 20 | 20 | 30 | 20 |

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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 Objectives:**
1. To learn the concept of memory modules and types along with advanced memory.
2. To learn the input/output components presents on the motherboard.
3. To learn different modes of power supply to the PC and it's troubleshooting.
4. To learn different types of interfaces and ports of PC board.
5. To learn the device drivers and peripherals attached to the PC board.

**Course Outcomes:**
Upon completion of the course, students will be able:
1. To understand the hierarchy of the Memory used for PC and its applications.
2. To understand the use and working of I/O components.
3. To understand the principles behind the power supply and its usage.
4. To understand the onboard and external interfaces and its utility on PC board.
5. To understand the use and requirement of peripherals and their device drivers.

**Syllabus:**

**UNIT I**
**Memory:** Introduction to memory and its use, Memory chips and Modules: DIPP, SIPP, SIMM, DIMM, SO-DIMM, RIMM, Parity checking and ECC, ROM and its types, RAM and its types, Trouble shooting of Memory, Advanced Memory technologies: RDRAM, DDRAM, PRAM, VRAM.

**UNIT II**
**Motherboard:** Motherboard Controllers and System Resources, I/O System Bus: ISA, MCA, ELSA, VESA local bus, PCI, AGP, PCIX, Onboard I/O devices, Chipsets, ROM BIOS, ROM POST, CMOS settings, Motherboard Form factor: AT and ATX Motherboard, LPX and NLX form factor.

**UNIT III**
**Power Supply:** Power Supply Functions and Operations, Power Supply Quality and Specifications, Power Supply and Form factors, Ventilation and Cooling: Fan, Processor cooling, Temperature limits, Power Problems and procedures, Power protection devices, Back-up power

system.

## UNIT IV
**Interfaces and I/O Ports:** Floppy Disk interface: Controller, Power cable, Control/Data cable, IDE interfaces: ATA standards, Master/Slave Configuration, Data transfer modes, SCSI interface: Bus, Standards, Hardware's, which is better SCSI or IDE, Serial ports, Parallel ports, USB, Troubleshooting.

## UNIT V
**Device Drives and Peripherals:** Magnetic Storage: Reading/Writing, hard disk drives, Floppy disk drives, Optical Storage devices: CD-ROM drive, DVD-ROM drive, Keyboard: layouts, interfaces, Pointing devices, Mouse, Monitors, Printers, Troubleshooting of device drivers and peripherals.

**Text Books:**
1. Craig Zacker& John Rourtre, PC Hardware- The complete reference,First Edition, TMH, 2017
2. S.K. Chauhan, PC Upgrading, maintenance and troubleshooting guide, First Edition,.
3. B. Govindarajalu, IBM PC and CLONES: Hardware, Troubleshooting and Maintenance McGraw Hill Education, 2nd Edition 2002
4. Mark Minasi, The Complete PC Upgrade and Maintenance Guide, Sixteenth edition Wiley, 2005
5. Mike Meyers, Introduction to PC Hardware and Troubleshooting, 1st edition, McGraw Hill Education, 2017

**Reference Books:**
1. Stephen Bigelow, Bigelow's Troubleshooting, Maintaining & Repairing PCs, 5 edition, McGraw Hill Education, 2017
2. Manahar Lotia, Pradeep Nair, Payal Lotia, Modern Computer Hardware Course, Second Revised Edition, BPB Publications, 2007
3. Vikas Gupta, Comdex Hardware and Networking Course Kit: Revised & Upgraded, Dreamtech Press, 2014
4. Dan Gookin, Troubleshooting and Maintaining Your PC All–in–One For Dummies, 3rd edition, John Wiley & Sons, 2017
5. Robert Bruce Thompson, Barbara Fritchman Thompson, Building the Perfect PC, 3 edition, O′Reilly, 2010

**List of Practical:**
1. To study and demonstrate the motherboard.
2. To study microprocessor and its types.
3. To study Back Power Supply: SMPS and UPS.
4. To study the Optical Drives: CD-ROM and DVD-ROM.
5. To study the working principle of keyboard and mouse.
6. To study different types ports and slots on board.
7. To study various types of Cables and their Connectors.

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8.  To study the working principle of monitor.
9.  To study different types of printers.
10. To study the process of assembling a Motherboard.
11. To study working of Floppy Disk Drive.

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### Choice Based Credit System (CBCS) 2020-21
## SEMESTER II

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | THEORY END SEM University Exam | THEORY Two Term Exam | THEORY Teachers Assessment* | PRACTICAL END SEM University Exam | PRACTICAL Teachers Assessment* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BTIBM203 | UG | Design Thinking | 3 | 1 | 2 | 5 | 60 | 20 | 20 | 30 | 20 |

**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:
The student will have ability to:
1. To learn the concepts of Business Process Manager.
2. To emphasizing the concepts of reuse, ease of maintenance, and high-quality development strategies .
3. To create a simple case and a business process definition (BPD) from business requirements.

## Course Outcomes:
Upon completion of the subject, students will be able to:
1. Define business process management (BPM).
2. List and describe the phases in the BPM lifecycle Procedure.
3. Define process modeling
4. Create a process application
5. Describe IBM Business Process Manager product components
6. Understand what came before Design Thinking
7. See how design thinking is introduced in an organization
8. Learn how it built upon previous approaches
9. Get an overview of the whole approach to design thinking
10. Understand the principles, loop, and keys

## Syllabus:

### UNIT–I
**INTRODUCTION TO BUSINESS PROCESS MANAGEMENT &AS-IS BUSINESS PROCESS** Define business process management (BPM), List and describe the phases in the BPM lifecycle procedure, Define process modeling., Describe how to use IBM Business Process Manager to accomplish process modeling goals, Explain how to create and modify process applications in the Process Center, Create a process application, Explain case management, Describe the purpose and function of Blue works Live, List and describe the core notation elements that are used in  IBM Process Designer, Create a business process definition (BPD) from the process and nested process tasks and responsible, Explain how to create and modify process models with the Designer view of the IBM Process Designer.

## UNIT–II
## PLAYBACK 0: MODELING PROCESS

List and describe gateways as they are used in IBM Process Designer, List and describe intermediate event types that are used in IBM Process Designer, Model a business process escalation path with an attached timer intermediate event, Describe the Playback 0 validation goals and requirements, Validate that a process model meets Playback 0 goals and Requirements, Describe IBM Business Process Manager product components, Identify the integrations with other IBM products.

## UNIT–III
## ENTERPRISE DESIGN THINKING – HISTORY, OVERVIEW

Understand what came before Design Thinking, Identify who did what to bring it about, Learn how it built upon previous approaches, Get an overview of the whole approach to design thinking, Understand the principles, loop, and keys, Determine what is most important.

## UNIT–IV
## ENTERPRISE DESIGN THINKING –7 KEY HABITS, THE LOOP, USER RESEARCH

Learn 7 key habits of effective thinkers design, Avoid common anti-patterns, Optimize for success with these habits, Understand the importance of iteration, Learn how to observe, reflect, & make, Get ready to drill down & do tomorrow, Understand the importance of user research, Appreciate empathy through listening, Learn key methods of user research.

## UNIT–V
## ENTERPRISE DESIGN THINKING – MAKE, USER FEEDBACK:-

Understand how Make fits into the Loop ,Learn how to leverage Observe information, Learn Ideation, Storyboarding, & Prototyping, Understand user feedback and the Loop, Learn the different types of user feedback, Learn how to carry out getting feedback.

**Text Books:**

1. IBM COURSEWARE – SKILLS ACADEMY

**Reference Books:**

**1**. IBM COURSEWARE – SKILLS ACADEMY

**List of Practical:**

1. CREATING YOUR FIRST DISCOVERY MAP IN BLUEWORKS LIVE Study of Process Life Cycle.
2. CREATING PROCESS MODEL IN BLUEWORKS LIVE.

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## SEMESTER II

3. ADDING AND VIEWING PROCESS DETAILS IN BLUEWORKS LIVE
4. ENTERPRISE DESIGN THINKING - LISTENING.
5. ENTERPRISE DESIGN THINKING - HMW
6. ENTERPRISE DESIGN THINKING - USER RESEARCH
7. ENTERPRISE DESIGN THINKING – REFLECT
8. ENTERPRISE DESIGN THINKING – IDEATION
9. ENTERPRISE DESIGN THINKING – STORYBOARDING
10. ENTERPRISE DESIGN THINKING - CRAFTING HILLS
11. ENTERPRISE DESIGN THINKING - PROTOTYPING

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| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | TEACHING & EVALUATION SCHEME | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | THEORY | | | PRACTICAL | |
| | | | | | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* |
| **BTCS404** | **UG** | **Computer System Organization** | 3 | 1 | 0 | 4 | 60 | 20 | 20 | 0 | 0 |

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**Course Objective:**
1. Understand the architecture of a modern computer with its various processing units.
2. To impart knowledge on processor speed and processing of programs.
3. The performance measurement of the computer system.
4. To introduce hardware utilization methodology.
5. To impart knowledge in inter process communication.

**Course Outcomes:**
After the course completion student will be able to
1. Understand the architecture of modern computer.
2. Analyze the Performance of a computer using performance equation.
3. Understanding of different instruction types.
4. Understand how computer stores positive and negative numbers.

**Syllabus:**

**UNIT 1**
**Introduction for basic model of computer**: Brief History of computers, Von Newman architecture, Computer components, CPU, Memory, I/O, System Bus, registers, Program Counter, Accumulator, Register Transfer Language, Instruction Cycle, Instruction formats and addressing modes of basic computer. Basic arithmetic operations: addition, subtraction, multiplication, division, floating point arithmetic.

**UNIT II**
**Control Unit Organization:** Control unit operations - Address Sequencing & Micro operations, Hardwired control unit, Micro and Nano programmed control unit, Control Memory, Micro Instruction formats, Micro program sequencer, Microprogramming.

**UNIT III**
**Input Output Organization:** I/O Systems, Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, I/O processor, Introduction to 8085, 8085 I/O structure, 8085 instruction set and basic programming.

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## SEMESTER II

**UNIT IV**

**Memory organization:** Characteristics of Memory systems, Internal and External memories, Memory Hierarchy, High speed Memories: Cache Memory - Organization and mappings, Associative memory, Virtual memory: Segmentation, Paging, Address Translation Virtual to Physical. Secondary Storage: Magnetic Disk, Tape, DAT, RAID, Optical memory, CDROM, DVD.

**UNIT V**

**Multiprocessors:** Multiprocessor organization, Instruction level pipelining and Superscalar Processors , Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication, GPU.

**Text Books:**
1. Morris Mano, Computer System Architecture, Fourth edition, PHI, 2015.
2. Tanenbaum, Structured Computer Organization, First Edition, Pearson Education, 2016.
3. J P Hayes, Computer Architecture and Organizations, Third edition, Mc- Graw Hills, New Delhi, 2017

**Reference Books:**
1. Gaonkar, Microprocessor Architecture, Programming, Applications with 8085, fifth Edition, Prentice Hall, 2015.
2. William Stallings, Computer Organization and Architecture, Seventh Edition, PHI, 2009.
3. ISRD group, Computer Organization, Second edition, TMH, 2006.
4. Carter, Computer Architecture (Schaum), Third Edition, TMH, 2012.
5. Carl Hamacher, Computer Organization, Fifth Edition, TMH, 2002.

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### Choice Based Credit System (CBCS) 2020-21
## SEMESTER II

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | THEORY | | | PRACTICAL | |
| | | | | | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BTIBM202 | UG | Agile Development Methodologies (DevOps + Agile) | 2 | 0 | 2 | 3 | 60 | 20 | 20 | 30 | 20 |

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## COURSE OBJECTIVES
The student will have ability to:
1. This course makes student learn the fundamental principles and practices associated with each of the agile development methods.
2. To apply the principles and practices of agile software development on a project of interest and relevance to the student.
3. To understand the key Concepts of Agile Development, Agile Project Delivery and Agile Project Management.
4. To understand the difference between Agile and Traditional Project Delivery.
5. To Understand Key Methodologies including scrum and Kanban.

## COURSE OUTCOMES
Upon completion of the subject, students will be able to:
1. Analyzing the philosophy and principles of Agile.
2. Understanding the life cycle of a project, including alternative configurations and other project management models.
3. Analyzing the roles and responsibilities within agile projects.
4. Understanding how the Agile Project Management process can enable planning, management and control for predictable agile project deliveries.
5. Implementing the software projects in a continuous and faster way.
6. Executing the various tools used in DevOps and applying them in project development.

## SYLLABUS

### UNIT–I
### DevOps Fundamentals, Git, Maven, Docker: -
What is a Project: Project Definition, Project vs Operations,Project, Program and Portfolio Relationship,Project Features,Project Phases, Project Execution Methodologies: Waterfall Model,V-Model,Agile,Agile vs Waterfall. Agile Deep Dive: Agile Methodology Overview, Agile Manifesto Introduction and Guiding Principles, Agile Team Roles, Agile Frameworks. DevOps Fundamentals: Introduction to DevOps, Introduction to Continuous

Integration/Continuous Delivery/Continuous Deployment, DevOps Tools-Git, Maven, Docker: Git, Maven, Docker.

**UNIT–II**

**Scrum framework, Scrum Artifacts: -**Scrum: Scrum Foundation, Scrum Team, Roles of Scrum Team, Sprints. Scrum Artifacts: Product Backlog, Sprit Backlog,Sprint Burndown chart, Impediment List,Product Increment.

**UNIT–III**

**Sprint Planning, Scrum Meetings, PBR, Sprint Goal, User Stories, Definition of Done, Team Velocity, Defect Density, Scrum Scaling, Scrum Practices, Scrum Vs Kanban, Xtreme Programming, Xtreme Programming vs Scrum: -**Scrum Ceremonies: Sprint Planning, Daily Scrum Meeting, PBR, Sprint Review. Scrum Sprint Planning: Sprint Goal,User Stories, Estimate User Stories, Definition of Done. Scrum Metrics: Sprint Goal Success, Team Velocity, Sprint Burn Down Charts, Defect Density, Scrum Scaling, Distributed Scrum Practices, Agile Environments and tools, Scrum vs Kanban, Xtreme Programming vs Scrum.

**UNIT–IV**

**Puppet, Jenkins, Junit, Nagios, Introduction of a Use case for CI/CD Pipeline, Problem Solving with DevOps: -**More on DevOps Tools: Puppet, Jenkins, Junit, Nagios. DevOps Use-case: Introduction of a Use-case for CI/CD Pipeline, Problem Solving with DevOps.

**UNIT–V**

**Advanced DevOps Concepts, Automatic Rollback, Automatic Provisioning, what is Cloud, IBM Cloud, DevOps using IBM Cloud: -**Advanced DevOps Concepts: Automatic Rollback, Automatic Provisioning. Introduction to DevOps on IBM Cloud: What is Cloud, IBM Cloud, DevOps Using IBM Cloud.

**TEXTBOOKS:**

1. Eric Ries, The Lean Startup, Publisher: Current, 1st edition, September 13, 2011
2. Roman Pichler, Agile Product Management with Scrum, Publisher: Addison Wesley, 1 st edition, 22 March 2010
3. Robert C. Martin, Clean Code: A Handbook of Agile Software Craftsmanship. Publisher : PHI; First edition , 25 September 2017
4. Anju Singhal, Jai Singhal, Book: Scrum Guide, Publisher: Agiliants Inc, First edition, 13 August 2013
5. Robert C. Martin, Agile Software Development, Principles, Patterns and Practices, Publisher: PHI; Subsequent edition 15 October 2002

**REFERENCES:**

1. IBM Softcopy(ppt,pdf,docx)
2. http://www.katacoda.com
3. https://www.edureka.co/blog/docker-commands/mirantis.com/tag/docker
4. https://www.scalyr.com/blog/create-docker-image/

5. https://www.howtoforge.com/tutorial/how-to-create-docker-images-with-dockerfile/

**LIST OF EXPERIMENTS:**
**Installation of GIT and Creating GIT Repository.**
1. By which method we can supply a commit message to a commit? Describe in brief.
2. Write the way to check state of local git repository since last commit.
3. Give the command to initialize a new git repository.
4. Write the command that removes the target directory with all the build data before starting the build process.
5. Create a As-is scenario Map taking any example you like.
6. Creating a Maven Project.
7. Installation and setting up puppet.
8. Installing Docker and Creating Docker Image.
9. Process all docker commands.
10. Setting up DevOps on IBM Cloud.
11. For Designing a better way for cab booking from start to finish. Create a List of Stake holders, Empathy Map and As-is Scenario Map
12. Create a 2-3 Sprint with entire team.
13. Create a To-be Scenario for any organization.
14. Discuss the empathy Map in design thinking.

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| **BTCS208** | **UG** | **Programming Skills with 'C++'** | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 30 | 20 |

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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 Objectives:
1. To explain abstract data types, classes and different types of objects.
2. To distinguish among types of relationships between classes and express the associations diagrammatically.
3. To analyze the public, protected and private modes of inheriting the classes.
4. To demonstrate the overloading of functions and operators to grant them a different meaning.
5. To formulate programs using the concepts of object oriented programming languages.

## Course Outcomes:
Upon the completion of the course, students will be able to:
1. Identify and describe the components of object-oriented technology and justify their relevance.
2. Classify and model the relationships/associations that exist between classes and objects.
3. Perform experiments on inheritance by implementing code reusability and polymorphism by overloading the functions as well as operators.
4. Develop programs for real world scenarios using the object oriented approach.

## Syllabus:

### UNIT I:
### Object Oriented Programming:
Concept of Object Oriented Programming - Data hiding, Data encapsulation, Class and Object, Abstract class and Concrete class, Polymorphism (Implementation of polymorphism using Function overloading an example in C++); Inheritance, Advantages of Object Oriented Programming over earlier programming methodologies.

### UNIT II:
**Tokens, Expression and controls Structures:** Tokens , Keywords, Identifiers and Constants, C++ data types,Variables: Declaration, Dynamic initialization of variables, Reference variables. Operators in C++ : Scope resolution operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type cast operators, Expressions and Control Structures.

Functions: The main() function, Function Prototyping, Call by reference, Return by reference, Inline function, Function Overloading.

## UNIT III:

**Class and Object:** Introduction, Specifying a Class, Defining Member Functions, C++ Program with Class, Nesting of Member functions, Private Member Functions, Memory Allocation for Objects, Static Data members, Static Member Functions, Arrays within a Class, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects.

**Constructor and Destructor**: Constructor: Special Characteristics, Declaration and Definition of a constructor, Default Constructor, Overloaded Constructors, Copy Constructor, and Constructor with default arguments;

**Destructor:** Special Characteristics, Declaration and definition of destructor, Operator overloading: Defining Operator Overloading, Overloading Unary Operators, and Overloading Binary Operators.

## UNIT IV:

**Inheritance and Polymorphisms:** Introduction, Defining Derived Classes, Single inheritance, Multiple inheritance, Hierarchical inheritance, Multilevel inheritance, Hybrid inheritance, Virtual Base Classes, Polymorphism, static and dynamic binding, Constructor in Derived Classes, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

## UNIT V:

**I/O Operations and Files:** C++ Stream Classes, Unformatted I/O Operations, Formatted I/O operations, Classes for File Streams, Opening and Closing a File: open() and close() functions, Manipulators of File Pointers : seekg(), seekp(),tellg(), tellp() functions, Sequential Input and output Operations : put (), get(), write(), read() functions,Error handling File Operations : eof(), fail(), bad(), good().

**Text Books:**
1. E Balagurusamy, Object Oriented Programming with C++, 7Th Edition, Mc Graw Hill India, 2017.
2. Robert Lafore, Object Oriented Programming In C++, 4Th Edition, 2001.
3. David Parsons, Object Oriented Programming with C++; BPB publication, 2008.
4. Hubbard, Programming in C++ (Schaum), 3rd Edition, McGraw Hill Education, 2009.

**Reference Books:**
1. Herbert Schildt, The Complete Reference, 4th Edition, Tata McGraw-Hill Education Pvt. Ltd.,2000.
2. K R Venugopal, Mastering C++, 2nd Edition, McGraw Hill Education, 2017.
3. Rajaram, R., Object Oriented Programming and C++, Second Edition, 2007
4. Saurav Sahay, Object Oriented Programming with C++, Oxford, 2006.

**List of Practical:**
1. Write a program to display the following output using a single cout statement. Maths=90,

Physics=74, Chemistry=76

2. Write a program to read 2 numbers from the keyboard and display the larger value on the screen.

3. Write a function using reference variables as arguments to swap the values of a pair of integers.

4. Write a macro that obtains the largest of 3 numbers.

5. Define a class to represent a bank account. Include the following members:
   Data members
   1. Name of the depositor
   2. Account number
   3. Type of account
   4. Balance amount in the account

   Member functions
   1. To assign initial values
   2. To deposit an amount
   3. To withdraw an amount after checking the balance
   4. To display name and balance

Write a main program to test the program.

6. Create two classes DM and DB which store the value of distances. DM stores distances in meters and centimeters and DB in feet and inches. Write a program that can read values for the class objects and odd one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which the result are required.

The display should be in the format of feet and inches or meters and centimeters depending on the object on display.

7. Design a constructor for bank account class.

8. A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required. If the requested copies book details and requests for the number of copies required. If the requested copies are available, the total cost of the requested copies is displayed; otherwise the message "Required copies not in stock" is displayed.

Design a system using a class called books with suitable member functions and Constructors. Use new operator in constructors to allocate memory space required.

9. Improve the system design in exercise 8 to incorporate the following features:

(a) The price of the books should be updated as and when required. Use a private meneber function to implement this.

(b) The stock value of each book should be automatically updated as soon as a transaction is completed.

(c) The number of successful transactions should be recorded for the purpose of statistical

analysis. Use static data members to keep count of transaction.

10. Design a C++ Class „Complex" with data members for real and imaginary part. Provide default and parameterized constructors. Write a program to perform arithmetic operations of two complex numbers using operator overloading (using either member functions or friend functions).

11. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class account that stores customer name, account number and type of account. From this derive the classes cur*acct and sav*acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

   a) Accept deposit from a costumer and update the balance.
   b) Display the balance
   c) Compute and deposit interest.
   d) Permit withdrawal and update the balance.
   e) Check for the minimum balance, impose penalty, necessary and update balance.

12. Create a base class shape. Use this class to store two double type values that could be used to compute area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base a member function getdata() to initialize base class data member and another member function display_area() to compute and display the area of figures. Make display_area() as a virtual function and redefine it the derived class to suit their requirements.

# Shri Vaishnav Vidyapeeth Vishwavidyalaya

## B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/DS/FSDB-IBM)
### Choice Based Credit System (CBCS) 2020-21
## SEMESTER II

| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | THEORY | | | PRACTICAL | |
| | | | | | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **HUCS101** | **UG** | **Communication Skills** | 1 | 0 | 2 | 2 | 60 | 20 | 20 | 0 | 20 |

**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. 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:**
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**
**Communication:** Nature, Meaning, Definition,Verbal and Non Verbal Communication Barriers to Communication.

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

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

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

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

**Text & Reference Books:**
1. Ashraf Rizvi.(200**5).**EffectiveTechnical Communication. NewDelhi:TataMcGrawHill

Chairperson
Board of Studies
(Computer Science & Engineering,
Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

2. Adair, John (2003). Effective Communication. London: Pan Macmillan Ltd.

3. A.J.ThomsonandA.V.Martinet(1991).APracticalEnglishGrammar(4<sup>th</sup>ed).Newyork:Ox-fordIBH 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: SudhaPublications.

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