ShriVaishnavVidyapeethVishwavidyalaya, Indore

ShriVaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech CSE(Machine Learning & Cloud Computing in association with Google Cloud)

SEMESTER-III(2024-2028)

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 exceed more than 10 marks.

COURSE OBJECTIVES:

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:

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. 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.

SYLLABUS

UNIT I — 10 HOURS

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.

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UNIT II **9 HOURS**

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 **9 HOURS**

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 HOURS**

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 HOURS**

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.

TEXTBOOKS:

1. Kenneth H. Rosen, *Discrete Mathematics and its applications*, McGraw Hill, 8th Ed., 2021.
2. Trembley J.P & Manohar, *Discrete Mathematical Structure with Application CS*, McGraw Hill, 1st Ed., 2017.

REFERENCE:

1. Biswal, *Discrete Mathematics & Graph Theory*, PHI, 4th Ed., 2015.
2. Seymour Lipschutz, M.Lipson, *Discrete Mathemataics*, Tata McGraw Hill, 4th Ed., 2021.
3. C. L. Liu, D. P. Mohapatra, *Elements of Discrete Mathematics*, Tata McGraw-Hill Edition, 4th Ed., 2017.

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BTCS306M	DCC	**Fundamentals of Data Structures**	60	20	20	30	20	3	0	2	**4**

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Chairperson	Chairperson	Controller of Examination	Registrar
Board of Studies, ShriVaishnavVidyapeethVishwavidyalaya, Indore	Faculty of Studies, ShriVaishnavVidyapeethVishwavidyalaya, Indore	ShriVaishnavVidyapeethVishwavidyalaya, Indore	ShriVaishnavVidyapeethVishwavidyalaya, Indore

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COURSE OBJECTIVES:

The student will have ability to:

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 completion of the subject, 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 — 10 HOURS

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 — 9 HOURS

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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UNIT III **8 HOURS**

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 **7 HOURS**

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 **8 HOURS**

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.

TEXTBOOKS:

1. Ashok N. Kamthane, *Introduction to Data structures*, 2nd Ed., Pearson Education India,2011.
2. Tremblay & Sorenson, *Introduction to Data- Structure with applications*, 8th Ed., Tata McGrawHill,2011.

REFERENCE:

1. Rajesh K. Shukla, *Data Structures Using C & C++*, Wiley-India 2016.
2. ISRD Group, *Data Structures Using C*, Tata McGraw-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. GavPai, *Data Structures*, Tata McGraw-Hill, 2015.

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LIST OF PRACTICALS

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, in order 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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BTCS307M	DCC	**Principles of Operating Systems**	60	20	20	30	20	3	0	2	**4**

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COURSE OBJECTIVES:

The student will have ability to:

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

COURSE OUTCOMES:

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

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

SYLLABUS

UNIT I — 10 HOURS

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 — 9 HOURS

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.

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UNIT III **8 HOURS**

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.

UNIT IV **7 HOURS**

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 **8 HOURS**

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.

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TEXTBOOKS:

1. Abraham Silberschatz, *Operating system concepts*, 10th Ed., John Willey & Sons. INC, 2018.
2. Andrew S. Tannanbaum, *Modern operating system*, 4th Ed., Pearson Education, 2014.

REFERENCE:

1. Achyut S Godbole, *Operating System*, 3rd Ed. TMH, 2017.
2. William Stalling, *Operating system*, 8th Ed., Pearson Education, 2014.
3. Vijay Shukla, *Operating System*, 3rd. Ed., Kataria & Sons, 2013.
4. Singhal & Shivratri, *Advanced Concept in Operating Systems*, 1st Ed., Tata Mc-Graw Hill, Education Ed., 2017.

LIST OF PRACTICALS

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 are 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?
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 will happen if all picked the pen for writing simultaneously?

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10. Find the solution for dentist checkup clinic where only one chair and one dentist is 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 has to 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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COURSE OBJECTIVES:

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:

Upon completion of the subject, 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.

SYLLABUS

UNIT I — 10 HOURS

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 — 9 HOURS

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.

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UNIT III **8 HOURS**

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.

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 **7 HOURS**

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 **8 HOURS**

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.

TEXTBOOKS:

1. Roger S. Pressman, *Software Engineering - A practitioner's Approach*, 6th Ed., McGraw Hill International Edition.
2. James F. Peters, Witold Pedrycz, *Software Engineering - an Engineering approach*, John Wiley.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment	END SEM University Exam	Teachers Assessment				
BTCS402N	**DCC**	**Software Engineering and Project Management**	**60**	**20**	**20**	**30**	**20**	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

REFERENCE:

1. Waman S Jawadekar, *Software Engineering principles and practice*, The McGraw-Hill Companies.
2. Meiler page-Jones, *Fundamentals of object-oriented design using UML*, Pearson Education.
3. Rajib Mall, *Fundamentals of Software Engineering*, Second Ed., PHI Learning.
4. Sommerville, *Software Engineering*, 7th Ed., Pearson Education.
5. Grady Booch, James Rambaugh, Ivar Jacobson, *The unified modeling language user guide*, Pearson Education.
6. Pankaj Jalote, *An Integrated Approach to Software Engineering*, Narosa Pub, 2005.
7. Richard H. Thayer, *Software Enginerring & Project Managements*, Willey India.

LIST OF PRACTICALS

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 argouml.
13. Use testing tool such as junit.
14. Using configuration management tool-libra.

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B.Tech CSE(Machine Learning & Cloud Computing in association with Google Cloud)

SEMESTER-III(2024-2028)

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BTMLCC311M	**DCC**	**Fundamentals of Cloud Computing Using Google Cloud**	**60**	**20**	**20**	**30**	**20**	**2**	**0**	**2**	**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 exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. To understand Core Cloud Concepts
2. To Navigate and Utilize the Google Cloud Platform (GCP) Console.
3. To Deploy and Manage Basic Compute Resources
4. To Implement Fundamental Storage and Database Solutions.
5. To Identify and Apply Core Networking and Security Principles on GCP.

COURSE OUTCOMES:

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

1. Articulate the advantages and disadvantages of cloud computing and differentiate between various cloud service and deployment models.
2. Navigate the Google Cloud Console to provision and manage a variety of GCP resources, including virtual machines, storage buckets, and databases.
3. Deploy and Manage basic web applications or services using appropriate Google Cloud compute options, such as Compute Engine, App Engine, or Cloud Run.
4. Select and Implement suitable Google Cloud storage and database solutions for different data types and application requirements.
5. Configure basic network connectivity and Apply fundamental security practices using Google Cloud's networking and Identity and Access Management (IAM) services.

SYLLABUS

UNIT I — 10 HOURS

Course Introduction

Cloud Basics: Introduction, Cloud computing, Cloud vs. traditional architecture, IaaS, PaaS, and SaaS, Google Cloud architecture, User interface: Introduction, The Cloud Console, Google Cloud billing, Cloud Shell, Google Cloud APIs.

UNIT II — 9 HOURS

Google Cloud Computing Foundations: Infrastructure in Google Cloud

Introduction, Storage options in the cloud, Structured and unstructured data storage, Unstructured storage using Cloud Storage,CLI/SDK, Cloud Storage: SQL managed services, Exploring Cloud SQL, Cloud SQL for My SQL: Cloud Spanner as a managed service, NoSQL managed services options, Firestore,

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BTMLCC3 11M	**DCC**	**Fundamentals of Cloud Computing Using Google Cloud**	**60**	**20**	**20**	**30**	**20**	**2**	**0**	**2**	**3**

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A NoSQL document store, Bigtable as a NoSQL option, Managed Services: The purpose of APIs, Cloud Endpoints

UNIT III **8 HOURS**

Google Cloud Computing Foundations: Networking & Security in Google Cloud

Networking in the cloud, Virtual Private Clouds (VPCs), The basics of public and internal IP addresses, The Google Cloud network, Routes and firewall rules in the cloud, Multiple VPC networks, Multiple VPC Networks, VPC Networks - Controlling Access, Building hybrid clouds, Load balancing options, HTTP Load Balancer with Cloud Armor , Automation: Introduction, Introduction to Infrastructure as Code (Ia C), Terraform,Monitoring and managing services, applications, and infrastructure, Google Cloud's operations suite.

UNIT IV **7 HOURS**

Google Cloud Computing Foundations: Data, ML, and AI in Google Cloud

Big data: Introduction, big data managed services in the cloud, Leverage big data operations with Dataproc: Console Command Line, Dataproc Big Query, and Google’s Enterprise Data Warehouse.

UNIT V **8 HOURS**

Google Cloud Computing Foundations: Machine learning

Introduction, Machine learning in the cloud, Building ML models with Vertex AI, Lab Intro: Vertex AI Vertex AI Auto ML, Custom training, Pre-built APIs, Lab Intro: Cloud Natural Language API: Google Cloud Speech API: Speech-to-Text API: Video Intelligence

TEXTBOOKS AND REFERENCE:

https://www.cloudskillsboost.google/course_templates/153
https://www.cloudskillsboost.google/course_templates/154
https://www.cloudskillsboost.google/course_templates/155
https://www.cloudskillsboost.google/course_templates/156

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BTMLCC311M	**DCC**	**Fundamentals of Cloud Computing Using Google Cloud**	**60**	**20**	**20**	**30**	**20**	**2**	**0**	**2**	**3**

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LIST OF PRACTICALS

1) A Tour of Google Cloud Hands-on Labs, Lab Intro: Getting Started with Cloud Shell and gcloud.
2) Cloud Storage: Qwik Start - CLI/SDK
3) Cloud SQL for MySQL: Qwik Start
4) Lab Intro: Multiple VPC Networks
5) Lab Intro: VPC Networks - Controlling Access
6) Lab Intro: Dataproc: Qwik Start – Console
7) Lab Intro: Dataproc: Qwik Start - Command Line
8) Lab Intro: Dataflow: Qwik Start – Templates
9) Lab Intro: Dataflow: Qwik Start – Python
10) Lab Intro: Dataprep: Qwik Start
11) Lab Intro: Vertex AI: Qwik Start
12) Lab Intro: Cloud Natural Language API: Qwik Start
13) Lab Intro: Google Cloud Speech API: Qwik Start
14) Speech-to-Text API: Qwik Start
15) Lab Intro: Video Intelligence: Qwik Start

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BTIT301N	DCC	Computer Networks	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. Understand the general overview of the concepts and fundamentals of computer networks.
2. Understand the various components required to build different networks.
3. Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

COURSE OUTCOMES:

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

1. Understanding basic computer network technology.
2. Understand the functions of each layer in the OSI and TCP/IP reference model.
3. Obtain the skills of subnetting and routing mechanisms.
4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.

SYLLABUS

UNIT I — 9 HOURS

Introduction: Importance of Computer Networks, Classifications & Types. Layered Architecture: Protocol hierarchy, Interfaces and Services, Connection Oriented & Connection less Services, ISO- OSI Reference Model, TCP/IP model overview, comparison of TCP/IP and ISO-OSI reference model.

UNIT II — 9 HOURS

Data Link Layer & MAC Sublayer: Need, Services Provided, Design issues, Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel. Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), CSMA, CSMA/CA, CSMA/CD.

UNIT III — 9 HOURS

Network Layer: Need, Services Provided, Design Issues, Routing Algorithms and types of Routing Algorithm, IPv4, IPv6, Classful and classless Addressing, Subnetting, Supernetting.

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BTIT301N	DCC	Computer Networks	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV **10 HOURS**

Transport Layer: Need, Design Issues, Multiplexing and Demultiplexing, transport layer services, UDP,UDP Header Format, Principles of reliable data transfer, TCP, Connection Management, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management, SCTP.

UNIT V **8 HOURS**

Session layer: Overview, Authentication, Session layer protocols.

Presentation layer: Overview, Data conversion, Encryption and Decryption, Presentation layer protocols (LPP, Telnet, X.25 packet Assembler/Disassembler).

Application Layer: Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, FTP.

TEXTBOOKS:

1. Andrew S Tanenbaum, *Computer Networks*, 6th Ed., Pearson Education, 2016.
2. Behrouz A. Forouzan, *TCP/IP-Protocol suite*, 4th Ed., McGraw-Hill, 2010.

REFERENCE:

1. William Stallings, *Data and Computer Communication*, 10th Ed., Pearson, 2014.
2. Comer, *Internet working with TCP/IP Volume one*, Addison-Wesley, 2015.
3. W. Richard Stevens, *TCP/IP Illustrated, Volume 1*, 2nd Ed., Addison-Wesley Professional Computing Series.

LIST OF PRACTICALS

1. Demonstrate Different Types of Network Equipment's.
2. Color coding standard of CAT 5, 6, 7 and crimping of cable in RJ-45.
3. LAN installations and Configurations.
4. Experiment with basic Network configuration commands.
5. Write a program for error detection and correction technique.
6. Write a program for framing.
7. Write a program for routing algorithm.
8. Socket Programming.
9. Study about different network simulators.
10. Establish and simulate peer to peer network using packet tracer.
11. Simulate LAN using hub and switch and discuss pros and cons of hub.
12. Router configuration using packet tracer.

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

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COURSE OBJECTIVES:

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:

Upon completion of the subject, 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.

SYLLABUS

UNIT I **12 HOURS**

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 HOURS**

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

UNIT III **7 HOURS**

Exceptions handling and Multithreading: 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.

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT307N	SEC	Introduction to core JAVA	0	0	0	30	20	0	0	2	**1**

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT IV **8 HOURS**

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

UNIT V **8 HOURS**

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

TEXTBOOKS:

1. E. Balagurusamy, *Programming with java A Primer*, 4th Ed., Tata McGraw Hill, 2009.
2. H.M. Dietel and P.J. Dietel, *Java How to Program*, 6th Ed., Pearson Education/PHI.

REFERENCE:

1. Y. Daniel Liang, *Introduction to Java programming*, By Pearson Publication.
2. Sourav Sahay, *Object Oriented Programming with C++*, Oxford University Press, 2006.
3. Herbert Schildt, *The Complete Reference Java*, 9th Ed., McGraw Hill, 2014.
4. Bert Bates, Kathy Sierra, *Head First Java*, 2nd Ed., O' Reilly, 2005.

LIST OF PRACTICALS

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.