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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 *				
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.
*Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall 2exceed more than 10 marks.

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

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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.

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.

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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, Subgroup, 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.

Text Book:

1. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill, 8th Edition, 2021.

References:

1. Trembley, J.P &Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill, 1st Edition, 2017
2. Biswal,"Discrete Mathematics & Graph Theory", PHI, 4th Edition, 2015.
3. Seymour Lipschutz, M.Lipson, "Discrete Mathemataics" Tata McGraw Hill, 4thEdition, 2021.
4. C.L.Liu,D. P.Mohapatra "Elements of Discrete Mathematics" Tata McGraw-Hill Edition, 4th Edition, 2017

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Course Educational Objectives (CEOs):

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 (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. 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 **10HRS**

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

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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 **9HRS**

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.

UNIT III 8**HRS**

Stack: The Stack as an ADT, Stack operation, Array Representation of Stack, Link Representation of Stack, Application of stack – Recursion, Polish Notation. Types of Recursions, 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 **7HRS**

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.

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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 8**HRS**

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 Book:

1. Ashok N. Kamthane, "Introduction to Data structures", 2nd Edition, Pearson Education India,2011.

References:

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.
6. Tremblay & Sorenson, "Introduction to Data- Structure with applications", 8th Edition, Tata McGrawHill,2011.
7. Bhagat Singh & Thomas Naps, "Introduction to Data structure", 2nd Edition, Tata Mc- GrawHill 2009.
8. Robert Kruse, "Data Structures and Program Design",2nd Edition,PHI,1997.
9. Lipschutz Seymour,"Data structures with C" ,1st Edition ,Mc- GrawHill,2017.

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Suggested List of Experiments: -

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 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. Write a program for implementation of Bubble sort.
11. Write a program for Insertion sort.
12. Write a program for Merge Sort
13. Write a program to implement Heap sort.
14. Write a program to implement Quick sort
15. Write a program to Construct a Binary Search Tree and perform deletion, inorder traversal on it
16. Write a program to develop an algorithm for binary tree operations and implement the same.
17. Write a program to design an algorithm for sequential search, implement and test it.
18. Write a program to develop an algorithm for binary search and perform the same.

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Course Educational Objectives (CEOs):

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 (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. 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.

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Syllabus:

UNIT I **10HRS**

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, System Calls/Monitor Calls, Firmware- BIOS, Boot Strap Loader. Threads- processes versus threads, threading, concepts, models, kernel & user level threads, thread usage, benefits.

UNIT II **9HRS**

Process Management: Process Model, Creation, Termination, States & Transitions, Context Switching, Process Control Block, 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 **8HRS**

Interprocess Communication: Introduction to Message Passing, Race Condition, Critical Section Problem, Peterson's Solution, Semaphore, Classical Problems of Synchronization Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem. **Deadlock-** System model, Resource types, Deadlock Problem, Deadlock Characterization, Methods for Deadlock Handling, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock Detection, Recovery from Deadlock.

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UNIT IV **7HRS**

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, memory allocation schemes- first fit, next fit, best fit, worst fit and quick fit.

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 **8HRS**

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.

Textbook:

1. Abraham Silberschatz,"Operating system concepts",10th Edition,John Willey & Sons. INC, 2018

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Reference Books:

1. Achyut S Godbole,"Operating System",3rd TMH,2017.
2. William Stalling, "operating system" 8th, Pearson Education, ,2014.
3. Vijay Shukla, "Operating System", 3rd, Kataria &Sons ,2013.
4. Singhal & Shivratri,"Advanced Concept in Operating Systems", 1st, TataMc-Graw Hill Education, edition 2017.
5. Andrew S.Tannanbaum, "Modern operating system", 4th Edition,Pearson Education, 2014
6. Dhananjay M. Dhamdhere, "Operating Systems:A concept Based Approach", 3rd Edition TMH, 2017.
7. Sibsankar Haldar, Alex AlagarsamyAravind," Operating System", 8th Edition, Pearson Education India,, 2010

Suggested List of Experiments: -

1. Implement and update the BIOS settings of your PC.
2. If there are 5 printers are connected in a system each process to print will take different time to complete, and CPU will give a fixed time to each process after that deadline next process will enter in CPU. If a problem not completed in a given slot then that process will be reenter as per the FCFS, on rotation basis? Apply the scheduling on this?
3. Implement Non-Preemptive Priority CPU Scheduling.
4. Implement Non-Preemptive Shortest Job first CPU Scheduling.
5. If there are 5 different resources like 3 printer,2 scanner is connected to a system each taking different time to complete the task. Which scheduling is best and gives best performance of CPU?
6. Implement the scheduling for that where CPU give chance to complete those process first which comes first?

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7. Implement Round-Robin CPU scheduling.
8. Write a program to implement Semaphore.
9. Find the solution for the situation where 5 faculties are sitting in a round table. There are 4 ball pens are placed on this table. At a time only one pen can be picked by one faculty to writing work. What would happen if all picked the pen for writing simultaneously?
10. Find the solution for dentist checkup clinic where only one chair and one dentist are available for treatment. And having n chairs to waiting for patient.
    - If there is no patient, then the doctor sleeps in his own chair.
    - When a patient arrives, he must wake up the doctor.
    - If there are many patients and the doctor is doing treatment of him, then the remaining patients either wait if there are empty chairs in the waiting room or they leave if no chairs are empty.
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 Shortest Seek Time First Disk Scheduling Algorithm.
14. Implement Scan Scheduling Disk Scheduling Algorithm.
15. Implement Circular Scan Disk Scheduling Algorithm.
16. Implement Look Disk Scheduling Algorithm.

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BTCS402N	DSE	Software Engineering and Project Management	60	20	20	30	20	2	0	2	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. Get the knowledge of basic software engineering methods and practices.
2. Define software requirements and requirement engineering.
3. Apply approaches for various design and their principle.
4. Explore testing in various domain.
5. Development of significant teamwork and project-based experience.

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. Compare various software process models and identify where these models are applicable.
2. Define and analyze software project management, the framework and the dimensions of software project management.
3. Comprehend System modeling using UML.
4. Identify software testing strategies by using testing tools.
5. Analyze software risks and risk management strategies.

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BTCS402N	DSE	Software Engineering and Project Management	60	20	20	30	20	2	0	2	3

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Syllabus:

UNIT I **10HRS**

Introduction to Software Engineering: The evolving role of software, changing nature of software, software myths.

A Generic view of process: Software engineering- a layered technology, a process framework, the capability maturity model integration (CMMI), process patterns, process assessment, personal and team process models.

Process models: The waterfall model, incremental process models, evolutionary process models, the unified process. Agile development-Agile Process, Extreme Programming

UNIT II **9HRS**

Software Requirements: Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

System models: Context models, behavioral models, data models, object models, structured methods.

UNIT III 8**HRS**

Design Engineering: Design Process- Design concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements

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BTCS402N	DSE	Software Engineering and Project Management	60	20	20	30	20	2	0	2	3

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Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, Use Case Diagrams, Class Diagrams, Interaction Diagrams, State chart Diagrams, Activity Diagrams, Package Diagrams, Component Diagrams, Deployment Diagrams

UNIT IV **7HRS**

SOFTWARE IMPLEMENTATION: - Structured coding Techniques, Coding Styles, Standards and Guidelines, Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction-Exception Handling- Concurrency Mechanism.

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, Object oriented software, Web
Apps-validation testing, system testing, the art of debugging.

UNIT V **8HRS**

Metrics for Process and Products: Software measurement, metrics for software quality. Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality
standards.

Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.

MAINTENANCE: Software Maintenance-Software Supportability- Reengineering- Business Process Reengineering- Software Reengineering- Reverse Engineering- Restructuring- Forward Engineering- Economics of Reengineering

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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.

Textbook:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.

References:

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The Mc Graw-Hill Companies.
3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.
4. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning.
5. Software Engineering- Sommerville, 7th edition, Pearson Education.
6. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.
7. Pankaj Jalote ,"An Integrated Approach to Software Engineering", Narosa Pub, 2005.
8. Richard H.Thayer,"SoftwareEnginerring& Project Managements",Willey India

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Suggested List of Experiments: -

1. Study and compare the SDLC models.
2. Prepare a SRS document in line with the IEEE recommended standards.
3. Study Requirement Engineering of project.
4. Study the UML drawing tools.
5. Draw the Entity relationship diagram of a project.
6. Draw the data flow diagrams at level 0 and level 1.
7. Draw use case diagram in argo UML.
8. Draw activity diagram in argo UML.
9. Draw class diagram in argo UML.
10. Draw the component diagram in argo UML.
11. Draw sequence diagram in argo UML.
12. Draw collaboration diagram in argo uml.
13. Use testing tool such as junit.
14. Using configuration management tool-libra.

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BTIBMC401N	**DSE**	**Cloud Application Developer**	60	20	20	30	20	2	0	2	3

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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	**DSE**	**Cloud Application Developer**	60	20	20	30	20	2	0	2	3

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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 into 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 run anywhere, How CF organizes Users and workspaces, Where CF stores Resources, How CF components communicate, 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 Cell messaging, 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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BTIBMC401N	**DSE**	**Cloud Application Developer**	60	20	20	30	20	2	0	2	3

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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 Debug Node, Change Node.

Textbook:

1. 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
4. Cloud Computing Bible by Barrie Sosinsky,Wiley

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BTIBMC401N	**DSE**	**Cloud Application Developer**	60	20	20	30	20	2	0	2	3

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Suggested List of Experiments:

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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BTIT307N	SEC	Introduction to core JAVA	0	0	0	30	20	0	0	2	1

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Course Educational Objectives (CEOs):

The student will have ability to:

1. Understand Java Environment for application development.
2. Understand Programing using Object Oriented Technology.
3. Develop computer program to solve specific problems with high performance.
4. Create debug and run java standalone applications.
5. Understand the concept of Exception handling and Multithreading.

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. Design new applications using object oriented methodologies.
2. Explore various system libraries.
3. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
4. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes..
5. Design Data base connectivity program for simple problems.

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BTIT307N	SEC	Introduction to core JAVA	0	0	0	30	20	0	0	2	1

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Syllabus:

UNIT I **12HRS**

Introduction to Java: Java's magic, The Byte code,Java Development Kit (JDK), Java Buzzwords, Object oriented programming, Simple Java programs, Data types, variables and arrays, Operators, Control Statements.

UNIT II 8**HRS**

Classes, Inheritance, Packages and Interfaces: Classes: Classes fundamentals,Declaring objects, Constructors, this keyword, garbage collection. Inheritance: inheritance basics, using super, creating multi level hierarchy, method overriding.Packages, Access Protection, Importing Packages, Interfaces.

UNIT III **7HRS**

Exceptions handling and Multi threading: Exception , Exceptions and Errors ,Types of Exception, Control Flow in Exceptions, Use of Try, Catch, Finally, Throw, Throws in Exception Handling, In-Built and User Defined Exceptions,Checked and Un Checked Exceptions.

UNIT IV 8HRS

Understanding Threads, Needs of Multi-Threaded Programming, Thread Life Cycle, Thread Priorities ,Synchronizing Threads,

UNIT V8HRS

The Java Library: String Handling, Exploring Java.Lang, Java.Util – The Collection Framework, Exploring Java.IO.

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Text Books:

1. E. Balagurusamy, “Programming with java A Primer”, Fourth Edition, Tata McGraw Hill, 2009

References:

2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
3. Introduction to Java programming, By Y.DanielLiang,Pearson Publication.
4. SouravSahay, Object Oriented Programming with C++, Oxford University Press,2006
5. Herbert Schildt, “The Complete Reference Java”, Ninth Edition, McGraw Hill, 2014
6. Bert Bates, Kathy Sierra, “Head First Java”, 2nd Edition, O’ Reilly, 2005

Suggested List of Experiments: -

1. Write a program to show concept of Class in Java.
2. Write a program showing Type Casting
3. Write a program showing Different type of inheritance.
4. Write a program showing Different types of Polymorphism.
5. Write a program showing Encapsulation.
6. Write a program showing Abstraction.
7. Write a program showing interface.
8. Write a program showing abstract class.
9. Write a program showing inner class.
10. Write a Multithreaded program.
11. Write a program showing Checked and Unchecked Exception.

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