



Shri Vaishnav Vidyapeeth Vishwavidyalaya

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

Choice Based Credit System (CBCS) 2017-18

SEMESTER IV

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTML301	UG	Environment and Energy Studies	4	0	0	4	60	20	20	0	0

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

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

Course Objectives:

The students will be able to:

1. To understand sources of information required for addressing environmental challenges.
2. To identify a suite of contemporary tools and techniques in environmental informatics.
3. To apply literacy, numeracy and critical thinking skills to environmental problem-solving.

Course Outcomes:

The students should be able to:

1. Apply the principles of ecology and environmental issues that apply to air, land and water issues on a global scale.
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
3. Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community.

SYLLABUS

UNIT-I Environmental Pollution and Control Technologies: Environmental Pollution & Control: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and industrial pollution, Ambient air quality standards. Water pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid Waste management composition and characteristics of e - Waste and its management. Pollution control technologies: Wastewater Treatment methods: Primary, Secondary and Tertiary.

UNIT-II Natural Resources: Classification of Resources: Living and Non - Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problem, Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable energy source, case studies.

UNIT-III Ecosystems: Definition, Scope and Importance ecosystem. Classification, Structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Energy flow in the ecosystem, Biogeochemical cycles, Bioaccumulation, ecosystem value, devices and carrying capacity, Field visits.

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UNIT-IV Biodiversity and its Conservation: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man/wildlife conflicts; Conservation of biodiversity: In-situ and Ex-situ conservation. National biodiversity act.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio- economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan(EMP).

Text Books:

1. Agarwal, K.C.,(latest edition).**Environmental Biology**, Bikaner :Nidi Pub. Ltd.,
2. Brunner R.C.(latest edition) **Hazardous Waste Incineration**, McGraw Hill Inc.
3. Clank R.S. ,(latest edition. **Marine Pollution**, Clanderson Press Oxford (TB).
4. **Environmental Encyclopedia**, Jaico Pub. Mumbai,
5. De A.K.(latest edition) **Environmental Chemistry**, Wiley Western Ltd.

Reference Books:

1. ErachBharucha(2005).Environmental Studies for Undergraduate Courses by for University Grants Commission.
2. R. Rajagopalan(2006).Environmental Studies. Oxford University Press.
3. M. AnjiReddy(2006).Textbook of Environmental Sciences and Technology. BS Publication.
4. Richard T. Wright(2008).Environmental Science: towards a sustainable future PHL Learning Private Ltd. New Delhi.
5. Gilbert M. Masters and Wendell P. Ela.(2008).Environmental Engineering and science. PHI Learning Pvt Ltd.
6. Daniel B. Botkin& Edwards A. Keller(2008).Environmental Science Wiley INDIA edition.
7. AnubhaKaushik(2009).EnvironmentalStudies. New age international publishers.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS403	UG	Data Structure and Algorithms	3	1	2	5	60	20	20	30	20

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

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

Course Objectives:

1. To teach 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 teach 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

Introduction, Overview of Data structures, Types of data structures, Primitive and Non Primitive data structures and Operations, Algorithms. Characteristic of Array, One Dimensional Array, Operation with Array, Two Dimensional Arrays, Three or Multi-Dimensional Arrays. Strings, Array of Structures, Drawbacks of linear arrays, Pointer and Arrays, Pointers and Two Dimensional Arrays, Array of Pointers, Pointers and Strings.

UNIT-II

The Stack as an ADT, Stack operation, Array Representation of Stack, Link Representation of Stack, Application of stack – Recursion, Polish Notation .

The Queue as an ADT, Queue operation, Array Representation of Queue, Linked Representation of Queue, Circular Queue, Priority Queue, & Dequeue, Application of Queues.

UNIT-III

Linked List as an ADT, Linked List Vs. Arrays, Memory Allocation & De-allocation for a Linked List, Linked List operations, Types of Linked List, Implementation of Linked List, Application of Linked List polynomial.

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UNIT-IV

Definitions and Concepts, Binary trees, operations on binary trees, Binary tree and tree traversal algorithms, operations on binary trees, List, representation of Tree. Graph Representation, Graph traversal (DFS & BFS).

UNIT-V

Sort Concept, Shell Sort, Radix sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort, List Search, Linear Index Search, Index Sequential Search Hashed List Search, Hashing Methods, Collision Resolution.

Text Books:

1. Ashok N. Kamthane, "Introduction to Data structures", Pearson Education India.
2. Tremblay & Sorenson, "Introduction to Data- Structure with applications", Tata Mc-Graw Hill.
3. Bhagat Singh & Thomas Naps, "Introduction to Data structure", Tata Mc- Graw Hill.
4. Robert Kruse, "Data Structures and Program Design", PHI.
5. Aaron M. Tenenbaum & Moshe J. Augenstein, "Data Structure using PASCAL", PHI.

Reference Books:

1. Data Structures Using C & C++, Rajesh K. Shukla, Wiley- India.
2. Data Structures Using C, ISRD Group, Second Edition, Tata McGraw-Hill.
3. Data Structure Using C, Balagurusamy.
4. C & Data Structures, Prof. P.S. Deshpande, Prof. O.G. Kakde, Dreamtech press.
5. Data Structures, Adapted by: GAV PAI, Schaum's Outlines.

List of Practical:

1. To develop a program to find an average of an array using AVG function.
2. To implement a program that can insert, delete and edit an element in array.
3. To develop an algorithm that implements push and pop stack operations and implement the same using array.
4. To perform an algorithm that can insert and delete elements in queue and implement the same using array.
5. To implement an algorithm for insert and delete operations of circular queue and implement the same using array.
6. To develop an algorithm for binary tree operations and implement the same.
7. To design an algorithm for sequential search, implement and test it.
8. To develop an algorithm for binary search and perform the same.
9. To implement an algorithm for Insertion sort method.
10. To develop an algorithm that sorts number of elements using bubble sort method.
11. To design an algorithm for Merge sort method and implement the same.

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BTCS404	UG	Computer System Organization	3	1	0	4	60	20	20	0	0

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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.

Course Objectives:

1. Understand the architecture of a modern computer with its various processing units.
2. To impart knowledge on processor speed and processing of programs.
3. The performance measurement of the computer system.
4. To introduce hardware utilization methodology.
5. To impart knowledge in inter process communication.

Course Outcomes:

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

1. Students can understand the architecture of modern computer.
2. They can analyze the Performance of a computer using performance equation.
3. Understanding of different instruction types.
4. They can understand how computer stores positive and negative numbers.

Syllabus:

UNIT-I

Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization

UNIT-II

Control Unit Organization: Hardwired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

UNIT-III

Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, 8085 I/O structure, 8085 instruction set and basic programming. Data transfer – Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex.

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UNIT-IV

Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

UNIT-V

Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

Text Books:

1. Carter; Computer Architecture (Schaum); TMH
2. Carl Hamacher: Computer Organization, TMH

Reference Books:

1. Morris Mano: Computer System Architecture, PHI.
2. Tanenbaum: Structured Computer Organization, Pearson Education
3. J P Hayes, Computer Architecture and Organisations, Mc- Graw Hills, New Delhi
4. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
5. William Stallings: Computer Organization and Architecture, PHI
6. ISRD group; Computer Organization; TMH
7. Carter; Computer Architecture (Schaum); TMH
8. Carl Hamacher: Computer Organization, TMH

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS405	UG	Data Base Management System	3	1	2	5	60	20	20	30	20

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

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Course Objectives:

The student will have ability to:

1. To understand the dissimilar issues concerned in the intend and implementation of a database system.
2. To learn the physical and logical database design, database modeling, relational, hierarchical, and network models
3. To understand and develop data manipulation language to query, modernize, and manage a database
4. To expand an understanding of necessary DBMS concepts such as: database security, integrity, concurrency,
5. To intend and build a straightforward database system and show competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Course Outcomes:

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

1. Evaluate business information problem and find the requirements of a problem in terms of data.
2. Understand the uses the database schema and need for normalization.
3. Design the database schema with the use of appropriate data types for storage of data in database.
4. Use different types of physical implementation of database
5. Use database for concurrent use.
6. Backup data from database.

Syllabus:

UNIT-I

INTRODUCTION TO DATABASE CORE CONCEPTS AND APPLICATIONS: What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management, Introduction to File and Database systems- Database system structure , Data Models , Introduction to Network and Hierarchical Models , ER model , Relational Model , Relational Algebra and Calculus.

UNIT-II

RELATIONAL DATA STRUCTURE: SQL Relations, Domains, Attributes, Keys, Extensions and Intentions, Base Table, Indexes, System R, Data Manipulation, Retrieval, Operations, Built-

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in-Functions, Update Operations, Introduction of SQL, Multi table Queries, Nested Queries or Sub queries, Multiple Row Nested Queries, Data Manipulation Language, The Create Table Statement

UNIT-III

DATA STORAGE AND QUERY PROCESSING: Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques , Index Structure for files ,Different types of Indexes- B-Tree - B+Tree ,Query Processing.

UNIT-IV

RELATIONAL DATABASE DESIGN AND TRANSACTION MANAGEMENT: Relational algebra, Traditional Set operations, Attribute Name for Derived Relations, Special Relational Operations, Relational Calculus, Type Oriented Relational Calculus, Further Normalization, Functional Dependence, First, Second and Third Normal forms, Relations with more than one candidate key, Good and Bad Decompositions, Fourth Normal Form, Fifth Normal Form. Transaction Processing: Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules , Concurrency Control , Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control , Recovery Techniques , Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT-V

THE NETWORK APPROACH AND SECURITY AND INTEGRITY:The architecture of an IMS system, Background, Architecture, IMS Data Structure, Physical Database, The Database Description, Hierarchical Sequence, IMS data manipulation, Defining the Program Communication Block (PCB). The DL/I Examples, Constructing the Segment Search Argument, using more than one PCB. Object Oriented Databases , Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage , XML , Structure of XML- Data-XML Document- Schema- Querying and Transformation. , Data Mining and Data Warehousing.Introduction, Security and Integrity Violations, Authorization, Granting of Privileges, Security Specification in SQL

Text Books:

1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill ,
2. Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.
3. Date C J, "An Introduction To Database System", Pearson Educations
4. Elmasri, Navathe, "Fundamentals Of Database Systems", Pearson Educations

Reference Books:

1. Understanding SQL by Martin Gruber, BPB.
2. SQL- PL/SQL by Ivan bayross.
3. Oracle – The complete reference – TMH /oracle press.
4. AtulKahate , " Introduction to Database Management System", Pearson Educations.
5. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press, TMH.
6. Paneerselvam,"DataBase Management System", PHI Learning.

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7. 7.Sanjeev Sharma, JitendraAgarwal, ShikhaAgarwal, “Advanced DBMS”, Dreamtech Publication

List of Practical:

1. Design a Database and create required tables. For e.g. Bank, College Database
2. Apply the constraints like Primary Key , Foreign key, NOT NULL to the tables.
3. Write a sql statement for implementing ALTER,UPDATE and DELETE
4. Write the queries to implement the joins
5. Write the query for implementing the following functions:
MAX(),MIN(),AVG(),COUNT()
6. Write the query to implement the concept of Integrity constraints
7. Write the query to create the views 8) Perform the queries for triggers
8. Perform the following operation for demonstrating the insertion , updation and deletion using the referential integrity constraints
9. Write the query for creating the users and their role.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIBDA401	UG	Foundation in Business Analytics Using IBM Cognos Insight	3	1	2	5	60	20	20	30	20

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

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

Course Objectives:

After completing this course, you should be able to:

1. The importance of analytics and how its transforming the world today
2. Understand how analytics provided a solution to industries using real case studies
3. Explain what is analytics, the various types of analytics, and how to apply it
4. Understand how a business analysis software works, and its architecture
5. Describe a reporting application, its interface, and the different report types
6. Create different types of advanced reports
7. Understand Active Reports and how to create them

Course Outcomes:

1. English proficiency
2. Microsoft Windows operating system basic experience
3. Basic Internet and web browser usage experience
4. Knowledge of an organization's business intelligence and reporting needs
5. Basic database background is preferred
6. Basic knowledge of XML is preferred
7. Exposure to the IBM Skills Academy portal learning environment
8. Exposure to the IBM Skills Academy cloud hands-on labs platform

Syllabus:

UNIT I – ANALYTICS OVERVIEW

Course Introduction

1. Analytics overview

Overview	This unit provides an understanding of the importance of business analytics in our world, society, and life.
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Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> • Understand how analytics is transforming the world • Understand the profound impact of analytics in business decisions • Understand what is analytics and how it works • Understand why business analytics has become important in various industries
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2. Analytics trends: Past, present & future

Overview	This unit explains how analytics has evolved over time.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> • Understand the history of analytics and how it has changed today • Understand how to analyze unstructured data • Understand how analytics is making the world smarter • Understand where the future of analytics lies

3. Towards a predictive enterprise

Overview	This unit explains the effects of business analytics in the corporate world that has led to its global adoption across geographies and industries.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> • Explain why successful enterprises need business analytics • Understand how business analytics can help turn data into insight • Understand how predictive analytics is transforming all types of organizations

4. Analytics: Industry domains

Overview	This unit highlights the application of analytics across major industries.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> • Understand how predictive analytics is transforming all types of organizations • Explain how analytics supports retail companies • Understand how analytics can reduce crime rates and accidents • Explain the use of analytics in law enforcement and insurance companies • Understand how analytics can affect the future of education

5. Business Intelligence and Analytics

Overview	This course provides a collection of resources designed for participants to become familiar with business intelligence (BI) and analytics concepts. Participants will review materials to introduce themselves to terminology and practical business use cases for a high level understanding of BI and analytics. The course includes a pre-assessment for participants to measure their understanding of the content before taking the course, and a post-assessment for participants to gauge their learning after reviewing the materials.
Learning objectives	After completing this course, you should be able to: <ul style="list-style-type: none"> • Explain what is analytics • Define various types of analytics • Demonstrate how to apply analytics • Describe business intelligence • Demonstrate how to apply business intelligence

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UNIT – II BUSINESS ANALYTICS FOUNDATIONS

1. Business analysis solution for consumers

Overview	IBM Cognos Analytics for Consumers (v11.0) will teach IBM Cognos Analytics consumers how to access content, use reports, create dashboards, and personalize the appearance of IBM Cognos Analytics portal.
Learning objectives	After completing this course, you should be able to: <ul style="list-style-type: none">• Learn how to access content, use reports, and create dashboards• Learn how to personalize the IBM Cognos Analytics portal

UNIT – III BUSINESS INTELLIGENCE ANALYST

1. Introduction to IBM Cognos Analytics

Overview	In this unit, you will learn about IBM Cognos Analytics, different report types, how to create reports and examine personal data sources and modules.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Examine IBM Cognos Analytics• Explore different report types• Create reports in preview or design mode• Create a simple, sorted, formatted report• Examine dimensionally modelled and dimensional data sources• Examine personal data sources and data modules

2. Create list reports

Overview	In this unit you will learn about how to create list reports.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Group, format, and sort list reports• Describe the various options for aggregating data• Create a multi-fact query• Create a report with repeated data

3. Focus reports using filters

Overview	In this unit you will learn about how to focus reports using filters.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create filters to narrow the focus of reports• Examine detail filters and summary filters• Determine when to apply filters on aggregate data

4. Create crosstab reports

Overview	In this unit you will learn about how to create crosstab reports
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Format and sort crosstab reports• Create complex crosstab reports using drag and drop functionality• Create crosstab reports using unrelated data items

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5. Present data graphically

Overview	In this unit you will learn about how present data graphically.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create charts containing peer and nested columns• Present data using different chart type options• Add context to charts• Create and reuse custom chart palettes• Introduction to visualization• Present key data in a single dashboard report

6. Focus reports using prompts

Overview	In this unit you will learn how to focus reports using prompts.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Identify various prompt types• Use parameters and prompts to focus data• Search for prompt types• Navigate between pages

7. Extend reports using calculations

Overview	In this unit you will learn how to extend reports using calculations.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create calculations based on the data in the data source• Add run-time information to the reports• Create expressions using functions

8. Customize reports with conditional formatting

Overview	In this unit you will learn how to customize reports using conditional formatting.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create multi-lingual reports• Highlight exceptional data• Show and hide data• Conditionally render objects in reports• Conditionally format one crosstab measure based on another

9. Drill-through definitions

Overview	In this unit you will learn how to drill-through from one report to another.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Know how to let users navigate from a specific report to a target report• Pass parameter values to filter the data in drill-through targets• Navigate through multiple reports

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1. Create query models

Overview	In this unit you will learn about creating query models and how to filter query data.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Build query models and connect them to the report layout• Edit an SQL statement to author custom queries• Add filters and prompts to a report using the query model

2. Create reports based on query relationships

Overview	In this unit, you will learn about query relationships and how to combine different queries to generate reports.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create reports by merging query results• Create reports by joining queries• Combine data containers based on relationships from different queries

3. Create advanced dynamic reports

Overview	In this unit, you will learn how to create advanced dynamic reports.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Filter reports on session parameter values• Navigate a briefing book using a table of contents• Create dynamic headers and titles that reflect report data• Let users navigate to specific locations in reports• Create a customer invoice report

4. Design effective prompts

Overview	In this unit, you will learn how to design effective prompts to create more efficient reports.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Control report displays using prompts• Specify conditional formatting values using prompts• Specify conditional rendering of objects based on prompt selection• Create sorted and filtered reports based on prompt selection

UNIT V– BUSINESS INTELLIGENCE ANALYST

1. Introduction to IBM Cognos Active Reports

Overview	In this unit, you will learn about creating query models and how to filter query data.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Describe Active Reports, and their value• Save Active Reports• Create Active Reports as prompt pages• Convert existing reports to Active Reports• Explain security considerations in Active Reports• Debug Active Report behavior

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2. Use Active Report connections

Overview	In this unit, you will use active report connections
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Describe active report connections• Filter and select active report controls• Modify the interactive behavior of report controls• Identify active report controls and variables• Use variables to control multiple controls independently• Control multiple controls from a single variable• Author and optimize active reports for mobile consumption

3. Active Report charts, visualizations, and decks

Overview	In this unit, you will learn about active report charts, visualizations, and decks.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Describe characteristics of traditional charts in Active Reports• Control data display using decks and data decks• Use decks and data decks to display traditional charts• Optimize decks for performance• Describe characteristics of RAVE visualizations

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTICMC401	UG	Industry Session on Emerging Technologies Cloud Computing	0	0	2	1	0	0	0	0	50

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

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

Course Objectives:

1. Define cloud computing
2. Describe the choices that are available to developers when creating cloud applications
3. Describe infrastructure as a service, platform as a service, and software as a service
4. Describe IBM Cloud
5. Describe the architecture of IBM Cloud
6. Identify the runtimes and services that IBM Cloud offers
7. Describe how Cloud Foundry works with IBM Cloud
8. Describe what you can build in IBM Cloud
9. Describe how to create an application in IBM Cloud
10. Describe how to create services in IBM Cloud
11. Describe how to manage your IBM Cloud users and resources
12. Describe the role of Node.js for server-side scripting
13. Describe the features in IBM Cloud that help you to set up a cooperative workstation environment
14. Explain how to manage your IBM Cloud account with IBM Cloud CLI and Cloud Foundry CLI
15. Describe how to setup and use the IBM Cloud plug-in for Eclipse
16. Deploy an application from local workstation using the IBM Cloud CLI
17. Deploy an application from Eclipse to IBM Cloud
18. Describe DevOps
19. Describe the capabilities of IBM Cloud Continuous Delivery
20. Identify the Web IDE features in IBM Cloud Continuous Delivery
21. Describe how to use Git Repos and Issue Tracking
22. Explain the pipeline build and deploy processes
23. Create a Git repository to manage your source code
24. View and edit code in the Eclipse Orion Web Integrated Development Environment (IDE)
25. Build and Deploy code to IBM Cloud using DevOps
26. Describe the characteristics of REST APIs
27. Explain the advantages of the JSON data format
28. Describe IBM Watson
29. Provide examples of REST APIs using IBM Watson
30. Describe the benefits of IBM Cloudant

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31. Explain how Cloudant databases and documents are accessed from IBM Cloud
32. Explore the features of the Cloudant dashboard
33. Create, update, and retrieve Cloudant documents by using REST APIs • Describe Mobile Backend
34. as a Service (MBaaS), and MBaaS architecture.
35. Describe Push Notifications, App ID, and Kinetise services
36. Create a mobile application by using Kinetise
37. Integrate your mobile application with Cloudant NoSQL DB
38. Explain the origin and purpose of the Node.js JavaScript framework
39. Write a simple web server with Node.js

Course Outcomes:

At the end of the course, the student can:

1. Earn basic knowledge of Cloud Technologies in use today
2. Strategic plan to move applications and services to the Cloud
3. Understand Cloud Segments and Cloud Deployment Models
4. Importance of security in cloud computing
5. Static Application Development using Service models

Syllabus:

Unit 1 HTML 5 and Javascript

- Describe what HTML does
- List the objectives of HTML5
- The document types that are supported in HTML5
- The document object model (DOM) tree
- Some of the differences between HTML4 and HTML5
- List some HTML document API properties and methods
- How scripting is enabled in browsers
- Browser support for HTML5 features
- JavaScript primitives and objects
- How variables are declared and used in JavaScript
- JavaScript control structures
- Functions in JavaScript
- The document object model (DOM) hierarchy
- The window and document objects
- Identify the DOM objects that are commonly used in JavaScript applications for working with HTML documents
- Creating HTML web pages
- Use style statements in HTML documents
- Connect scripts to documents
- Writing JavaScript functions
- Creating interactive alert and confirm window objects
- Using JavaScript to modify the document object model (DOM)
- Listing new elements in HTML5
- HTML5 structural elements: section, article, header, footer, figure, figcaption
- The attributes of the HTML5 input element: tel, email, datetime, number, range, color
- Creating a web page and insert a simple HTML5 form layout
- Adding new markup elements
- Using input types that include attributes such as email to perform client-side validation

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- Test the application

Unit 2: Essentials of Cloud Application Development

- Defining cloud computing
- Describing the factors that lead to the adoption of cloud computing
- Describing the choices that developers have when creating cloud applications
- Describing infrastructure as a service, platform as a service, and software as a service •
- Describe IBM Cloud
- Describing how Cloud Foundry works with IBM Cloud
- Identify the runtimes and services that IBM Cloud offers

Unit 3: Cloud Application development process

- Describing IBM Cloud
- Describing what you can build in IBM Cloud
- Describing how to create an application in IBM Cloud
- Describing the IBM Cloud dashboard, catalog, and documentation features
- Describing how the application route is used to test an application in the browser
- Describing how to create services in IBM Cloud
- Describing how to bind services to an application in IBM Cloud
- Describing the environmental variables that are used with IBM Cloud services
- Describing how to manage your IBM Cloud users and resources
- Explaining how to manage your IBM Cloud account with the Cloud Foundry CLI and IBM Cloud CLI
- Describing how to create a Node.js application that runs on IBM Cloud
- Describing the features in IBM Cloud that help you set up a cooperative workstation environment
- Describing the role of Node.js for server-side scripting
- Describing how to setup and use the IBM Cloud plug-in for Eclipse
- Downloading the Eclipse and required plugins for developing cloud applications on Eclipse
- Configuring Eclipse to work with the cloud development platform
- Push applications from Eclipse to the cloud development platform
- Describing DevOps
- Describing the capabilities of IBM Cloud Continuous Delivery
- Identifying the Web IDE features in IBM Cloud Continuous Delivery
- Describing how to use Git Repos and Issue tracking
- Explaining the pipeline build and deploy process
- Describing the characteristics of REST APIs.
- Explaining the advantages of the JSON data format.
- Providing examples of REST APIs using IBM Watson.
- Creating a mobile application by using Kinetise.
- Developing a mobile application UI by using Kinetise drag controllers.
- Building a mobile application to test on a real device.
- Integrating your mobile application with Cloudant NoSQL DB.

Unit 4: Developing Cloud Application with SDK for Node.J

- Explaining the origin and purpose of the Node.js JavaScript framework
- Writing a simple web server with Node.js
- Import Node.js modules into your script
- Creating an IBM SDK for Node.js application.
- Writing your first Node.js application.
- Deploying an IBM SDK for Node.js application on an IBM Cloud account.

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- Creating a Node.js module and use it in your code.
- Explaining the concept of anonymous callback functions
- Explaining the concept of asynchronous callback functions
- Create a callback function
- Defining a package dependency
- Creating an Express server object
- Handling inbound HTTP method calls for a server resource
- Creating a callback function to intercept HTTP method calls
- Parse JSON data from an HTTP message
- Creating a Hello World Express application
- Creating Simple HTML view for your application
- Understanding Express routing

Unit 5: Web Services and Application Deployment

- Using third-party modules in Node.js
- Understanding the Watson Natural Language Understanding service
- Clone an IBM Cloud application.
- Using React to create interactive web pages.
- Using the Fetch API to interact with back-end web services.
- Understanding the following concepts of ES6:
 - Classes
 - Arrow functions
 - Promises
- Cloud Computing real time application and Case Study
- Application Development using real time platform
- Launching an application and deployment on cloud

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS406	UG	Mobile Application lab	0	0	2	1	0	0	0	0	50

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

***Teacher Assessment** shall be based 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. Describe those aspects of mobile programming that make it unique from programming for other platforms,
2. Critique mobile applications on their design pros and cons,
3. Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
4. Program mobile applications for the Android operating system that use basic and advanced phone features, and
5. Deploy applications to the Android marketplace for distribution.

Course Outcomes:

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

1. Students will understand aspects of mobile.
2. Students will be able to develop rapid prototyping techniques to design and develop sophisticated mobile interfaces.
3. Students will be able to create Program mobile applications for the Android operating system that use basic and advanced phone features, and
4. Students will be able to build applications to the Android marketplace for distribution.

Syllabus:

UNIT-I

Introduction to mobile devices and Administrative, Mobile devices vs. desktop devices - ARM and intel architectures - Power Management - Screen resolution - Touch interfaces - Application development - App Store, Google Play, Windows Store - Development environments introduction: XCode , Eclipse , PhoneGAP, etc - Native vs. web applications.

UNIT-II

Mobile OS Architectures: Comparing and Contrasting architectures of all three – Android, iOS and Windows - Underlying OS (Darwin vs. Linux vs. Win 8) - Kernel structure and native level programming - Runtime (Objective-C vs. Dalvik vs. WinRT) - Approaches to power management – Security.

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UNIT-III

Introduction to Android Development Environment, Android/iOS/Win 8 Survival and basic apps, Mobile frameworks, Tools, Native level programming on Android o Low-level programming on (jailbroken) iOS o Windows low level APIs.

UNIT-IV

Study different open source frameworks, tools and basic languages used for mobile development. Basic working knowledge on various editors, tools used in mobile development like android development environment. Mobile Software Engineering, Frameworks and Tools ,Generic UI Development.

UNIT-V

Intents and Service: Android ,Intents and Services , Characteristics of Mobile Applications, Successful Mobile Development, Storing and Retrieving Data, Synchronization and Replication of Mobile Dat, Android Storing and Retrieving Data ,Working with a Content Provider, Communications Via Network and the Web, State Machine, Correct Communications Model, Android Networking and Web , Telephony, Wireless Connectivity and Mobile Apps, Notifications and Alarms, Memory Management, Graphics Performance and Multithreading, Graphics and UI Performance Android Graphics and Multimedia Mobile Agents , Location Mobility and Location Based Packaging and Deploying Performance Best Practices.

Text Books:

1. Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides)
2. Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps

Reference Books:

1. <http://www.tutorialspoint.com/android/>
2. <http://rypress.com/tutorials/objective-c/index>
3. <http://www.programiz.com/python-programming>

List of Practical:

1. Write a html program for Creation of web site with forms, frames, links, tables etc
2. Design a web site using HTML and DHTML. Use Basic text Formatting, Images,
3. Create a script that asks the user for a name, then greets the user with “Hello” and the user name on the page
4. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
5. Using CSS for creating web sites
6. Creating simple application to access data base using JDBC Formatting HTML with CSS.
7. Program for manipulating Databases and SQL.
8. Basic android programs.
9. Basic programs in objective c.
10. Programs in eclipse tools.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTCS407	UG	Programming with Python	0	0	4	2	0	0	0	60	40

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

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

Course Objectives:

1. To develop proficiency in creating based applications using the Python Programming Language.
2. To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To be able to do testing and debugging of code written in Python.
4. To be able to draw various kinds of plots using PyLab.
5. To be able to use generators for generating series like fibonacci.

Course Outcomes:

Upon completion of this course, the student will be able apply technical knowledge and perform specific technical skills, including:

1. Ability to create robust applications using the Python programming language.
2. Ability to test and debug applications written using the Python programming language.
3. Ability to create applications for solving computational problems using the Python Programming Language.

Syllabus:

UNIT-I Introduction to Python: The basic elements of Python, Branching programs, Strings and Input, Iteration. Functions, Scoping and Abstraction: Functions and Scoping, Specifications, Recursion, Global variables, Modules, Files.

UNIT-II Testing and Debugging: Testing, Debugging. Structured Types, Mutability and Higher order Functions: Tuples, Lists and Mutability, Functions as Objects, Strings, Tuples and Lists, Dictionaries.

UNIT-III Exceptions and assertions: Handling exceptions, Exceptions as a control flow mechanism, Assertions. Classes and Object oriented Programming: Abstract Data Types and Classes, Inheritance, Encapsulation and information hiding.

UNIT-IV Some simple Algorithms and Data Structures: Search Algorithms, Sorting Algorithms, Hash tables. Plotting and more about Classes: Plotting using PyLab, Plotting mortgages and extended examples.

UNIT-V Dynamic Programming: Fibonacci sequence revisited, Dynamic programming and the 0/1 Knapsack algorithm, Dynamic programming and divide and conquer.

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Text Books:

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. Allen Downey, Jeffrey Elkner and Chris Meyers "How to think like a Computer Scientist, Learning with Python", Green Tea Press.
3. Mark Lutz "Learning Python" O'Reilly Media; 5 edition.
4. David Beazley "Python Cookbook, Third edition" O'Reilly Media

Reference Books:

1. Python Essential Reference, 4th Edition Addison-Wesley Professional.
2. Mark Lutz "Programming Python: Powerful Object-Oriented Programming" "David Beazley "Python Cookbook" Third edition, O'Reilly Media

List of Practical:

1. Write a Python Program to Print Hello world!
2. Write a Program to Add Two Numbers.
3. Write a Program to Find the Square Root.
4. Write a Program to Calculate the Area of a Triangle.
5. Write a Program to Solve Quadratic Equation.
6. Write a Program to Swap Two Variables.
7. Write a Program to Generate a Random Number.
8. Write a Program to Convert Kilometers to Miles.
9. Write a Program to Convert Celsius To Fahrenheit.
10. Write a Program to check if a number is positive, negative or zero.
11. Write a Program to Check if a Number is Odd or Even.
12. Write a Program to Check Leap Year.
13. Write a Program to Find the Largest Among Three Numbers.
14. Write a Program to Check Prime Number.
15. Write a Program to Print all Prime Numbers in an Interval.
16. Write a Program to Find the Factorial of a Number.
17. Write a Program to Display the multiplication Table.
18. Write a Program to Print the Fibonacci sequence.
19. Write an English sentence with understandable semantics but incorrect syntax. Write another English sentence which has correct syntax but has semantic errors.
20. Create a program that prompts the user for a number of gallons of gasoline. Reprint that value along with its conversion equivalent number of liters.
21. Write a program that allows a user to enter his or her two favorite foods. The program should then print out the name of a new food by joining the original food names together.
22. Write a Tipper program where the user enters a restaurant bill total. The program should then display two amounts: a 15 percent tip and a 20 percent tip.
23. Write a Car Salesman program where the user enters the base price of a car. The program should add on a bunch of extra fees such as tax, license, dealer prep, and destination charge. Make tax and license a percent of the base price. The other fees should be set values. Display the actual price of the car once all the extras are applied.
24. Create a program with a function that calculates the area of a circle by taking a radius from the user.
25. Write your own sum function called mySum that takes a list as a parameter and returns the accumulated sum.

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