



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 III

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 on 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 provide the fundamentals of formal techniques for solve the problems in computational domain and algorithm development
2. Apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
3. Formulate and evaluate possible solutions to problems, and select and defend the chosen solutions
4. Construct graphs and charts, interpret them, and draw appropriate conclusions

Course Outcomes:

Upon completion of the subject, students will 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,



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SEMESTER III

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 and 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 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, Multinomial 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.

Text Books:

1. C.L.Liu, "Elements of Discrete Mathematics", 4th Edition, Tata McGraw-Hill, 2012.
2. Kenneth H. Rosen, "Discrete Mathematics and its applications", 7th Edition, Tata McGraw-Hill, 2012.
3. V. Krishnamurthy, "Combinatorics: Theory and Applications", 2nd Edition, East-West Press, 2008.
4. Seymour Lipschutz, M.Lipson, "Discrete Mathemataics", 3rd Edition, Tata McGraw Hill, 2009.

Reference Books:

1. Trembley, J.P & Manohar; "Discrete Mathematical Structure with Application CS", Tata McGraw Hill.
2. Bisht, "Discrete Mathematics", Oxford University Press, 2015.
3. Biswal, "Discrete Mathematics & Graph Theory", 3rd Edition, PHI, 2011.


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SEMESTER III

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS302	UG	Data Communication	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 on 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 concepts of data communications.
2. To be familiar with the Transmission media and Tools.
3. To study the functions of OSI layers.
4. To learn about IEEE standards in computer networking.
5. To get familiarized with different protocols and network components.

Course Outcomes:

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

1. Understand the Process and functions of data communications
2. Understand Transmission media and Tools
3. Understand the functions of OSI layers
4. Understand IEEE standards in computer networking
5. Understand different protocols and network components

Syllabus:

UNIT I

Introduction: Data Communication Components, Types of Connections, Transmission Modes, Network Devices, Topologies, Protocols and Standards, OSI Model, Transmission Media, Bandwidth, Bit Rate, Bit Length, Baseband and Broadband Transmission, Attenuation, Distortion, Noise, Throughout, Delay and Jitter.

UNIT II

Data Encoding: Unipolar, Polar, Bipolar, Line and Block Codes. Multiplexing: Introduction and History, FDM, TDM, WDM, Synchronous and Statistical TDM. Synchronous and Asynchronous transmission, Serial and Parallel Transmission.

UNIT III

Error Detection & Correction: Correction, Introduction–Block Coding–Hamming Distance, CRC, Flow Control and Error Control, Stop and Wait, Error Detection and Error Go Back– N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, CSMA/CD, CDMA/CA



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UNIT IV

Network Switching Techniques: Circuit, Message, Packet and Hybrid Switching Techniques. X.25, ISDN. Logical Addressing, Ipv4, Ipv6, Address Mapping, ARP, RARP, BOOTP and DHCP, User Datagram Protocol, Transmission Control Protocol, SCTP.

UNIT V

Application Layer Protocols: Domain Name Service Protocol, File Transfer Protocol, TELNET, WWW and Hyper Text Transfer Protocol, Simple Network Management Protocol, Simple Mail Transfer Protocol, Post Office Protocol v3.

Text books:

1. Behrouz A. Forouzan, “Data communication and Networking”, Fourth Edition, Tata McGraw Hill, 2011.

Reference Books:

1. Larry L. Peterson, Peter S. Davie, “Computer Networks”, Fifth Edition, Elsevier, 2012.
2. William Stallings, “Data and Computer Communication”, Eighth Edition, Pearson Education, 2007.
3. James F. Kurose, Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2005.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS403	UG	Data Structure and 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 on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To understand efficient storage mechanisms of data for an easy access.
2. To design and implementation of various basic and advanced data structures.
3. To introduce various techniques for representation of the data in the real world.
4. To develop application using data structures.
5. To understand the concept of protection and management of data.

Course Outcomes:

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

1. Get a good understanding of applications of Data Structures.
2. Develop application using data structures.
3. Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
4. Decide the appropriate data type and data structure for a given problem.
5. Select the best algorithm to solve a problem by considering various problem characteristics, such as the data size, the type of operations, etc.

Syllabus:

UNIT I

Introduction: Overview of Data structures, Types of data structures, Primitive and Non Primitive data structures and Operations, Introduction to Algorithms & complexity notations. Characteristic of Array, One Dimensional Array, Operation with Array, Two Dimensional Arrays, Three or Multi-Dimensional Arrays, Sparse matrix, Drawbacks of linear arrays. Strings, Array of Structures, Pointer and one dimensional Arrays, Pointers and Two Dimensional Arrays, Pointers and Strings, Pointer and Structure.

UNIT II

Linked List: Linked List as an ADT, Linked List Vs. Arrays, Dynamic Memory Allocation & De-allocation for a Linked List, Types of Linked List: Circular & Doubly Linked List. Linked List operations: All possible insertions and deletion operations on all types of Linked list Reverse a Single Linked List; Divide a singly linked list into two equal halves, Application of Linked List.

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SEMESTER III

UNIT III

Stack: The Stack as an ADT, Stack operation, Array Representation of Stack, Link Representation of Stack, Application of stack – Recursion, Polish Notation . Types of Recursion, problem based on Recursion: Tower of Hanoi. **The Queue :**The Queue as an ADT, Queue operation, Array Representation of Queue, Linked Representation of Queue, Types of Queue :Circular Queue & Dequeue, Introduction of Priority Queue, Application of Queues.

UNIT IV

Tree: Definitions and Concepts of Binary trees, Types of Binary Tree, Representation of Binary tree: Array & Linked List. General tree, forest, Expression Tree. Forest and general tree to binary tree conversion. Binary Search Tree Creation, Operations on Binary Search Trees: insertion, deletion & Search an element, Traversals on Binary SEARCH TREE and algorithms. Height balanced Tree: AVL, B-Tree, 2-3 Tree, B+Tree: Creation, Insertion & Deletion.**Graph:** Definitions and Concepts Graph Representations: Adjacency MATRIX, Incidence matrix, Graph TRAVERSAL (DFS & BFS), Spanning Tree and Minimum Cost Spanning Tree: Prim's & Kruskal's Algorithm.

UNIT V

Sortings: Sorting Concept and types of Sorting, Stable & Unstable sorting. Concept of Insertion Sort, Selection sort, Bubble sort, Quick Sort, Merge Sort, Heap & Heap Sort, Shell Sort & Radix sort. Algorithms and performance of Insertion, selection, bubble, Quick sort & Merge sort.

Text books:

1. Ashok N. Kamthane, "Introduction to Data structures", 2nd Edition, Pearson Education India,2011.
2. Tremblay & Sorenson, "Introduction to Data- Structure with applications", 8th Edition, Tata McGrawHill,2011.
3. Bhagat Singh & Thomas Naps, "Introduction to Data structure", 2nd Edition, Tata McGrawHill 2009.
4. Robert Kruse, "Data Structures and Program Design",2nd Edition,PHI,1997.
5. Lipschutz Seymour,"Data structures with C" ,1st Edition ,Mc- GrawHill,2017.

Reference Books:

1. Rajesh K. Shukla ,Data Structures Using C & C++, Wiley-India 2016.
2. ISRD Group ,Data Structures Using C, TataMcGraw-Hill 2015.
3. E. Balagurusamy ,"Data Structure Using C" ,Tata McGraw-Hill 2017.
4. Prof. P.S. Deshpande, Prof. O.G. Kakde, C & Data Structures, Charles River Media 2015 .
5. Gav Pai, Data Structures, Tata McGraw-Hill, 2015.

List of Practical:

1. To develop a program to find an average of an array using AVG function.
2. To implement a program that can insert, delete and edit an element in array.
3. To implement an algorithm for insert and delete operations of circular queue and implement the same using array.
4. Write a menu driven program to implement the push, pop and display option of the stack



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with the help of static memory allocation.

5. Write a menu driven program to implement the push, pop and display option of the stack with the help of dynamic memory allocation.
6. Write a menu driven program to implementing the various operations on a linear queue with the help of static memory allocation.
7. Write a menu driven program to implementing the various operations on a linear queue with the help of dynamic memory allocation.
8. Write a menu driven program to implement various operations on a linear linked list.
9. Write a menu driven program to implement various operations on a circular linked list
10. Program for implementation of Bubble sort
11. Program for Insertion sort
12. Program for Merge Sort
13. Program to implement Heap sort
14. Program to implement Quick sort
15. Program to Construct a Binary Search Tree and perform deletion, inorder traversal on it
16. To develop an algorithm for binary tree operations and implement the same.
17. To design an algorithm for sequential search, implement and test it.
18. To develop an algorithm for binary search and perform the same.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIBM401	UG	Cloud Computing: Project Based Learning	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 on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. Understand the evolution and impact of cloud computing in the world today.
2. Understand the evolution and impact of cloud computing in the world today.
3. Explore end-to-end case studies for every key cloud industry and identify common patterns: public cloud, private cloud, hybrid cloud.
4. Understand technical aspects of cloud solutions: software as a service, platform as services and infrastructure as a service.
5. Build cognitive solutions, leveraging AI and data science in cloud solutions.
6. Understand industry practices to design and build agile cloud solutions, using the cloud Garage methodology.
7. Work in teams jointly exploring real-world cloud scenarios.
8. Prototype bespoke cloud solutions leveraging industry-proven concepts, technologies and mythologies.

Course Outcomes:

1. Understand how deep our industries and societies rely on the cloud computing global infrastructure.
2. Identify the consumer massive adoption of cloud computer application through mobile devices.
3. Understand the role that cloud computing plays in the digital modernization journey of organization today.
4. Validate the different patterns of cloud computing adoption including public cloud services, private enterprise setting and hybrid approaches.
5. Identify common challenges associated with the adoption of cloud computing solutions.

Syllabus:

UNIT I : CLOUD COMPUTING LANDSCAPE

- Cloud impact in our lives
- Cloud enterprise adoption
- Cloud services
- Summary & resources


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SEMESTER III

CLOUD INDUSTRY ADOPTION

- Drivers for Digital Transformation
- Cloud Impact in Banking
- Cloud Impact in Education
- Summary & resources

UNIT II : API PLATFORM REVOLUTION

- Cloud Culture of Change
- API Platforms Landscape
- APIs driving the Cloud platform revolution
- Summary & resources

UNIT III: DATA IN THE CLOUD

- Where and how will data be used?
- Why use NoSQL?
- Attributes of NoSQL databases
- Summary & resources

UNIT IV: CLOUD AND AI

- AI Industry Adoption
- AI Evolution
- Empowered Cloud Apps with AI
Summary & resources

CLOUD FOR MULTI-CHANNEL

- The Need for a Multi-channel platform
- Multi-channel platform characteristics
- Rapid and Intelligent
Summary and resources

UNIT V: CLOUD SECURITY

- Cloud Security landscape
- Security concerns in microservices
- OAuth protocol
Summary & resources

DEVOPS FRAMEWORK

- What is DevOps?
- DecOps Agile Culture
- DevOps Lifecycle

Text Books:

1. Cloud Computing Bible by Barrie Sosinsky, 2010
2. Cloud Computing: Concepts, Technology & Architecture by Zaigham Mahmood, Ricardo Puttini, Thomas Erl, 2013

Reference Books:

1. Cloud Computing: Saas, Paas, Iaas, Virtualization, Business Models, Mobile, Security and

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More by Dr Kris Jamsa , 2012

2. Cloud Computing Paperback – 2019
3. by Mehul Mahrishi Kamal Kant/Ruchi Doshi/ Temitayo Fagbola
4. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, 1e Paperback – 2008 by Miller
5. IBM Skills Academy (PDF Provided by IBM)

List of Practical:

- Create an IBM Cloud Account

ACME AIRLINE CLOUD ADOPTION

- Prepare your Environment
- Creating an APP
- Developing an App
- Acme Business Case- Preparing the APP
- Prepare Your Environment
- Creating an App
- Developing an App
- Acme Business Case – Preparing the App

MAINTENANCE CREW CLOUD APP

- Digital App Builder Data Sets
- Cloud Management
- Return to the Digital App Builder
- Preview Dataset in Action

ADD AI TO MAINTENANCE CREW APP

- Create Cloud Cognitive Services
- Connect Services to your App
- Train and Implement Cognitive Services

ADD MULTI-CHANNEL SUPPORT

- Android Studio
- Enabling Android in Digital App Builder
- Preview your APP in Android Device

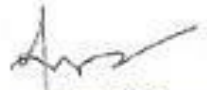
SECURE THE MAINTENANCE CREW APP

- Login Security
- Mobile Phone Authorization
- Test new security functionality

EXPLORE TOOLCHAINS

- Enable Toolchains
- Create and Explore the Garage Method
- Finalize the Creation of Toolchain
- Agile Planning
- Continuous Integration and Delivery
- Manage IBM Cloud Apps
- Manage App Using New Relic & PagerDuty


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SEMESTER III

- Slack and PagerDuty Integration
- Learn from Users

DEVELOP & TEST MICROSERVICES

- Create Microservices Toolchain
- Configure Tool Integrations
- Configure Tool Integrations
- View Build & Deployment Activity
- Manager Access
- Configure Pager Duty
- Submit an Issue
- Modify Code

IDENTIFY AN ERROR

- Fix the Problem and Deploy
- Fix the Problem and Deploy
- Explore the DevOps Insights
- Improve Deployment Management
- Improve Visibility
- Delete Tools and Artifacts

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment#	END SEM University Exam	Teachers Assessment#
BTIBM301	UG	Application Development using Java Programming	2	0	2	3	60	20	20	30	20

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

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

Syllabus:

Course Objectives:

1. To provide an overview of an desktop application development and web application development using Java
2. To introduce the tools and frameworks required to build Java Enterprise Applications.
3. To teach the fundamental techniques and principles in achieving the concepts of Object Oriented Programming.
4. To enable students to have skills that will help them to solve complex real-world problems regarding Web, Desktop and Enterprise Application Development.
5. To study, understand and implement each unit according to National Education Policy 2020 and Bloom's Taxonomy

Course Outcomes:

The syllabus adhere to all Bloom's Taxonomy Levels and has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

1. Understand the vision of Object Oriented Programming from industry context. The CLO has been achieved according to BL1 and BL2 in Unit 1.
2. To understand and apply Object Oriented Programming using Java using java I.D.E. The CLO has been achieved according to BL2 and BL3 in Unit 2.
3. Applying and analyzing multithreading programming of Java Language to create more robust and fast applications. The CLO has been achieved according to BL3 and BL4 in Unit 3.
4. To evaluate the application of Web Server and Application Server and how to deploy Web Applications. The CLO has been achieved according to BL 5 in Unit 4.


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5. Building and creating Web Applications using front end as html, css and java script and backend using Java Servlets and J.S.P(Java Server Pages). Creating projects by establishing database connection with IBM DB2 or MySql. The CLO has been achieved according to BL6 in Unit 5

Syllabus:

UNIT I

INTRODUCTION

Introduction to object-oriented programming, Object concepts, Key principles of object-oriented programming.

UNIT II

INTRODUCTION TO UML AND JAVA PROGRAMMING LANGUAGE

Development project life cycle. Introduction to UML -Static UML Diagrams : Class, Object, Component, Deployment - Dynamic UML Diagrams – Use Case, Sequence, Activity, State Chart. Introduction to the Java programming language. Introduction to the Java development and Productivity tools. Object-oriented programming : Java syntax basics - Part 1 ,Java syntax basics - Part 2 .

UNIT III

CONCEPTS OF CORE JAVA

Writing simple Java code using the IDE, Building classes, Debug applications, Inheritance, Design patterns and refactoring, Interfaces, Collections, Generics, Threads and synchronization, Utility classes, Exceptions and exception handling, I/O and serialization.

UNIT IV

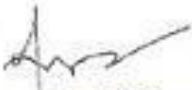
INTRODUCTION TO ENTERPRISE APPLICATION DEVELOPMENT

JavaBeans, Introduction to Java EE Web Component, Overview of Servlets, Java EE Container Services Overview, Servlet API, Overview of JavaServer Pages, JavaServer Pages Specification and Syntax.

UNIT V

ENTERPRISE APPLICATION DEVELOPMENT Create and Edit HTML and JSPs, Debugging Web Applications, Web Archive Deployment Descriptor, Session State Storage Issues, Cookie API, HttpSession: Management of Application Data, URL Rewriting, Best Practices for Session Management, JSP Expression Language, JSP Custom Tags, JSP Tag Files. Create and Edit Servlets, Filters, and Listeners, XDoclet and Annotations, Connecting to a database, Web Application Security, Java EE 12 Packaging and Deployment, Best Practices for Server, Side Application Development , PROJECT


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SEMESTER III

Text Book

1. Effective Java, Author – Joshua Bloch, Latest Edition – 3rd Edition, Publisher – Addison Wesley
2. Java - The Complete Reference, Author – Herbert Schildt, Latest Edition – 11th Edition, Publisher – McGraw Hill Education
3. Java: The Complete Reference by SCHILDT and HERBERT, McGraw Hill

Reference Book

1. Core Java An Integrated Approach (Black Book), Author: Dr. R. Nageswara Rao
2. Thinking in Java, Author: Bruce Eckel

LIST OF PRACTICAL

1. Write a program to create a class Student2 along with two method getData(),printData() to get the value through argument and display the data in printData. Create the two objects s1 ,s2 to declare and access the values from class STtest.
2. WAP using parameterized constructor with two parameters id and name. While creating the objects obj1 and obj2 passed two arguments so that this constructor gets invoked after creation of obj1 and obj2.
3. Write a program in JAVA to demonstrate the method and constructor overloading
4. Write a java program in which you will declare two interface sum and Add inherits these interface through class A1 and display their content.
5. Write a java program in which you will declare an abstract class Vehicle inherits this class from two classes car and truck using the method engine in both display “car has good engine” and “truck has bad engine”.
6. Write a Java Program to finds addition of two matrices.
7. Write a program in java if number is less than 10 and greater than 50 it generate the exception out of range. Else it displays the square of number
8. Write a servlet to connect Java Web application to MySQL/ DB2 Server
9. Create a Login form in Html and validated it on Server Side using Servlet.
10. Create a J.S.P Application to view all data of MySQL/ DB2 table on Web Page.


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Project Statement

Airline Reservation System in Java

This Java project is used to book seats for airlines. There will be a database to store the number of vacant seats, flight details, arrival and departure times, cities, and rates for each flight. As a beginner level project, you can exclude the option of payment processing. But, there should be one dummy model of payment processing and also to cancel the booking.

Online Air Ticket Reservation System in Java

To book tickets for a Airplane from your own place. There will be a local server to host the database of the system. All the details regarding the bus, schedules, arrival and departure time, available seats, the rate will be mentioned and the user has to book the ticket according to his requirements.

Inventory Management System in Java

This is also a core Java project for beginners can be implemented as a minor project to test and implement skills in Java.

This system will manage all the available stocks in a shop or any business organization. We can make purchases, sell and view the current stock. It keeps a track of manufacture, sale, purchase, orders, and delivery of the products by maintaining a database. You can search the product and it will show the status and details of the product on the screen.


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SEMESTER III

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 Lab	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 on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To provide introduction to UNIX Operating System and its File System.
2. To gain an understanding of important aspects related to the SHELL and the process
3. To develop the ability to formulate regular expressions and use them for pattern matching.
4. To provide a comprehensive introduction to SHELL programming, services and utilities.
5. To develop the ability to perform different networking tasks.

Course Outcomes:

On completion of this course:

1. Describe the architecture and features of UNIX Operating System and distinguish it from other Operating System
2. Demonstrate UNIX commands for file handling and process control
3. Write Regular expressions for pattern matching and apply them to various filters for a specific task
4. Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem.
5. Diagnose network using different networking utilities of UNIX.

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



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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 & Regular Expression - Command line arguments: Positional parameters, Set & shift, IFS. Functions & file manipulations: Processing file line by line, Functions. Regular Expression & Filters: 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.

Text Books:

1. Stephen Prata “Advanced UNIX: A Programming's Guide”, BPB Publications, 2017.
2. Maurice J. Bach “Design of UNIX O.S. “, PHI Learning, 2015.
3. Brian W. Kernighan & Robe Pike, “The UNIX Programming Environment”, PHI Learning, 2015.
4. Sumitabha Das: “YOUR UNIX – The Ultimate Guide”, Tata McGraw Hill, 23rdreprint, 2012.
5. Yashavant Kanetkar, “Unix Shell programming”, 1st Edition, BPB Publisher, 2010.

Reference Books:

1. Behrouz A. Forouzan, Richard F. Gilbery, “Unix and Shell Programming”, 1st Edition, Cengage Learning India, 2003.
2. Graham Glass, King Ables, “Unix for programmers and users”, 3rd Edition, Pearson Education, 2009.
3. Sumitabha Das, “Unix Concepts and Applications”, 4th Edition. TMH, 2006.
4. N.B. Venkateswarlu, “Advanced Unix programming”, 2nd Edition, B S Publications, 2010.

List of Practical:

1. Perform installation of UNIX/LINUX operating system.
2. Study of UNIX general purpose utility commands.
3. Execution of various file/directory handling commands.
4. Working with the vi editor: Creating and editing a text file with the vi text editor using the standard vi editor commands.
5. Write a shell script for calculator (to perform basic arithmetic and logical calculations).
6. Write a shell script sum.sh that takes an unspecified number of command line arguments (up to 9) of ints and finds their sum. Modify the code to add a number to the sum only if the number is greater than 10.
7. Write a shell script that will take an input file and remove identical lines (or duplicate lines from the file).
8. Write a shell script takes the name a path (eg: /afs/andrew/course/15/123/handin), and counts all the sub directories (recursively).
9. Shell scripts to explore system variables such as PATH, HOME etc.



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10. Write a shell script that takes a name of a folder as a command line argument, and produce a file that contains the names of all sub folders with size 0 (that is empty sub folders)
11. Execution of various system administrative commands.
12. Write awk script that uses all of its features.
13. Write a shell script to display list of users currently logged in.
14. Write a shell script to delete all the temporary files.
15. Write a shell script to search an element from an array using binary searching.
16. Write shell script to perform different string operations of arrays.

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SEMESTER III

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*
BTIT407	UG	Web Development Lab-II (PHP/JSP)	0	0	4	2	0	0	0	30	20

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

***Teacher Assessment** shall be based on 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 in the students so that they are able to acquire following competencies:

1. Develop interactive web based application using PHP/JSP and MySQL.
2. Effective use of format and design for print documents
3. Design dynamic websites that meet specified needs and interests.

Course Outcomes:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

1. Create small programs using basic PHP concepts.
2. Apply In-Built and Create User defined functions in PHP programming.
3. Design and develop a Web site using form controls for presenting web based content.
4. Debug the Programs by applying concepts and error handling techniques of PHP.
5. Create dynamic Website/ Web based Applications, using PHP, MySQL database.
6. Create dynamic Website/ Web based Applications, using JSP, MySQL database.

Syllabus:

UNIT-I

Introduction to PHP: Identify Relationship Between Apache, Mysql and PHP, Steps to Install and Test Web Server, Configure Apache to Use PHP, Create Simple PHP Page Using PHP Structure and Syntax, Use of PHP Variables, Data Types and PHP Operators, Apply Control Structures in Programming, Steps to Create User Defined Functions.

UNIT-II

Working with in Built Functions: Apply Various Inbuilt variable (Gettype, Settype, Isset, Strval, Floatval, Intval, Print_R), String (Chr, Ord, Strtolower, Strtoupper, Strlen, Ltrim, Rtrim, Trim, Substr, Strcmp, Strcasecmp, Ctrim, Strpos, Strrpos, Strstr, Str_replace, Strrev, Echo, Print), Math (Abs, Ceil, Floor, Round, Fmod, Min, Max, Pow, Sqrt, Rand), Date (Date, Getdate, Setdate, Checkdate, Time, Mktime), Array (Count, List, In_Array, Current, Next, Previous, End, Each, Sort, Array_Merge, Array_Reverse), File Functions (Fopen, Fread, Fwrite, Fclose) in Programming .

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SEMESTER III

Working With Data And Forms: Steps to Create an Input Form (Text Fields, Text Areas, Check Boxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons), Steps to Use Using PHP\$_Get And \$_Post, \$_Request Method for a Given Application, Combining HTML and PHP Codes Together on Single Page, Redirecting the User.

UNIT-IV:

Session, Cookies And Error Handling: Use Cookie to Store and Retrieve Data, Use Querystring to Transfer Data, Create Session Variable and Handle Session, Starting and Destroying Session Working with Session Variables, Passing Session IDs, Handle Runtime Errors Through Exception Handling, Error Types in PHP.

Database Connectivity Using MYSQL: Concepts and Installation Of Mysql, Mysql Structure and Syntax, Types of Mysql Tables and Storage Engines, Mysql Commands, Integration of PHP with Mysql, Connection to the Mysql Database, Creating And Deleting Mysql Database Using PHP, Updating, Inserting, Deleting Records in the Mysql Database, Hosting Website (Using “C” Panel, Using FileZilla Software)

UNIT-V:

Java Server Pages Basics: Integrating Scripts in JSP, JSP Objects and Components, Configuration and Troubleshooting, JSP: Request and Response Objects, Retrieving the Contents of An HTML Form, Retrieving a Query String, Working with Beans, Cookies, Creating and Reading Cookies. Using Application Objects and Event Handling.

Text Books:

1. W. Jason Gilmore, “Beginning PHP and MySQL”, 4th Edition, Apress, 2010
2. Steven Holzner, “PHP: The Complete Reference”, Tata McGraw-Hill, 2008
3. Robin Nixon, “Learning PHP, MySQL, JavaScript, CSS & HTML5”, Third Edition, O’reilly Media, 2014

Reference Books:

1. Julie C. Meloni, “Teach yourself PHP, MySQL and Apache All in one”, 5th Edition, Pearson Education, 2012
2. Phil Hanna, “JSP 2.0: The Complete Reference”, Tata McGrawHill, 2011.

List of Practical’s:

1. Write a PHP script to display Welcome message.
2. Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator.
3. Write PHP Script to print Fibonacci series.
4. Write PHP script to demonstrate Variable function
5. Write PHP script to demonstrate string function.
6. Write PHP script to demonstrate Array functions.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Write two different PHP script to demonstrate passing variables through a URL.
9. Write PHP script to demonstrate passing variables with cookies.



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10. Write an example of Error-handling using exceptions.
11. Write a PHP script to connect MySQL server from your website.
12. Write a program to read customer information like cust_no, cust_name, Item_purchase, and mob_no, from customer table and display all these information in table format on output screen.
13. Write a program to read employee information like emp_no, emp_name, designation and salary from EMP table and display all this information using table format.
14. Create a dynamic web site using PHP and MySQL.
15. Write a program for JSP scriptlet tag that prints the user name
16. Write a program for JSP expression tag that prints current time
17. Write a program for JSP declaration tag that declares method
18. Write a program for JSP for request and response implicit object
19. Write a program for JSP for session implicit object
20. Write a program for JSP for exception implicit object
21. Write a program for JSP for Simple example of java bean class
22. Write a program for JSP for JSP Action Tags

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