Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of Program: BCA (Big Data Analytics) – IBM

COURSECODE	CATEGORY	COURSENAME	L	T	P	CREDITS	TEACHING & EVALUATIONSCHEME				
							THEORY		PRACTICAL		
							ENDSEM University Exam	TwoTermExam	TeachersAssessment*	ENDSEM University Exam	TeachersAssessment*
BCABDA501	**Major**	**Web Services**	2	0	2	3	60	20	20	30	20

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

***TeacherAssessment**shallbebasedfollowingcomponents:Quiz/Assignment/Project/ParticipationinClass,given that no component shall exceed more than10 marks.

Course Educational Objectives (CEOs):

1. To explain the importance of Web Services and Use of XML JAXB and using SOAP and REST Web Services
2. To learn the importance of Spring Boot and JAVA in Web Services
3. Be able to use POSTMAN accessing dummy URLs as well as self created URLs
4. Able to Secure Web Service using Transport layer and Application Level Security

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 use of SOAP and REST web services in Enterprises from a global context.
2. To understand and Write SOAP web services from industry perspective of Web Services.
3. Applying and analyzing Restful Web Services.
4. To evaluate the application of REST Web Services in university environment by Using JAX-RS and JAX-WS API's in java.
5. Creating and Securing Web Services by Using Transport and Application level Security. Creating projects and research activities based on SOAP & REST API.

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Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

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BCABDA501	**Major**	**Web Services**	2	0	2	3	60	20	20	30	20

Syllabus

Unit-I **10HRS**

WEB SERVICES INTRODUCTION

Introduction to XMl what is Web Services? Why Web Services? Web Services Fundamentals Services Oriented Architecture; HTTP and XML and SOAP WSDL; UDDI; REST; SOAP vs REST JAXB Overview; JAXB Binding Process;

Unit-II **9HRS**

INTRODUCTIONTO SOAP

SOAP Overview; SOAP Message Exchange Model; Data Encoding, Installing and Configuring Apache SOAP; Server and Client Program; Deployment Descriptor, Describing Web Services with Example; Anatomy of a services; Defining Data types and structures with XML Schemas; Describing Web Services Interface and Implementation; Understanding Message patterns.

Unit-III **8HRS**

JAVA API FOR RESTFUL SERVICES

Introduction to JAVA API ;REST and HTTP; Resource URI; Collection URIs; Method Idempotence; What is JAX- RS Introduction to UDDI; UDDI Registry; Technical Architecture; Using UDDI with WSDL. Dispatching Request to Methods Class, Creating a Resource; Returing XML Responses; Installing REST API Client; Building Services Stubs; Accessing Path Params; Returning JSON Response; Implementing POST Update and Delete Methods; Pagination and Filtering

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BCABDA501	**Major**	**Web Services**	2	0	2	3	60	20	20	30	20

Unit-IV **7HRS**

RESTAPIUSINGJAVACLIENTJAX-RS

The Param Annotation; Sending Status codes and location Headers; Handling Exception; Using Web- Application Exception; Content Negotiation and Content Negotiation using HTTP Headers; Content Negotiation using URIs Patterns JAX-RS Client; Creating JAVA Client using JAX-RS; Sending GET/POST Request using JAVA Client.

Unit-V **8HRS**

WRITINGSOAPSERVICES

Initialize a Spring Web Service Application with Spring Boot; Overview of creating SOAP Web Service using Contract First Approach; Define Request and Response XML Structure; Define XSD for Request and Response; Introduction to JAX Band configuration. What are Secure Web Services? Transport Level Security and Application Level Security.

Future of Web Development; Future of SOAP WSDL and UDDI.

PROJECT

Create and execute a SOAP project using WSDL. Following should be done on the project:

I. Creating SOAP project- adding WSDL during creation or after it is created.
II. Request and Response verification

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							THEORY		PRACTICAL		
							ENDSEM University Exam	TwoTermExam	TeachersAssessment*	ENDSEM University Exam	TeachersAssessment*
BCABDA501	**Major**	**Web Services**	2	0	2	3	60	20	20	30	20

Text Books:

1. IBM Course ware
2. IBM Knowledge Center
3. RESTful Web Services by Leonard Richardson O'Reilly Media

References:

1. Core Java, Collection Framework IBM Knowledge Center

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Shri Vaishnav Institute of Computer Applications

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BCABDA502	**Major**	**Microservices Architecture and Implementation**	2	0	2	3	60	20	20	30	20

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

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

Course Objectives:

Students will acquire knowledge on:

1. Understand the importance of Microservices and describe its need as an Architecture Implementation.
2. UnderstandstrengthentheunderstandingofbasicconceptsofDockerandKubernetess.
3. Understand the Html and its Tags
4. Understand CSS and how we implement in html
5. Be able to Deploy application on docker and Access the Kubernetess

Course Outcomes:

At the end of the mobility period, students will be able to:

1. Make an application using node js
2. Run docker commands
3. Deploy container and podson kubernets.

Syllabus:

UNIT–I

CSS and JavaScript: Understand JavaScript and DOM and BOM, Understand Server side Application, Understand No SQL (MongoDb), Deployment of Nodejs application.

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							ENDSEM University Exam	TwoTermExam	TeachersAssessment*	ENDSEM University Exam	TeachersAssessment*
BCABDA502	**Major**	**Microservices Architecture and Implementation**	2	0	2	3	60	20	20	30	20

UNIT–II

Server side nodejs :- Key features of NodeJS, Installation and Configuration, NodeJS Command Line, Sample Project using Node Express command prompt, Node clipse plugin, Sample Project using Node clipse, Performing CRUD Operations, Key features of MongoDB, Connection Pooling using NodeJS Mongo driver, Docker architecture, Virtual machines versus containers, about containers.

UNIT–III

Docker: A shipping container for code, Benefits of using containers, Docker basic concepts, Docker shared and layered file systems technology. Deployment of container, Learn the conceptof kubernetes, Learn how to run Docker command, Understand pods and cluster Container ecosystem,

UNIT–IV

Kubernetess,Container,orchestration,Kubernetessarchitecture,MasterNodeComponents,Worker Node Components, Kubernetess Building Blocks, Images, Immutability, Pod, ConfigMaps & Secrets, Deploying Applications on Kubernetess, PodHealth Checking, Kubectl Commands

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BCABDA502	**Major**	**Microservices Architecture and Implementation**	2	0	2	3	60	20	20	30	20

UNIT–V

Cloud Application Component Architecture, Benefits of using Kubernetess with IBM Containers, About Microservices ,monolithic application, microservice security, api management and gateways, the future of microservices, microservices governance.

TEXTBOOKS:

1. Sam Newman, “Building Microservices”, O’Reilly Media
2. Ajay Sharma, “Microservices Architecture”, Kindle Edition
3. IBM Career education Microservices Architecture and Implementation

REFERENCES:

1. Eberhard Wolff, “Microservices—A Practical Guide”, Korean translation
2. Martin Kleppmann, “Designing Data-Intensive Applications”, O’Reilly Media

Video Lectures

1. https://www.youtube.com/watch?v=dD2EISBDjWM&list=PLr6-GrHUlVf_ZNmuQSXdS197Oyr1L9sPB
2. https://www.youtube.com/watch?v=0afZj1G0BIE&t=38s
3. https://www.youtube.com/watch?v=Ukg_U3CnJWI&t=15s
4. https://www.youtube.com/watch?v=TlB_eWDSMt4
5. https://www.youtube.com/watch?v=voDummz1gO0
6. https://www.youtube.com/watch?v=lktzQrHQcYU
7. https://www.youtube.com/watch?v=I4zWlW93-V4

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BCABDA502	**Major**	**Microservices Architecture andImplementation**	2	0	2	3	60	20	20	30	20

LISTOFEXPERIMENTS:

1. Design a static web application using html and CSS.
2. Write a program to define variable, control structure in JavaScript
3. Define Function in JavaScript and understand message and link.
4. WAP for window in JavaScript and its objects. Create a gaugere port and a pie chart repor
5. Design application using nodejs and configure node-eclipse.
6. Connectivity with mongoDB nodejs app
7. Docker Commands
   - **a.** Listing Running Containers
   - b. Restarting Stopped Containers
   - c. Retrieving Log Outputs
   - d. Container Isolation
   - e. Creating Docker Images
   - f. Building a Docker file
   - g. Copying Build Files
8. Kuber netesss Cluster Demo
9. VM Creation in Google Cloud Platform – Demo
10. Mini kubeon local machine

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA511	DSE	Recent Information Technology Trends	4	0	0	4	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.

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

Course Educational Objectives (CEOs):

Objectiveofthecourseistohelpthestudentstoacquireknowledgeregardingthecurrent trends in Information Technology.

Course Outcomes (Cos): Students will be able to

- Develop knowledge about the recent technologies, their applications and working.
- Enhance the knowledge about various technologies such as, Cloud Computing, Wireless Computing, e-Business, AI, robotic, virtual reality etc.
- Understand importance of green computing.

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA511	DSE	Recent Information Technology Trends	4	0	0	4	60	20	20	0	0

Syllabus:

UNIT -I

Cloud Computing: Introduction, Components, Working of Cloud Computing and various models used in cloud computing.

Wireless Computing: Introduction, Wireless Computing Fundamentals and applications of Wireless Computing.

UNIT –II

E-Commerce: Fundamentals, Architecture and Models (B2B, B2C, C2C, C2B), Electronic Payment System: Types and Process, Introduction and advantage of Internet Advertising

UNIT -III

Artificial Intelligence -Introduction to AI and types of techniques involved into it, Robotics.

Virtual Reality: Introduction and its applications with examples.

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA511	DSE	Recent Information Technology Trends	4	0	0	4	60	20	20	0	0

UNIT- IV

Green Computing: Introduction to Green Computing, Saving Energy on a Machine, Networking Components, Clusters and Data Centers,

UNIT-V

Major Green Initiatives: Sustainable IT, Green Business, Smarter Plant , Computing Technology for Energy Efficiency of other Physical Systems, Open Challenges, Major Players etc.

Text Books

- Denis Rothman, Artificial Intelligence By Example: Develop machine intelligence from scratch using real artificial intelligence use cases, Packt Publishing Limited (31 May 2018)
- Pankaj Arora, Raj Biyani, Salil Dave, To the Cloud: Cloud Powering an Enterprise, McGraw-Hill Education; 1 edition ,January 20, 2012.
- Bud E. Smith, Green Computing: Tools and Techniques for Saving Energy, Money, and Resources, Auerbach Publications1st Edition, September 18, 2018
- Gaurav Gupta, Sarika Gupta, E-Commerce, Khanna Publishing; Second edition (2015)
- JimBlascovichAndJeremyBailenson,InfiniteReality:TheHiddenBlueprintofOurVirtual Lives, Harper Collins Publications, 2011
- HowardRheingold,VirtualReality:TheRevolutionaryTechnologyofComputer-Generated Artificial Worlds- and How It Promises to Transform, Touchstone, 2008

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA521	DSE	Information Systems for Management	4	0	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

Course Educational Objectives (CEOs):

- To develop an understanding among the students about and the role of Information System with its importance and role in society and organizations
- To develop an understanding among the students about MIS, its architecture with importance and various stages involved in MIS development.
- To understand the concept of Systems development life cycle (SDLC), BPR and ERP.
- To introduce about virtual organization concept, information security and cyber law.
- Make the students capable to identify, conceptualize, and develop solutions as a group for successful information systems management and present them.
- Make the students aware about concept of data mining, Business Intelligence (BI), Data Warehousing, Online Analytical Processing (OLAP) and Online transaction processing (OLTP).

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							THEORY			PRACTICAL	
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BCCA521	DSE	Information Systems for Management	4	0	0	4	60	20	20	0	0

Course Outcomes (Cos): At the end of the course, it is expected that students will be able to

- Understand the activities that are undertaken in acquiring an Information System in an organization.
- Understand Management Information Systems (MIS) and their role in today's organizations.
- Identify how MIS shapes and controls current (or prospective) jobs and how to use this insight to improve your own job performance and satisfaction and enhance future career prospects.
- Become familiar with the concept of BPR and ERP.
- Identify importance of data mining, Business Intelligence (BI), Data Warehousing, Online Analytical Processing (OLAP) and Online transaction processing (OLTP).

Syllabus:

UNIT-I

Introduction to Information Systems: Introduction to basic system concepts and its types, Data Vs Information, definition and Concept of an information system, Characteristics and Value of Information, Information System Resources, Importance of Information system for decision making and strategy building, Role of Information Systems in Society and organization, Constraints and Limitations of Information System.

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BCCA521	DSE	Information Systems for Management	4	0	0	4	60	20	20	0	0

UNIT-II

Introduction to MIS: Management, Information, System, Concepts of management information system, MIS evolution, MIS architecture, Need for MIS, functions of MIS, Planning techniques of MIS, Limitations of MIS, Types of Information System: Transaction Processing Systems, Office Automation Systems, Decision Support Systems, Executive Information System.

UNIT-III

Development of Information System: Different steps in Systems development life cycle (SDLC) like Planning, Analysis, Design, Implementation, maintenance and review.

Management of Enterprise Resources: Enterprise Resource Planning (ERP): Introduction and Implementation of ERP. Business process reengineering (BPR): Introduction and Process of BPR.

UNIT-IV

Management Trends: Trends in management and organizations, movement towards flexible, virtual organizations with advantages and disadvantages, MIS and mobile computing, MIS and social media. Information security and cyber law: Introduction.

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCCA521	DSE	Information Systems for Management	4	0	0	4	60	20	20	0	0

UNIT-V

Data Mining: Introductions and name of its applications. Business Intelligence (BI): introduction, features and name of tools used for decision making, Data Warehouse: Introduction, features and name of applications, Introduction of Online Analytical Processing (OLAP) and online transaction processing (OLTP).

Text Books:

1. Kenneth C. Laudon& Jane P. Laudon (2019), 'Essentials of Management Information Systems', Pearson Prentice-Hall, 13th Edition.
2. James, A. O'Brien (2017). "Introduction to Information Systems", Tata McGraw Hill , 1 2th Edition.
3. 3.Goyal, D.P. (2014). "Management Information Systems:Managerial Perspectives", Macmillan India Ltd.
4. 4. McNurlin, Sprague &Bui(2009), "Information Systems Management in Practice", Prentice Hall, 8 th Edition.
5. Jawadekar, W. S. (2004). "Management Information Systems", Tata McGraw Hill.

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BCCA531	DSE	Data Mining and Warehousing	4	0	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject to build the mental makeup of the students for the field of data mining.
- Using simple and well drawn illustrations develop students skills to discover knowledge to support the decision making process.
- To make the students well versed with the latest trends in data warehousing and data mining.

Course Outcomes (Cos): The student will be able to

- Understand the basic principles, concepts and applications of data warehousing and data mining.
- Introduce the task of data mining as an important phase of knowledge recovery process.
- Ability to do Conceptual, Logical and Physical design of Data Warehouses, OLAP applications and OLAP deployment.
- Have a good knowledge of the fundamental concepts that provide the foundation of data mining.
- Design and implement a data warehouse or data mart to present information needed by management in a form that is usable for management client.
- Design and implement the data preprocessing solutions for different applications.
- Identify and use suitable data mining techniques for Knowledge Discovery.
- Develop dashboard solutions for presentation of knowledge.
- Explore the subject to start as a researcher

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BCCA531	DSE	Data Mining and Warehousing	4	0	0	4	60	20	20	0	0

UNIT – I

Data Mining: Introduction, Motivation, importance, Data type for Data Mining: relation Databases, Data Warehouses, Transactional databases, advanced database system and its applications, Data mining Functionalities: Concept/Class description, Association Analysis, classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems.

UNIT – II

Data Warehouse and OLAP Technology for Data Mining: Differences between Operational Database Systems and Data Warehouses, a multidimensional Data Model, Data Cube, Data Warehouse Architecture, data warehouse servers.

UNIT- III

Data Preprocessing: Introduction and need of data preprocessing, data preprocessing as a process, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Concept Description: Characterization and Comparison, Analytical Characterization.

UNIT – IV

Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases: different algorithms, the Apriori Partition, Dynamic Itemset Counting, Generating Association rules from Frequent items.

UNIT – V

Classification and Prediction and Cluster Analysis: Issues regarding classification and prediction,
Major Issues in Data Mining, Applications and Trends in Data Mining: Data Mining Applications, currently available tools.

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BCCA531	DSE	Data Mining and Warehousing	4	0	0	4	60	20	20	0	0

Text Books:

1. J. Han and M. Kamber, *Data Mining: Concepts and Techniques*, Morgan Kaufmann Pub., III Edition, 2011
2. Berson, *Data Warehousing, Data Mining and OLAP*, TMH, I Edition, 1997.
3. W.H. Inmon, *Building the Data Warehouse*, Wiley India, III Edition, 2005.
4. Anahory, *Data Warehousing in Real World,* Pearson Education, II Edition, 2012.
5. Adriaans, *Data Mining*, Pearson Education, I Edition, 2002.
6. A.K. Pujari, *Data Mining Techniques*, University Press, Hyderabad, IV Edition,2016