Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIT401	**UG**	**Discrete Structures**	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 students will be able to:

1. To provide the fundamentals of formal techniques for solve the problems in computational domain and algorithm development

Course Outcomes:

The students should be able to:

1. Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking, and be able to apply them in problem solving.
2. Understand the basics of discrete probability and number theory, and be able to apply the methods from these subjects in problem solving.
3. Be able to use effectively algebraic techniques to analyze basic discrete structures and algorithms.
4. Understand asymptotic notation, its significance, and be able to use it to analyze asymptotic performance for some basic algorithmic examples.
5. Understand some basic properties of graphs and related discrete structures, and be able to relate these to practical examples.

SYLLABUS

UNIT–I

Set Theory: Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), proofs of some general identities on sets, pigeonhole principle. Relation: Definition, types of relation, composition of relations, domain and range of a relation, pictorial representation of relation, properties of relation, partial ordering relation. Function: Definition and types of function, composition of functions, recursively defined functions.

UNIT–II

Propositional logic: Proposition logic, basic logic, logical connectives, truth tables, tautologies, contradiction , normal forms(conjunctive and disjunctive), modus ponens and modus tollens, validity, predicate logic, universal and existential quantification. Notion of proof: proof by implication, converse, inverse, contrapositive, negation, and contradiction, direct proof, proof by using truth table, proof by counter example

UNIT–III

Graph Theory: Terminology Graph Representation Graph isomorphism; Connectedness; Various graph properties; Euler & Hamiltonian graph; Shortest paths algorithms. Trees: Terminology; Tree traversals; prefix codes; Spanning trees; Minimum spanning trees.

UNIT–IV

Algebraic Structure: Binary composition and its properties definition of algebraic structure; Groyas

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Semi group, Monoid Groups, Abelian Group, properties of groups, Permutation Groups, Sub Group, Cyclic Group, Rings and Fields (definition and standard results).

UNIT–V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices. Combinatorics: Introduction, Permutation and combination, Binomial Theorem, Multimonial Coefficients Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions.

Reference Books:

1. C L Liu, Introduction to Discrete Mathematics, McGrawHill, 1986 (Reprint by Tata McGraw Hill, 2007).
2. K Rosen, Discrete Mathematics and its Applications, 6/e (Special Indian Edition), Tata McGraw-Hill, 2007.
3. B Kilman, R Busby, S Ross, N Rehman, Discrete Mathematical Structures, 5/e, Pearson Education, 2006.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTCS502	**UG**	**Operating System**	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 fundamentals of Operating Systems.
2. To study the mechanisms of Operating System to handle processes and threads and their communication.
3. To gain knowledge of process management concepts that includes architecture, Mutual exclusion algorithms, deadlock detection and recovery algorithms.
4. To learn the mechanisms involved in memory management in Operating System.
5. To know the components and management aspects of disc scheduling.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. To describe the detail structure of Operating System.
2. To design and Implement Process management Techniques in Operating System.
3. To calculate CPU Scheduling criteria.
4. To understand The Memory Management of Operating System.
5. To elaborate Disc Scheduling.

Syllabus:

UNIT–I

Introduction to Operating System

Introduction and need of operating system, layered architecture/logical structure of operating system, Type of OS(Multiprogramming , Time Sharing, Real Time ,Networked, Distributed, Clustered, Hand Held), operating system as resource manager and virtual machine, OS services, BIOS, System Calls/Monitor Calls, Firmware- BIOS, Boot Strap Loader. Threads- processes versus threads, threading, concepts, models, kernel & user level threads, thread usage, benefits, multithreading models.

UNIT–II

Process Management: Process model, creation, termination, states & transitions, hierarchy, context switching, process implementation, process control block, Basic System calls- Linux & Windows. Basic concepts, classification, CPU and I/O bound, CPU scheduler- short, medium, long-term, dispatcher, scheduling:- preemptive and non-preemptive, Static and Dynamic Priority Criteria/Goals/Performance Metrics, scheduling algorithms- FCFS, SJFS, shortest remaining time, Round robin, Priority scheduling, multilevel queue scheduling, multilevel feedback queue scheduling.

UNIT–III

Interprocess communication- Introduction to message passing, Race condition, critical section

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

problem, Peterson's solution, semaphore, classical problems of synchronization Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem, Sleeping Barber Problem etc...
Deadlock- System model, resource types, deadlock problem, deadlock characterization, methods for deadlock handling, deadlock prevention, Deadlock Avoidance: Banker's algorithm, deadlock detection,recoveryfromdeadlock.

UNIT–IV

Memory management- concepts, functions, logical and physical address space, address binding, degree of multiprogramming, swapping, static & dynamic loading- creating a load module, loading, static & dynamic linking, shared libraries, memory allocation schemes- first fit, next fit, best fit, worst fit and quick fit. Free space management- bitmap, link list/free list.
Virtual Memory- concept, virtual address space, paging scheme, pure segmentation and segmentation with paging scheme hardware support and implementation details, memory fragmentation, demand paging ,working set model, page fault frequency, thrashing, page replacement algorithms- optimal, FIFO,LRU; Bleady's anomaly; TLB (translation look aside buffer).

UNIT–V

File Management- concepts, naming, attributes, operations, types, structure, file organization & access (Sequential, Direct ,Index Sequential) methods, memory mapped files, directory structures one level, two level, hierarchical/tree, acyclic graph, general graph, file system mounting, file sharing, path name, directory operations, overview of file system in Linux & windows.
Input/output subsystems- concepts, functions/goals, input/output devices- block and character, spooling, disk structure & operation, disk attachment, disk storage capacity, disk scheduling algorithm- FCFS, SSTF, scan scheduling, C-scan schedule.

Text Books:

1. Abraham Silberschatz,"Operating system concepts",7th,John Willey & Sons. INC, 2005
2. Andrew S.Tannanbaum, "Modern operating system", 3rd,Pearson Education, 2009
3. Dhananjay M. Dhamdhere, "Operating Systems:A concept Based Approach", 3rd TMH, 2012,
4. SibsankarHaldar, Alex AlagarsamyAravind,"Operating System", 8th ,Pearson Education India,, 2010,

Reference Books:

1. Achyut S Godbole,"Operating System",,3rd TMH,2010.
2. William Stalling, "operating system" 7th,Pearson Education, ,2012.
3. Vijay Shukla, "Operating System", 3rd, Kataria&Sons ,2010.
4. Singhal&Shivratri,"Advanced Concept in Operating Systems", TataMc-Graw Hill Education, edition 2001.

List of Practical:

1. Study of BIOS, Bootstrap Program & System calls.
2. Study of Process Life Cycle.
3. Implement First Come First Serve CPU Scheduling.
4. Implement Non Preemptive Priority CPU Scheduling.
5. Implement Non Preemptive Shortest Job first CPU Scheduling.
6. Implement Preemptive Shortest Job first CPU Scheduling.
7. Implement Preemptive Priority CPU Scheduling.
8. Implement Round-Robin CPU scheduling.

9. Write a program to implement Semaphore.
10. Design and implement Deadlock Avoidance algorithm; Banker's Algorithm.
11. Write a program for Memory Management Algorithms e.g. First Fit, Best Fit, Worst Fit.
12. Demonstrate Virtual memory Techniques like, LRU, FIFO etc.
13. Implement First Come-First Serve Disk Scheduling Algorithm.
14. Implement Shortest Seek Time First Disk Scheduling Algorithm.
15. Implement Scan Scheduling Disk Scheduling Algorithm.
16. Implement Circular Scan Disk Scheduling Algorithm.
17. Implement Look Disk Scheduling Algorithm.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIT305	**UG**	**Analysis and Design of Algorithms**	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:

At the end of the course

1. Ability to analyze asymptotic runtime complexity of algorithms including formulating recurrence relations. How to develop efficient algorithms for simple computational tasks and reasoning about the correctness of them?
2. The emphasis is on choosing appropriate data structures and designing correct and efficient algorithms to operate on these data structures.

Course Outcomes:

1. Define the basic concepts of algorithms and analyze the performance of algorithms.
2. Discuss various algorithm design techniques for developing algorithms.
3. Discuss various searching, sorting and graph traversal algorithms.
4. Understand NP completeness and identify different NP complete problems.
5. Discuss various advanced topics on algorithms.

Syllabus:

UNIT–I

Algorithms, Designing Algorithms, Analyzing Algorithms, Asymptotic Notations, Heap and Heap Sort, Brief Review of Graphs, Sets and Disjoint Set Union, Sorting and Searching Algorithms and their Analysis in terms of Space and Time Complexity. Divide and Conquer: General Method, Binary Search, Merge Sort, Quick Sort, Selection Sort, Strassen's Matrix Multiplication Algorithms.

UNIT–II

Greedy Method: General Method, Knapsack Problem, Job Sequencing with Deadlines, Minimum-Cost Spanning Trees, Single Source Shortest Paths.

UNIT–III

Dynamic Programming: General Method, Optimal Binary Search Trees, O/1 Knapsack, The Traveling Salesperson Problem, All Pairs Shortest Paths.

UNIT–IV

Backtracking: General Method, 8-Queens Problem, Graph Coloring, Hamiltonian Cycles, Sum of Subsets. Branch And Bound: Method, O/1 Knapsack Problem, Traveling Salesperson Problem, Efficiency Considerations, Techniques for Algebraic Problems, Some Lower Bounds Oon Parallel Computations.

UNIT–V

NP Hard and NP Complete Problems: Basic Concepts, Cook's Theorem, NP Hard Graph and NP

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Scheduling Problems, Some Simplified NP Hard Problems.

Reference Books:

1. Fundamental of Computer Algorithms, Ellis Horowitz and SartajSahni, Galgotia Publication.
2. Introduction to Algorithms, Thomas H Cormen, Charles E Leiserson and Ronald L Rivest, TMH.
3. Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, Naresh Publications.
4. Introduction to Design and Analysis of Algorithm, Goodman, S.E. &Hedetnieni, MGH.
5. Algorithms, Dasgupta, TMH.
6. Analysis & Design of Algorithm, Ullmann.
7. Algorithm Design, Michael T Goodrich and RobartoTamassia, Wiely India.

List of Practical:

1. Write a program for Iterative and Recursive Binary Search.
2. Write a program for Merge Sort.
3. Write a program for Quick Sort.
4. Write a program for Strassen's Matrix Multiplication.
5. Write a program for minimum spanning trees using Kruskal's algorithm.
6. Write a program for minimum spanning trees using Prim's algorithm.
7. Write a program for single sources shortest path algorithm.
8. Write a program for Floyd-Warshal algorithm.
9. Write a program for traveling salesman problem.
10. Write a program for Hamiltonian cycle problem.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTCS508	**UG**	**Essentials of Software Engineering (OOAD and SW Lifecycle)**	3	1	2	5	60	20	20	0	50

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 students will be able to:

1. Understand the process models and software life cycle and requirements gathering methods.
2. Ability to analyze and design the Software.
3. Build an understanding about system design.
4. Prepare the database design.
5. Understand about software testing and project management.

Course Outcomes:

The students should be able to:

1. Design the process models concept and can perform requirements gathering for projects.
2. Understand Analysis and Designing of Software.
3. Identify the criteria about system design.
4. Design the concept of database design.
5. Student will understand about software testing and project management.

Syllabus:

UNIT–I

Best Practices of Software Engineering, SDLC-Software Development Life Cycle, Different Process Models, Water Fall, Iterative, Incremental, Spiral Process Model, RAD, Agile Process-Scrum Framework, Extreme Programming, Requirements Overview-Functional Requirements, Non-Functional Requirement, Requirement Elicitation Techniques, Software Requirement Specification

UNIT–II

Analysis & Design: Key Concepts, Analysis and Design workflow, Functional Oriented Design, Object Oriented Design, Unified Modeling Language, Object Oriented Design-Behavioral Diagrams, Structural Diagrams, Use-Case Diagram, Activity, Sequence, Interaction Diagram, State Diagram, Collaboration Diagram, Deployment Diagram, Class Diagram, Object Diagram, Package Diagram, Component Diagram

UNIT-III

Subsystem Design: Subsystem Design in Context, Distribute subsystem behavior to subsystem elements, Document subsystem elements, Describe subsystem dependencies, Review:

Subsystem Design. Class Design: Class Design Overview, Create Initial Design Classes, Define Operations, and Define Methods. Define States. Define Attribute, Define Dependencies, Define Associations, Generalization Constraints, Resolve Use-Case Collisions, Handle Non-Functional Requirements in General, Review.

UNIT-IV

Database Design: Database Design Overview, Map persistent design classes to the data Model Distribute class behavior to the database Review Database Design.

UNIT–V

Software Testing: Non-Functional, Functional Testing, Software Testing Life Cycle, Test Cases, Test Suite, Types Of Testing-Unit, Integration, Regression, System Testing, White Box, Black Box Testing, Non-Functional Testing, Functional Testing, Performance Testing, Software Quality Assurance, Testing Tools Overview and Introduction-Web Application Testing Tools, Selenium-Web Driver, IDE, JMeter, Appium, Software Project Management.

Text Books:

1. Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process",CENGAGE Learning. 1st edition 2007
2. Michael Blaha and J. Rumbugh, "Object oriented Modeling and design with UML", Pearson Education, Paperback 2006
3. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning

Reference Books:

1. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
2. IBM Manual Book "Essentials of Software Engineering (OOAD & SW Lifecycle)", February 2013 edition, IBM

List of Practical:

1. Introduction of UML.
2. Introduction of SRS Report.
3. List out some free tools and license tools for UML.
4. Describe RSA and Start UML
5. Requirement gathering and elicitation for project.
6. Describe Use-case diagram? Draw Use-case for your project.
7. Describe Class diagram? Draw Class diagram for your project.
8. Describe Activity diagram? Draw activity diagram for your project.
9. Describe sequence diagram? Draw sequence diagram for your project.
10. Describe scrum process framework and agile.
11. Software testing Tools Selenium.
12. Write test cases for your projects.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIT502	**UG**	**Computer Networks**	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 should be made to:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of sub netting and routing mechanisms.

Syllabus:

UNIT–I

Computer Network: Definitions, goals, components, Architecture, Classifications & Types. Layered Architecture: Protocol hierarchy, Design Issues, Interfaces and Services, Connection Oriented & Connectionless Services, Service primitives, Design issues & its functionality. ISO- OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization.

UNIT–II

Data Link Layer: Need, Services Provided, Framing, Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Bit oriented protocols: SDLC, HDLC, BISYNC, LAP and LAPB.

UNIT–III

MAC Sublayer: MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), CSMA/CA, CSMA/CD Ethernet, token bus, token ring, (IEEE 802.3, IEEE 802.4, IEEE 802.5)

UNIT–IV

Network Layer: Need, Services Provided , Design issues, Routing and congestion in network layer, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multi cast Routing. IP protocol, IP Addresses, Subneeting,

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Comparative study of IPv4 & IPv6, Mobile IP.

UNIT–V

Transport Layer: Design Issues, UDP: Header Format, Per-Segment Checksum, Carrying Unicast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management. Session layer: Authentication, Authorization, Session layer protocol. Presentation layer: Data conversion, Encryption and Decryption, Presentation layer protocol (LPP, Telnet, X.25 packet Assembler/Disassembler).Application Layer: WWW and HTTP, FTP, SSH, Email (SMTP, MIME, IMAP), DNS, Network Management (SNMP).

Text Books:

1. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

Reference Books:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. "Networking Fundamentals", KavehPahlavan, PrashantKrishnamurthy,Wiley Publication.
3. "Computer Communications & Networking Technologies" Michael A. Gallo & William M. Hancock Cengagepearsen publications.

List of Practical:

1. Study of Different Types of Network Equipment's.
2. Color coding standard of CAT 5, 6, 7 and crimping of cable in RJ-45.
3. LAN installations and Configurations.
4. Study of basic network command and Network configuration commands.
5. Study of network IP.
6. Write a program to implement various types of error correcting techniques.
7. Write a program to implement various types of farming methods.
8. Study of Tool Command Language (TCL).
9. Study and Installation of Standard Network Simulator: N.S-2.
10. Implement & simulate various types of routing algorithm.
11. Study & Installation of ONE (Opportunistic Network Environment) Simulator for High
12. MobilityNetworks.
13. Simulate STOP AND WAIT Protocols on NS-2.
14. Simulate various Routing Protocol on NS-2.
15. Simulate various Network Topologies on NS-2.
16. Configuring routers, bridges and switches and gateway on NS-2.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTCS511	**UG**	**Artificial Intelligence**	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. Know how to build simple knowledge-based systems.
2. Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms).
3. Ability to apply knowledge representation, reasoning, and machine learning techniques to real-world problems.
4. An ability to use current techniques, skills, and tools necessary for computing practice

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Describe the key components of the artificial intelligence (AI) field and its relation and role in Computer Science;
2. Identify and describe artificial intelligence techniques, including search heuristics, knowledge representation, automated planning and agent systems, machine learning, and probabilistic reasoning;
3. Identify and apply AI techniques to a wide range of problems, including complex problem solving via search, knowledge-base systems, machine learning, probabilistic models, agent decision making, etc.;
4. Design and implement appropriate AI solution techniques for such problems;
5. Analyze and understand the computational trade-offs involved in applying different AI techniques and models.
6. Communicate clearly and effectively using the technical language of the field correctly.

Syllabus:

UNIT–I

INTRODUCTION TO AL AND PRODUCTION SYSTEMS:

Introduction to AI- Problem formulation, Problem Definition Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics –Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT–II

REPRESENTATION OF KNOWLEDGE

Knowledge Representation Issues: Representations and Mappings, Approaches to Knowledge Representation. Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation ofknowledge.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

UNIT–III

KNOWLEDGE INFERENCE

Knowledge Inference -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT IV

PLANNING AND MACHINE LEARNING

Basic plan generation systems - Strips -Advanced plan generation systems – K strips -Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning.

Game Playing: Overview, And Example Domain : Overview, Mini-Max, Alpha-Beta Cut-off, Refinements, Iterative deepening, The Blocks World, Components Of A Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems, Other Planning Techniques.

UNIT–V

EXPERT SYSTEMS

Expert Systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition –Meta knowledge, Heuristics. Typical expert systems - MYCIN, DART, XOON, Expert systems shells.

Text Books:

1. Rich E and Knight K, Artificial Intelligence, TMH New Delhi.
2. Nelsson N.J., Principles of Artificial Intelligence, Springer Verlag, Berlin.
3. Kos Ko B, Neural Networks and Fuzzy system –PHI.

Reference Books:

1. Neural Network, Fuzzy Logic, and Genetic Algorithms - Synthesis and Applications", by S. Rajasekaran and G.A. VijayalaksmiPai, (2005), Prentice Hall, Chapter 1-15, page 1-435.
2. "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, (2002), Prentice Hall, Chapter 1-27, page 1-1057.
3. Waterman D.A., A guide to Expertsystem, Adision - Wesley, Reading
4. Artificial Intelligence Hand book, Vol. 1-2, ISA, Research Triangle Park.
5. Haykin S, Artificial Neural Networks-Comprehensive Foundation, Asea, Pearson.
6. Barr A, Fergenbaub E.A. and Cohen PR. Artificial Intelligence, Addison Wesley, Reading.

List of Practical:

1. Write a program to implement Tic-Tac-Toe game problem.
2. Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search problem).
3. Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search problem)
4. Write a program to implement Single Player Game (Using Heuristic Function)
5. Write a program to Implement A* Algorithm.
6. Write a program to solve N-Queens problem.
7. Write a program to solve 8 puzzle problems.
8. Write a program to solve travelling salesman problem.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIT512	**UG**	**Information Theory and Coding**	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:

1. Students will be introduced to calculate entropy, channel capacity, bit error rate, code rate, and steady-state probability.
2. Students will be introduced to convolutional and block codes, decoding techniques.
3. Students will understand how error control coding techniques are applied in communication systems.
4. Students will be able to describe the real life applications based on fundamental theory.
5. Students will implement the encoder and decoder of one block code using any programming language.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Derive equations for entropy mutual information and channel capacity for all typesofchannels.
2. Distinguish between different types error correcting codes based on probability of error and bit Energy to noise ratio.
3. Design a digital communication system by selecting an appropriate error correcting codesfor a particular application.
4. Explain various methods of generating and detecting different types of error correcting codes.
5. Formulate the basic equations of linear block codes.
6. Compare the performance of digital communication system by evaluating the probability of error for different error correcting codes

Syllabus:

UNIT-I

Information Theory, Probability and Channel: Introduction, Information Measures, Review probability theory, Random variables, Processes, Mutual Information, Entropy, Uncertainty, Shannon's theorem, redundancy, Huffman Coding, Discrete random Variable. Gaussian random variables, Bounds on tail probabilities.

UNIT-II

Stochastic Processes: Statistical independence, Bernoulli Process, Poisson Process, Renewal Process, Random Incidence, Markov Modulated Bernoulli Process, Irreducible Finite Chains with Aperiodic States, Discrete-Time Birth-Death Processes, Markov property, Finite Markov Chains, Continuous time Markov chain, Hidden Markov Model.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

UNIT-III

Error Control Coding: Channel Coding: Linear Block Codes: Introduction, Matrix description, Decoding, Equivalent codes, Parity check matrix, Syndrome decoding, Perfect codes Hamming Codes, Optimal linear codes. Maximum distance separable (MDS) codes. Cyclic Codes: Introduction, generation, Polynomials, division algorithm, Matrix description of cyclic codes, burst error correction, Fire Codes, Golay Codes, and CRC Codes..

UNIT-IV

BCH Codes: Introduction, Primitive elements, Minimal polynomials, Generator Polynomials in terms of Minimal Polynomials, Decoding of BCH codes. Advance Coding Techniques: Reed-Solomon codes, space time codes, concatenated codes, turbo coding and LDPC codes, Nested Codes, block. Techniques for constructing more complex convolution codes with both soft and hard decoding

UNIT-V

Convolutional channel coding: Introduction, Linear convolutional codes, Transfer function representation & distance properties, Decoding convolutional codes(Soft-decision MLSE, Hard-decision MLSE),The Viterbi algorithm for MLSE, Performance of convolutional code decoders, Soft & Hard decision decoding performance, Viterbi algorithm implementation issues: RSSE, trellis truncation, cost normalization, Sequential decoding: Stack, Fano, feedback decision decoding, .

Text Books:

1. Rajan Bose "Information Theory, Coding and Cryptography", TMH, 2002.
2. Kishor S. Trivedi "Probability and Statistics with Reliability, Queuing and Computer Science Applications", Wiley India, Second Edition.
3. J.C.Moreira, P.G. Farrell "Essentials of Error-Control Coding", Willey Student Edition
4. San Ling and Chaoping "Coding Theory: A first Course", Cambridge University Press, 2004.
5. G A Jones J M Jones, "Information and Coding Theory", Springer Verlag, 2004.

Reference Books:

1. Cole, "Network Security", Bible, Wiley INDIA, Second Addition
2. Proakis and Masoud, "Digital Communication" ,McGraw-Hill ,2008.
3. Principles of Digital Communications, Signal representation, Detection , Estimation &Information
4. Coding by J Das, S.K. Mullick, P.K.Chatterjee, New Age Int. Ltd.
5. Principles of Communication Systems, Taub&Schilling, 2/e, TMH Publishers

List of Practical:

1. Write a program for determination of various entropies and mutual information of a given channel.
2. Test various types of channel such as a) Noise free channel. b) Error free channel c) Binary symmetric channel d) Noisy channel Compare channel capacity of above channels.
3. Write a program for generation and evaluation of variable length source coding using C/MATLAB a) Shannon – Fano coding and decoding
   b) Huffman Coding and decoding
   c) Lempel Ziv Coding and decoding
4. Write a Program for coding & decoding of Linear block codes.

5. Write a Program for coding & decoding of Cyclic codes.
6. Write a program for coding and decoding of convolution codes.
7. Write a program for coding and decoding of BCH and RS codes.
8. Write a program to study performance of a coded and uncoded communication system (Calculate the error probability).
9. Write a simulation program to implement source coding and channel coding for transmitting a text file.
10. Encoding the data bits using a Binary Cyclic block encoder in Simulink.
11. Decoding the code words using a Binary Cyclic block decoder in Simulink.
12. Encoding the data bits using a Binary Linear block encoder in Simulink.
13. Decoding the code words using Binary Linear block decoder in Simulink.

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTCS514	**UG**	**Data Warehouse and Mining**	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 understand the basic principles, concepts and applications of data mining.
2. To identify and implement several methods to enhance and develop information systems and to manage the information system resources.
3. To develop skills of using recent data mining software for solving practical problems.
4. To gain experience of doing independent study and research.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Show how to plan, acquire, and maintain information systems using data mining techniques.
2. Identify components in typical data mining architecture.
3. Understand typical knowledge discovery process and the different algorithms available by popular commercial data mining software.
4. Obtain hands-on experience with some popular data mining software.

Syllabus:

UNIT–I

Data warehousing Components –Building a Data warehouse –- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT–II

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools– OLAP Tools and the Internet.

UNIT–III

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns, Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse Issues Data Preprocessing.

UNIT–IV

Mining Frequent Patterns, Associations and Correlations Mining Methods Mining Various Kinds of Association Rules Correlation Analysis Constraint Based Association Mining

Classification and Prediction - Basic Concepts - Decision Tree Induction Bayesian Classification Rule Based Classification – Classification by Back propagation, Support Vector Machines Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNIT–V

Cluster Analysis - Types of Data Categorization of Major Clustering Methods, K-meansPartitioningMethods, HierarchicalMethods-Density-BasedMethods–Grid Based Methods, Model-Based Clustering Methods – Clustering High Dimensional Data- Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

Text Books:

1. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", TataMcGraw Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and MichelineKamber,"Data Mining Concepts and Techniques", SecondEdition, Elsevier, 2007.

Reference Books:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
2. K.P.Soman,ShyamDiwakarandV.Ajay"InsightintoDataminingTheoryandPractice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G.K.Gupta,"IntroductiontoDataMiningwithCaseStudies", EasterEconomyEdition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006.

List of Practical:

1. Installation of any data mining tool.
2. Demonstration of preprocessing on dataset.
3. Demonstration of association rule mining process on dataset.
4. Demonstration of classification rule process on dataset
5. Demonstration of clustering rule process on dataset.
6. Evaluate attribute relevance analysis on a weather data warehouse
7. Evaluate Information Gain of an attribute in the student database
8. Experiment to predict the class using the Bayesian classification

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIBDA501	**UG**	**Predictive Analytics**	0	0	2	1	0	0	0	0	50

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 students will be able to:

1. The importance of analytics and how it's transforming the world today
2. Understand how analytics provided a solution to industries using real case studies
3. Explain what analytics, the various types of analytics, is and how to apply it.
4. Improve efficiency, sample records, and work with sequence data
5. Explain data transformations, and functions
6. Understand modeling, relationships, derive and reclassify fields
7. Integrate and collect data
8. Understand the principles of data mining
9. Use the user interface of modeler to create basic program streams
10. Read a statistics data file into modeler and define data characteristics
11. Review and explore data to look at data distributions and to identify data problems, including missing values
12. Use the automated data prep node to further prepare data for modeling
13. User a partition node to create training and testing data subsets

Course Outcomes:

The students should be able to:

1. To illustrate the interaction of multi-faceted fields like data mining, statistics and mathematics in the development of Predictive Analytics.
2. To acquaint the student with the concepts of Ordinary Least Squares & Generalized Least Squares.
3. To make the student familiar with various data relationships techniques and methodology.
4. To acquire the knowledge of functions, Data Transformations, Working with Sequence Data, Sampling Records, Improving Efficiency
5. To make the student familiar with various Automated Data Mining knowledge

Syllabus:

Unit 1:

Introduction to Data Mining: Data-Mining Application, A strategy for Data Mining: CRISP-DM, Stages and Tasks in CRISP-DM, Life Cycle of a Data-Mining Project, Skills Needed for Data Mining.

Working with Modeler: Introducing Nodes and Streams, Explore the user Interface, Creating Streams-General Rules, Placing Nodes, Managing Nodes, Managing Connections, Encapsulating Nodes in a super Node, Generating Nodes from Output, Running Streams.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

A Data-Mining Tour: The Basic framework of a Data-Mining Projects, Business Case, A Predictive Model, Deploying the Model, A Data-Mining project in Modeler, Building the Model-Setting roles in Type Node, Score Records, Filter and Sort.

Collecting Initial Data: Rectangular Data Structure, The Unit Analysis, Field Storages, Field Measurement Levels, Storage and Measurement level, Fields Instantiation, Importing Data, The Sources Dialog Boxes- Data Tab, Importing Text Files, Exporting data.

Unit 2:

Understanding Your Data: Data Audit, Using Statistics Node and Graphs Nodes for Reporting, Describe Types of Invalid Values, Action for Invalid Values, Dealing with Missing Data, Reporting Blanks in a Data Audit.

Setting the Unit Of Analysis: The Required Unit of Analysis, Methods to create datasets with the required unit of analysis, Distincting Records, Aggregating Records, Setting To Flag Fields.

Integrating Data: Methods to Integrate Data, Appending Records, Merging Fields, Sampling Records, Caching Data

Deriving and Reclassifying Fields : Methods To Create Fields, Introducing The Control Language For Expression Manipulation (Clem), Deriving fields And Blanks, Reclassifying Fields, Checking Your Results.

Unit 3:

Looking For Relationships: Methods To Examine The Relationship Between Two Fields, Explore Matrix Output, Distribution Output, Means Output, Histogram Output, Statistics Output, Plot Output.

Introduction To Modeling: Modeling Objectives, Objectives And Roles In The Type Node, Types Of Classification Models, Rule Induction Models, Traditional Statistical Models, Machine Learning Models, Running Classification Models, Modeling Results: The Model Nugget, Evaluating Classification Models, Applying Classification Models, Segmentation Models, Running Segmentation Models, Examining The Results: Cluster Profiles.

Unit 4:

Using Functions: Using Date And Time Functions, Using Conversion Functions, Using String Functions, Using Statistical Functions, Using Missing Value Functions

Data Transformations: Selecting A Method To Transform Data, Filling Fields, Binning Fields, Data Transformations.

Working with Sequence Data: Sequence Data, Using Cross-Record Functions, Deriving A Counter Field, Deriving A Counter Field, Restructuring Data, Using Geospatial And Time Data.

Sampling Records: Selecting A Sampling Method, Selecting A Simple Sampling Method, Selecting A Complex Sampling Method, Using Partitioning, Balancing Record.

Improving Efficiency: Using Sql Pushback, Previewing Sql, Identifying A-Typical Values, Processing Missing Values, Imputing Missing Values, Using Globals, Using Parameters, Using Conditional Execution And Looping

Unit 5:

Automated Data Mining: The basics of using a modeler, Adding nodes and creating streams in the modeler, Reading data files, Data exploration, Automated data preparation, Data partitioning, Predictor selection for modeling, Automated models for categorical targets, Model evaluation, Automated models for continuous targets, Deploying models.

References:

1. https://developer.ibm.com/predictiveanalytics/videos/category/tutorials/
2. https://www.ibm.com/developerworks/library/ba-predictive-analytics1/index.html

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTICMC501	**UG**	**Business Process Management**	0	0	2	1	0	0	0	0	50

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. Ease of maintenance.
2. High-quality development strategies.
3. Business process definition (BPD) from business requirements that are identified during process analysis.
4. How to make team collaboration more efficient by enabling all team members to use standard Business Process Model and Notation (BPMN) elements.

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Establish the importance of process modeling.
2. IBM Business Process Manager and integration with other tools.
3. List and describe the core notation elements that are used in IBM Process Designer
4. How to create a decision service, implement message events, apply asset tagging, and access and manipulate external data. You learn about exposed process variables (EPVs) and environment variables (EPVs).
5. Error handling patterns that are used in your process application.

Syllabus:

UNIT–I Business Process Overview Starting and Succeeding with IBM Business Process Manager, Course Introduction, Understanding the BPM value proposition, Building a process driven culture, Leveraging BPM delivery best practices.

UNIT–II Business Process Foundations Introducing IBM Business Process Manager, Course Introduction, Introducing IBM Business Process Manager, Process Modeling with IBM Business Process Manager, Business Process Manager Advanced,

UNIT–III Business Process Developer Process Implementing with IBM Business Process Manager, Introduction to business process management, Introduction to IBM Business Process Manager, Modeling the as-is business process, Modeling the to-be business process.

UNIT–IV Process Application Creating a process application, modeling process flow, controlling process flow, Building consensus, IBM Business Process Manager Architecture, Controlling process flow, Business data, services, and coaches, Enhancing coaches.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

UNIT–IV User interface design and implementation User interface design and implementation, conducting the Playback session, Integrations, Hardening processes and services, Deploying process applications.

List of Practical:

1. Creating a case.
2. Creating a process application.
3. Controlling process flow.
4. Validating the process model.
5. Controlling process flow of IBM Business Process Manager Architecture.
6. Business data, services, and coaches.
7. To perform User interface design and implementation.
8. To conduct the Playback sessions.
9. To Perform Integrations.
10. To Deploy process applications.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

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*
BTIT406	**UG**	**Unix and Shell Programming**	0	0	2	1	0	0	0	0	50

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 course content should be taught and implemented with the aim to develop required skills so that students are able to acquire following competency:

1. Know the basics of UNIX operating system and shell programming.

Course Outcomes:
Upon completion of the subject, students will be able to:

1. Work on any Unix platform with confidence
2. Write the code in C language on UNIX platform.
3. Write effective scripts for their day to day jobs
4. Understand and use most of the Unix features and commands

Syllabus:

Unit-I: Introduction to UNIX The UNIX Operating System, The UNIX Architecture, Features of UNIX, Internal And External Commands, Command Structure.GENERAL-PURPOSE UTILITIES: cal, date, echo, printf, bc, script, passwd, PATH, who, uname, tty, stty, pwd, cd, mkdir, rmdir, od.

Unit-II: Handling Files and C Environment The File System, cat, cp, rm, mv, more, file, ls, wc, pg, cmp, comm, diff, gzip, tar, zip, df, du, mount, umount, chmod, The vi editor ,security by file Permissions. NETWORKING COMMANDS: ping, telnet, ftp, finger, arp, rlogin. The C compiler, vi editor, compiler options, and run the programs.

Unit-III: Shell Basics Types of shells , Shell functionality, Work Environment, Writing script & executing basic script, Debugging script, Making interactive scripts, Variables (default variables), Mathematical expressions. Conditional statements: If-else-elif, Test command, Logical operators-AND, OR, NOT, Case –esac. Loops: While, For, Until, Break & continue.

Unit- IV: Command Line Arguments and Regular Expression Command line arguments: Positional parameters, Set & shift, IFS. Functions & file manipulations: Processing file line by line, Functions. Regular Expression & Filters: What is regular expression, Grep, cut, sort commands, Grep patterns.
Unit –V:SED and AWK SED: Scripts, Operation, Addresses, commands, Applications, grep and sed. AWK: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE-Big Data Analytics/Cloud and Mobile Computing-IBM)

Choice Based Credit System (CBCS) 2017-18

SEMESTER V

Text Books:

1. Graham Glass, King Ables, "Unix for programmers and users", 3rd Edition, Pearson Education, 2009.
2. N.B Venkateswarlu, "Advanced Unix programming", 2ndEdition, BS Publications, 2010.
3. YashwanthKanitkar,"Unix Shell programming", 1stEdition, BPB Publisher, 2010.

Reference Books:

1. Sumitabha Das, "Unix Concepts and Applications", 4thEdition. TMH, 2006.
2. Behrouz A. Forouzan, Richard F. Gilbery, "Unix and shell Programming", 1stEdition,
3. Cengage Learning India, 2003.

List of Practical's:

1. Installation of Unix/Linux operating system.
2. Study of Unix general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, al, logout, shutdown) commands.
3. Study of vi editor.
4. Study of Bash shell, Bourne shell and C shell in Unix/Linux operating system.
5. Write a C program to check whether the given string is palindrome or not using Command line
6. substitution.
7. Write a C program to check the given integer is prime or not.
8. Write a C program to check whether the given number is Avogadro number or not.
9. Write a C program that accept two integers as its arguments and computes the value of first number
10. raised to the power of second number.
11. Write a shell script program to display list of user currently logged in.
12. Write a shell script program to display "HELLO WORLD".
13. Write a shell script program to develop a scientific calculator.
14. Write a shell Script program to check whether the given number is even or odd.
15. Shell script Program to search whether element is present is in the list or not.
16. Shell script program to check whether given file is a directory or not.
17. Shell script program to count number of files in a Directory.
18. Shell script program to copy contents of one file to another.
19. Create directory, write contents on that and Copy to a suitable location in your home directory.
20. Use a pipeline and command substitution to set the length of a line in file to a variable.
21. Write a program using sed command to print duplicated lines of Input.
22. Write a grep/egrep script to find the number of words character, words and lines in a file.
23. Write an awk script to develop a Fibonacci series.
24. Write an awk script to display the pattern of given string or number.
25. Write an egrep script to display list of files in the directory.

Chairperson
Board of Studies
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore