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SEMESTER-III

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTCS301N	DCC	Discrete Structures	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

The student will have ability to:

1. 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 (COs):

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

1. Understand the notion of mathematical thinking, mathematical proofs, and algorithmic thinking, and be able to apply them in problem solving.
2. Define sets and perform operations and algebra on sets.
3. Demonstrate an understanding of relations and functions and be able to determine their properties.
4. Analyze logical propositions via truth tables.
5. Write an argument using logical notation and determine if the argument is or is not valid.
6. Understand some basic properties of graphs and related discrete structures and be able to relate these to practical examples.
7. Model problems in Computer Science using graphs and trees.
8. Be able to use effectively algebraic techniques to analyze basic discrete structures and algorithms.

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9. Draw hasse diagram and identify lattice.
10. Understand generating functions and recurrence relation.

Syllabus:

UNIT I **10HRS**

Set Theory

Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), pigeonhole principle. Relation: Definition, types of relation, 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 **9 HRS**

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,proof by using truth table.

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UNIT III **9HRS**

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 **8 HRS**

Algebraic Structure

Binary composition and its properties definition of algebraic structure; Groupoid, Semi group, Monoid Groups, Abelian Group, properties of groups, Permutation Groups, Sub Group, Cyclic Group, Rings and Fields (definition and standard results).

UNIT V **9 HRS**

Posets, Hasse Diagram and Lattices

Introduction, ordered set,well ordered set, Hasse diagram of partially,Lattices, properties of Lattices, bounded and complemented lattices.Generating functions, Solution by method of generating functions.Recurrence Relation and Generating Function: Introduction to Recurrence Relation, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions.

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

Text Books:

1. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill, 8th Edition, 2021.
2. Seymour Lipschutz, M.Lipson, "Discrete Mathemataics" Tata McGraw Hill, 4thEdition, 2021.
3. C.L.Liu,D. P. Mohapatra "Elements of Discrete Mathematics" Tata McGraw-Hill Edition, 4th Edition, 2017

References:

1. Trembley, J.P &Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill, 1st Edition, 2017
2. Biswal,"Discrete Mathematics & Graph Theory", PHI, 4thEdition, 2015.

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BTCS302N	DCC	Analysis and Design of Algorithms	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

The student will have ability to:
COURSE OBJECTIVE

1. To learn the algorithm analysis techniques.
2. To critically analyze the efficiency of alternative algorithmic solutions for the same problem
3. To understand the limitation of algorithm power.
4. To understand different algorithm design techniques.

Course Outcomes (COs):

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

The students will be able to

1. Define the basic concepts of algorithms and analyze the performance of algorithms.
2. Explain different standard algorithm design techniques, namely, divide & conquer,
3. Greedy, dynamic programming, backtracking and branch & bound.
4. Demonstrate standard algorithms for fundamental problems in Computer Science.
5. Design algorithms for a given problem using standard algorithm design techniques.
6. Analyze and compare the efficiency of various algorithms of a given problem.
7. Identify the limitations of algorithms in problem solving.
8. To identify the types of problem, formulate, analyze and compare the efficiency of Algorithms.

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Syllabus:

UNIT I **10HRS**

Algorithms Designing: Algorithms, Analyzing Algorithms, Asymptotic Notations, Heap Sort, 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 **9HRS**

Greedy Method: General Method, fractionalKnapsack Problem, Job Sequencing with Deadlines, Minimum-Cost Spanning Tree - Prim's and Kruskal's algorithm, Single Source Shortest Paths.

UNIT III **8HRS**

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

UNIT IV **7HRS**

Backtracking: General Method, 8-Queens Problem, Graph Coloring, Hamiltonian Cycles, Sum of Subsets.

Branch and Bound: GeneralMethod, O/1 Knapsack Problem, Traveling Salesperson Problem.

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UNIT V **8HRS**

NP Hard and NP Complete Problems: Basic Concepts, Cook's Theorem, NP Hard Graph and NP Scheduling Problems, Some Simplified NP Hard Problems.

Text Books:

1. Ellis Horowitz and Sartaj Sahni, "Fundamental of Computer Algorithms", 2nd Edition, Galgotia Publication, 2001.

References:

1. Thomas H Cormen, Charles E Leiserson and Ronald L Rivest "Introduction to Algorithms",3rd Edition, MIT Press. 2009.
2. Donal E Knuth, "Fundamentals of Algorithms: The Art of Computer Programming" Vol l,3rd Edition, Pearson Educatio, 1997.
3. Goodman, S.E. &Hedetnieni,"Introduction to Design and Analysis of Algorithm", Tata McGraw Hill, 1977.
4. S. Dasgupta, C. H. Papadimitriou, and U. V. Vazirani,"Algorithms",Tata McGraw Hill, 2006.
5. J.E Hopcroft, J.D Ullman, "Design and analysis of algorithms" TMH Publication.

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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.

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BTIBMC401N	**DCC**	**Cloud Application Developer**	**60**	**20**	**20**	**30**	**20**	**3**	**1**	**2**	**5**

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Course Educational Objectives (CEOs):

1. Introduction to cloud computing and platforms on Cloud
2. Understand Business Problems and evolution of IBM cloud
3. Introduced to Cloud Architecture
4. Understanding Cloud Foundry and resources
5. Introduced to weather insights on IBM cloud
6. Working on Chatbot using Watson services
7. Understanding DevOps and its lifecycle
8. Introduced to nodes used in Cloud application development

Course Outcomes (COs):

1. Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
2. Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
3. Explain the core issues of cloud computing such as security, privacy, and interoperability.
4. Choose the appropriate technologies, algorithms, and approaches for the related issues.
5. Identify problems, and explain, analyze, and evaluate various cloud computing solutions.
6. Provide the appropriate cloud computing solutions and recommendations according to the applications used.
7. Attempt to generate new ideas and innovations in cloud computing.

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BTIBMC401N	**DCC**	**Cloud Application Developer**	**60**	**20**	**20**	**30**	**20**	**3**	**1**	**2**	**5**

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Syllabus:

Unit I: Introduction to Cloud Computing **7 HRS**

Traditional way of working in IT, Traditional IT Challenges, Future Trend in IT, What is Cloud Computing Cloud Characteristics, service and Delivery models, Cloud Computing helps overcome IT challenges, Traditional On-premises Core IT, Cloud Service, IBM Cloud – IAAS, PAAS and SAAS,IBM cloud Infrastructure (Iaas) Offerings,IBM Cloud Platform as a service offerings, Cloud Delivery models,Private Cloud,Public Cloud

Unit II: Deep Dive in to IBM Cloud **8 HRS**

What is IBM Cloud,Evolution of IBM Cloud,Business Problems,Developer Problems,Why IBM Cloud Speed – Time to Value,Predictability – Reduced Risk and Cost,Agility,IBM Cloud UI tour,IBM Cloud Login IBM cloud UI Dashboard,IBM Cloud Region,Organizations, spaces, users and domains,Organizations Spaces.Quota,User Management,Monitoring and Logs,IBM Cloud Catalog,Containers,IBM containers on IBM Cloud,IBM Cloud Container Advantages and Differentiators Services,IBM cloud value to developers

Unit III: IBM Cloud Architecture **10 HRS**

Is IBM cloud a cloud foundry,How cloud foundry works,How the cloud balances its load,how apps runanywhere,How CF organizes Users and workspaces,Where CF stores Resources,How CF componentscommunicate,How to monitor and analyze a CF deployment,Using services with CF,What is cloud foundry,Cloud foundry languages, frameworks and services,Cloud foundry architecture – high level,Cloud foundry architecture – CF kernel internal,description of each of the components,Cloud controller and diego brain nsync, BBS and Cell reps,App storage and execution,Diego Cellmessaging,metrics and logging,Cloud foundry – application staging,Various IBM cloud architecture,IBM cloud dedicated architecture,Cloud foundry command line interface, Important CF CLI Calls,Cloud foundry tools

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Unit IV: IBM Cloud Services 10 HRS

IBM cloud services,Analytics Services,Types of data services available in IBM Cloud,Cloud API feature,Watson Services,Storage,DevOps,Auto scaling, vertical scaling and horizontal scaling,Adding a service to application,Requesting a new service instance,Configuring your application to interact with a service,VCAP services,service Metadata,IBM cloud user provided service instance – service metadata IBM cloud user provided service instance – user interface service metadata

Unit V: Nodes Creation 7 HRS

What is IBM cloud DevOps Services,Tool chain overview,Code and eclipse orion web IDE,Git Repos and Issue tracking,Delivery pipeline,Stages, jobs,Installing Node.js windows build tools,Running Node RED,Node RED architecture,Creating nodes RED flow,Types of Nodes and functions,Inject and DebugNode,Change Node.

Textbooks:

1. Cloud Computing Bible by Barrie Sosinsky,Wiley
2. Cloud Computing: Concepts, Technology & Architecture by Zaigham Mahmood, Ricardo Puttini, Thomas Erl, The Prentice Hall Service

References:

1. Cloud Computing: Saas, Paas, Iaas, Virtualization, Business Models, Mobile, Security and More Paperback – 2012 by Dr Kris Jamsa Kris Jamsa, Jones & Bartlett;
2. Cloud Computing Paperback – 2019 by Mehul Mahrishi Kamal Kant/Ruchi Doshi/ Temitayo Fagbola, BPB Publications
3. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, 1e Paperback – 2008 by Miller, Pearson

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List of Practical:

1. Write a program to print the simple “hello world” using node.js while using node.js command prompt.
2. Write a program to perform read, write operation using file system module in node.js.
3. Create a package.json file with the help of command prompt.
4. Write the steps to create a server in node.js.
5. Write the steps to connect a node.js application with database.
6. Upload the file on local server using node.js.
7. Send email from your account to other account using node.js.
8. Json parsing using node.js.
9. Form submission using node.js.
10. Perform Event handling using node.js.

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BTIBM301N	**UG**	**Application Development using Java Programming**	**60**	**20**	**20**	**30**	**20**	**3**	**1**	**2**	**5**

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Course Educational Objectives (CEOs):

The student will have ability to:

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 (COs):

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

The students will be able to

1. Understand the 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.

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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.
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 **8 HRS**

INTRODUCTION

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

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UNIT II **8 HRS**

INTRODUCTION TO UML AND JAVA PROGRAMMING LANGAUGE

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 **8 HRS**

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 **8 HRS**

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.

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIBM301N	DCC	Application Development using Java Programming	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT V **8 HRS**

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

Text Books:

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

References:

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

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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.

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BTIBM301N	DCC	Application Development using Java Programming	60	20	20	30	20	3	1	2	5

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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 MySQLl/ 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.

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, fight 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.

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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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BTDSE311N	DSE	Information Theory and Coding	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

The student will have ability to:

1. Students should be able to calculate the information content of a random variable from its probability distribution relate condition and marginal entropies of variables interims of their coupled probabilities.
2. Channel capacities and properties using Shannon's Theorems construct efficient client codes for data on imperfect communication channels generalize the discrete concepts to continuous signals on continuous channels understand.

Course Outcomes (COs):

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

The students will be able to

1. Students will be introduced to the basic notions of information and channel capacity.
2. Derive equations for entropy mutual information and channel capacity for all types of channels.
3. Design a digital communication system by selecting an appropriate error correcting codes for a particular application.

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BTDSE311N	DSE	Information Theory and Coding	60	20	20	0	0	3	0	0	3

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Syllabus:

UNIT I **9HRS**

Introduction of Information Theory: Introduction, Measure of information, Average information content of symbols in long independent sequences, Average information content of symbols in long dependent sequences. Mark off statistical model for information source, Entropy and information rate of mark off source.

UNIT II **9HRS**

Source Coding: Encoding of the source output, Shannon‟s encoding algorithm. Communication Channels, Discrete communication channels, Continuous channels.

Fundamental Limits on Performance: Source coding theorem, Huffman coding, Discrete memory less Channels, Mutual information, Channel Capacity.

UNIT III **9HRS**

Channel: Channel coding theorem, Differential entropy and mutual information for continuous ensembles, Channel capacity Theorem Introduction.

Introduction to Error Control Coding: Types of errors, examples, Types of codes Linear Block Codes: Matrix description, Error detection and correction, Standard arrays and table look up for decoding.

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BTDSE311N	DSE	Information Theory and Coding	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV **8HRS**

Cyclic Codes: Binary Cycle Codes, Algebraic structures of cyclic codes, Encoding using an (n-k) bit shift register, Syndrome calculation. BCH codes. RS codes, Golay codes, Shortened cyclic codes, Burst error correcting codes. Burst and Random Error correcting codes.

UNIT V **7HRS**

Convolution Codes: Convolution Codes, Time domain approach. Transform domain approach.

Text Books:

1. Information Theory, Coding and Cryptography, Ranjan Bose, TMH, III edition, 2017

References:

1. Digital Communications Glover and Grant, Pearson Ed. 2nd Ed 2008.
2. Information Theory and Coding, K. N. Hari Bhat, D. Ganesh Rao, Cengage, 2017.
3. Digital and analog communication systems, K. Sam Shanmugam, Wiley,1996.
4. Digital communication, Simon Haykin, Wiley, 2003.

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BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

The student will have ability to:

1. Understanding the fundamental concepts of E-Commerce.
2. Understand structured E-Payment Systems.
3. Understand e-Readiness & Ecommerce Security.
4. Knowledge of basic Security of E-Commerce.
5. Understand E-Governance& Models.

Course Outcomes (COs):

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

The students will be able to:

1. Students will understand basics E-Commerce & E-Governance.
2. Students would be able to analyze the concept of electronic market and market place
3. Students will understand e-Readiness&Ecommerce Security.
4. Understand the e-business concepts, models and infrastructure.
5. Willcome up with online business ideas and will be motivated to apply what they learned
6. Students would be able to understand the legal and security issues.
7. Learn how e-business concepts are applied to different fields, such as: education, banking, tourism etc.

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BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

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

UNIT I **10HRS**

Introduction To E-Commerce: The Scope of E-Commerce, Commercial Use Of The Internet, Emergence of World Wide Web, Electronic Data Exchange-Business, E-Commerce In India, E-Commerce Opportunities For Industries, B2C,B2B,C2C,C2B Models, Advantages and Disadvantages of E-Commerce.

UNIT II **9HRS**

Electronic Payments Overview of Electronics payments, Overview, The SET protocol, Payment Gateway, Digital Token based Electronics payment System, magnetic strip card, E-Checks, Smart Cards, Credit Card, Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

UNIT III **8HRS**

E-readiness, e-government readiness, e-Framework, step & issues, application of data warehousing and data mining in e-government, e-Advertising Techniques: Banners, Sponsorships, Portals, Online Coupons, Case studies: NICNET-role of nationwide networking in e-governance, E-seva

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BTDSE312N	DSE	Essentials of E - Commerce	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT IV **7HRS**

E-Commerce Security: Security on the internet, E-commerce security issues, Cryptography, Digital Signature & Authentication protocol, Digital Certificates. Online Security Challenges and approach to e-government security, security for server computers, communication channel security, security for client computers. Information security environment in India.

UNIT V **8HRS**

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

Text Books:

2. V. Rajaraman, “Essentials of E-Commerce Technology”, PHI Learning Private Limited
3. C.S.R. Prabhu, “E-governence: concept and case study”, PHI Learning Private Limited.

References:.

1. Gary P. Schneider, “E-commerce”, Cengage Learning India. 9th Edition
2. Hanson and Kalyanam, “E-Commerce and Web Marketing”, Cengage Learning.
3. P.T. Joseph, “E-Commerce An Indian Perspective”, PHI Learning Private Limited.
4. J. Satyanarayan, “E-government: The science of the possible”, PHI Learning Private Limited.
5. David Whiteley, “E-commerce study, technology and applications”, TMH.

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BTDSE313N	DSE	**Modern Computing Hardware**	60	20	20	0	0	3	0	0	3

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Course Educational Objectives (CEOs):

1. To learn the concept of memory and its types along with HDD/SDD.
2. To learn the input/output components presents on the motherboard.
3. To learn different modes of power supply to the PC and it's troubleshooting.
4. To learn the concept of BIOS.
5. To learn the device drivers and peripherals attached to the PC board.

Course Outcomes (COs):

Upon completion of the course, students will be able:

1. To understand the hierarchy of the Memory used for PC and its applications.
2. To understand the use and working of I/O components.
3. To understand the principles behind the power supply and its usage.
4. To understand the BIOS concept and its configuration.
5. To understand the use and requirement of peripherals and their device drivers.

Syllabus:

UNIT I **8 HRS**

Hardware Organization : Motherboards, Chipset and Controllers, Types of processors (Intel Core i3/ i5 /i7 /i9 & AMD) and their compatibility with motherboards, USB Ports, HDMI, DVI, Interconnection between units, Graphic cards**.**

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BTDSE313N	DSE	**Modern Computing Hardware**	60	20	20	0	0	3	0	0	3

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UNIT II **6HRS**

Memory& Storage Devices: Introduction to memory, classification of Memory and its use, Overview Memory chips and Modules, and its working principle and Trouble shooting of Memory. DVD & Blue-Ray Disk, Hard Disk Drives, Solid-State Drives, USB Flash Drives.

UNIT III **4 HRS**

Power Supply: Working of SMPS, On-Line/Off-Line/Line-Interactive/uninterrupted power supplies (UPS), CMOS, Lithium-ion battery, basic principle of working their importance and maintenance.

UNIT IV **4 HRS**

Basic Input/output System: Concept of BIOS. Function of BIOS, software interrupts, testing and initialization, configuring the system.

UNIT V **6 HRS**

Peripherals & Device Drivers: Input devices: Wireless Keyboard & Mouse, Light-Pen, Touch Screen, HD web camera, Barcode Reader, Output devices: Touch Screen Monitor, 3D Printer, Projector, Software drivers for various devices and their role**.**

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BTDSE313N	DSE	Modern Computing Hardware	60	20	20	0	0	3	0	0	3

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Text Books:

1. Craig Zacker & John Rourtre, PC Hardware- The complete reference, First Edition, TMH, 2017

2. Mike Meyers, Introduction to PC Hardware and Troubleshooting, 1st edition, McGraw Hill Education, 2017

References:

1. Stephen Bigelow, Bigelow's Troubleshooting, Maintaining & Repairing PCs, 5 edition, McGraw Hill Education, 2017
2. Vikas Gupta, Comdex Hardware and Networking Course Kit: Revised & Upgraded, Dreamtech Press, 2014
3. Dan Gookin, Troubleshooting and Maintaining Your PC All–in–One For Dummies, 3rd edition, John Wiley & Sons, 2017
4. Robert Bruce Thompson, Barbara Fritchman Thompson, Building the Perfect PC, 3 edition, O′Reilly, 2010
5. B. Govindarajalu, IBM PC and CLONES: Hardware, Troubleshooting and Maintenance McGraw Hill Education, 2nd Edition 2002.

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BTIT408N	DCC	Unix Programming Lab	0	0	0	30	20	0	0	2	1

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Course Educational Objectives (CEOs):

The student will have ability to:

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

Course Outcomes (COs):

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

The students will be able to

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

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BTIT408N	DCC	Unix Programming Lab	0	0	0	30	20	0	0	2	1

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Syllabus:

UNIT I: **10HRS**

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, pwd, cd, mkdir, rmdir.

UNIT II: **9 HRS**

Handling Files - The File System,touch, cat, cp, rm, mv, more, file, ls, wc, pg, comm, gzip, tar, zip, df, du, The vi editor.
Security by file Permissions: chmod, umask .
Networking commands: ping, telnet, ftp, finger, arp, rlogin.

UNIT III: **8 HRS**

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: **7HRS**

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

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Choice Based Credit System (CBCS) in Light of NEP-2020
B.Tech. (CSE-Big Data Analytics/Cloud and Mobile Computing/Artificial Intelligence/Data Science/Full Stack Development & Block chain-IBM) Choice Based Credit System (CBCS)-2021-25
SEMESTER-III

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTIT408N	DCC	Unix Programming Lab	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT V: 8**HRS**

SED and AWK - SED: Scripts, Operation, Addresses, commands, Applications.
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 .

Text Books:

1. Sumitabha Das: "YOUR UNIX – The Ultimate Guide", Tata McGraw Hill.

References:

1. Behrouz A. Forouzan, Richard F. Gilbery, "Unix and Shell Programming",Cengage Learning India.
2. Graham Glass, King Ables, "Unix for programmers and users", Pearson Education.
3. N.B. Venkateswarlu, "Advanced Unix programming", B S Publications.
4. Yashavant Kanetkar, "Unix Shell programming", 1st Edition, BPB Publisher.
5. Stephen Prata "Advanced UNIX: A Programming's Guide", BPB Publications.
6. Maurice J. Bach "Design of UNIX O.S. ", PHI Learning.
7. Brian W. Kernighan & Robe Pike, "The UNIX Programming Environment", PHI Learning.

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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 that will take an input file and remove identical lines (or duplicate lines from the file).
7. Shell scripts to explore system variables such as PATH, HOME etc.
8. Execution of various system administrative commands.
9. Write awk script that uses all of its features.
10. Write a shell script to display list of users currently logged in.
11. Write a shell script to delete all the temporary files.
12. Write shell script to perform different string operations of arrays.

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BTIT409N	DCC	Scripting Languages	0	0	0	30	20	0	0	2	1

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Course Educational Objectives (CEOs):

The student will have ability to:

1. To understand different types of scripting languages.
2. To gain knowledge about client side scripts and server side scripting.
3. To learn about PHP, PERL and Python languages and their usage in implementation.
4. To build web application project using scripting languages.

Course Outcomes (COs):

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

The students will be able to

1. Student will be Able to understand difference between scripting languages.
2. Student will be able to create programs using functions, control structures.
3. Student will learn implementation of scripting languages on different tools
4. Student can apply knowledge of scripting languages for creating a web application project using scripting languages implementation.

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Syllabus:

Unit I **10HRS**

Introduction of scripting languages, need of scripting, characteristics of scripting languages, uses of scripting languages, Introduction of client side scripting languages like JavaScript, VBScript, HTML5 (Structure), CSS3 (Designing), AJAX, jQuery, Server side scripting languages like PHP, ASP.NET (C# OR Visual Basic), C++ , Java and JSP, Python, Ruby on Rails.

Unit II **9HRS**

PHP basic features, Embedding php code in your web pages, outputting the data to the browser, data types, variables, constants, expressions, string interpolation, control structure, function, creating a function, function library, Arrays, String & regular expression, Web forms, Files, Authentication, Uploading file with PHP, sending email using PHP.

Unit-III **8HRS**

Python: Introduction to python languages, python syntax, statements, functions, build-in functions, methods, module in python, exception handling, integrated web application in python- Building small, efficient python web system, web application framework.

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Unit-IV **7HRS**

Introduction to Perl and scripting, scripts, programs, Web scripting and PERL names , values, variable, scalar expression, control structures, arrays, list, hashes, strings, patterns, and regular expression, subroutine.

Unit-V **8HRS**

Introduction of Angular JS, Industrial usage of angular JS.benefits of Angular JS, Creation of Web application project using database, scripting, HTML, & CSS.

Text Books:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3" Edition, Jason Gilmore, Apress Publications (Dream tech.).

References:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Pen and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,l.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Pen by Example, E.Quigley, Pearson Education.

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8. Programming Perl,Larry Wall, T.Christiansen and J.Orwant,O'Reilly, SPD.
9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice HalI(Pearson).

List of Practical:

1. Javascript program to generate Fibonacci series and to look for motifs and patterns in sequences.
2. Javascript program to find out frequency of characters existing in nucleotide and protein sequences 6 Javascript's implementation to generate dynamic HTML pages.
3. Write PHP programs to do basic operations to deal with strings, and arrays, and to implement various mathematical functions.
4. Development of an PHP program to take set of sequences and find out conserved sequences.
5. Create a MySQL database tables and execute all SQL queries.
6. Write a PHP program to connect MySQL database and execute all SQL commands.
7. Construct a PHP interface for a given Web page and to produce its overall connectivity.
8. Implement database and server site connectivity all together to generate complete dynamic web based applications through PHP, HTML and MySQL.
9. Write programs in Perl to implement string handling and other functions to be implemented to deal with biological data management.
10. Write PHP programs to do basic server side programming.