Shri Vaishnav Vidyapeeth Vishwavidyalaya

B.Tech.(CSE- Cloud and Mobile Computing -IBM)
Choice Based Credit System (CBCS) 2019-20
SEMESTER V

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	THEORY END SEM University Exam	THEORY Two Term Exam	THEORY Teachers Assessment*	PRACTICAL END SEM University Exam	PRACTICAL Teachers Assessment*
BTCS504	UG	Software Engineering and Project Management	3	0	2	4	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 10 marks.

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:
On 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
Nature of Software: Software Engineering, Software Process, A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models- Waterfall Model, Incremental Models, Evolutionary Models, Concurrent Models, Specialized Process Model, Unified Process, Personal and Team process Models, Process technology, Agile development.

UNIT–II
Functional and Non-functional Requirements: Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented Software Development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability.

UNIT–III

The Software Design Process: Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics.

UNIT–IV

Software Testing Strategies-Approach: Issues, Validation Testing and Their Criteria, System Testing, Alpha-Beta Testing, Debugging, Testing Conventional Applications, Testing Object Oriented Applications ,Testing Web Applications.

UNIT–V

Need and Types of Maintenance: Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasilibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance(SQA). Project Metrics.

Text Books:
1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Tata McGraw-Hill, Seventh edition, 2009.
2. Richard Fairley, "Software Engineering Concepts" –, Tata Mcgraw Hill, 2008.
3. Pankaj Jalote ,"An Integrated Approach to Software Engineering", Narosa Pub, 2005**.**
4. Richard H.Thayer,"Software Enginerring & Project Managements",Willey India

Reference Books:
1. Bernd Bruegge, Allen H. Dutoit," Object-Oriented Software Engineering" Using UML, Patterns, and Java, PEARSON Third Edition, 2017.
2. Waman S.Jawadekar,"Software Enginerring", TMH
3. Ian Sommerville, "Software Engineering", Seventh Edition, Pearson Education Asia, 2007.
4. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning.

List of Practical:
Select a topic of the project, then make the report on following points

1. System Analysis
    1.1. Identification of Need
    1.2. Preliminary Investigation
2. Feasibility Study
    2.1. Technical Feasibility
    2.2. Economical Feasibility
    2.3. Operational Feasibility
3. Literature Survey
    3.1. Work done by other
    3.2. Benefits
    3.3. Proposed Solution
    3.4. Technology used

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4. Software Engineering Approach
  4.1. Software Engineering paradigm Applied
    4.1.1. Description
    4.1.2. Advantage & Disadvantages
    4.1.3. Reasons for use
4.2 Requirement Analysis
    4.2.1 Software Requirement Specification
    4.2.1.1 Glossary
    4.2.1.2 Supplementary Specifications
    4.2.1.3 Use Case Model
    4.2.1.4 Comparative analysis documents
    4.2.2 Conceptual Level Activity Diagram
4.3 Planning Managerial Issues
    4.3.1 Planning Scope
    4.3.2 Project Resources
    4.3.3 Team Organization
    4.3.4 Project Scheduling
    4.3.5 Estimation
    4.3.6 Risk Analysis
    4.3.7 Security Plan
 4.4 Design
  4.4.1. Design Concept
  4.4.2. Design Technique
  4.4.3. Modeling
    4.4.3.1. ER Model
    4.4.3.2. DFD Model
      4.4.3.2.1. DFD Model Level-0 and 1
      4.4.3.2.2. DFD Model Level 2 and 3
    4.4.3.3. Data Dictionary
    4.4.3.4. Activity Diagram
    4.4.3.5. Software Architecture
4.5 Implementation Phase
  4.5.1. Language Used Characteristics
  4.5.2. Coding
4.6 Testing
  4.6.1. Testing Objectives
4.6.2. Testing Methods & Strategies used along with test data and the error listed for each test case for each function provided by the system.

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SEMESTER V

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*
BTCS503	UG	Computer Graphics and Multimedia	3	0	2	4	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 10 marks.

Course Objectives:
The student will have ability to:
1. Understood basic concepts of computer graphics.
2. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon.
3. Shall be able to perform processing of basic shapes by various processing algorithms /techniques.
4. Acquire knowledge about two and three dimensional transformations.
5. Shall be able to apply the transformation algorithms to the basic shapes.
6. Shall be able to perform Multimedia Operation.

Course Outcomes:
Upon completion of the subject, students will be able to:
1. Understood basic concepts of computer graphics
2. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon and shall be able to perform processing of basic shapes by various processing algorithms /techniques.
3. Acquire knowledge about two and three dimensional transformations and shall be able to apply the transformation algorithms to the basic shapes.
4. Shall have the basic knowledge of windowing and clipping and shall be able to apply various algorithms of clipping.
5. Acquire knowledge about Visible Surface Detection methods, Illumination Models and Surface Rendering
6. Acquire knowledge to apply advanced techniques such as fractals, introduction to open GL and Multimedia Systems.

SYLLABUS
UNIT I
Introduction to Computer Graphics:- What is Computer Graphics?, Where Computer Generated pictures are used, Elements of Pictures created in Computer Graphics Graphics display devices,Graphics input primitives and Devices.**Introduction to openGL:-** Getting started Making pictures, Drawing basic primitivesSimple interaction with mouse and keyboard

UNIT II

Points and Lines, Antialiasing**Line Drawing Algorithm:-**DDA line drawing algorithm, parallel drawing algorithmBresenham's drawing algorithm with example.

Circle and Ellipse generating algorithms:-Mid-point Circle algorithm with example

Mid-point Ellipse algorithmMid-point Ellipse algorithm with example **Parametric Cubic Curves:-**Bezier curvesB-Spline curves

Filled Area Primitives:-Scan line polygon fill algorithm, Pattern fill algorithm

Inside-Outside Tests, Boundary fill algorithms, Flood fill algorithms

UNIT III
2D Geometric Transformations

Basic transformation, Matrix representation and Homogeneous Coordinates Composite transformationOthertransformations.Transformation between coordinated systems.Window to Viewport coordinate transformation,

Clipping operations – Point clipping, Line clipping:-Cohen – Sutherland line clippingLiang – Barsky line clippingMidpoint subdivision

Polygon Clipping-Sutherland – Hodgeman polygon clippingWeiler – Atherton polygon clipping.3D object representation methods B-REP , sweep representations , CSG

Basic transformations-Translation,Rotation, Scaling

Other transformations-Reflection,Rotation about an arbitrary axis Composite transformations Projections – Parallel and Perspective 3D clipping

UNIT IV
3D Geometric Transformations and 3D Viewing   Classification of Visible Surface Detection algorithm:-Translation,Rotation, Scaling

Other transformations:-Reflection,Rotation about an arbitrary axis Composite transformations Projections,Back Surface detection method Depth Buffer method Scan line method BSP tree method, Area Subdivision method.

UNIT V

Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards.i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG,Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP,MOV, MPEG , compression standards, compression through spatial and temporal redundancy. Multimedia Authoring .

TEXT BOOKS:
1. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
2. Parekh "Principles of Multimedia" Tata McGraw Hill
3. Prabhat k Andleigh, KiranThakral , "Multimedia System Design " PHI Pub.
4. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.

REFERENCES:
1. Computer Graphics, C Version, 2e Paperback – 2002
2. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.
3. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.
4. David F Rogers, "Procedural elements for Computer Graphics", Tata McGraw Hill, Second Edition.

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5. Foley, VanDam, Feiner and Hughes, "Computer Graphics Principles & Practice in C", Second edition, Pearson Education.
6. David Hillmaa, "Multimedia Technology & Applications, Delmar, 1998.

LIST OF EXPERIMENTS:
1. Implement DDA Line Drawing algorithm
2. Implement Bresenham's line drawing algorithm.
3. Implement Mid-Point circle drawing algorithm.
4. Implement Mid-Point ellipse drawing algorithm.
5. Implement cubic Bezier curve.
6. Implement a menu-driven program for 2D transformations.
7. Implement Line clipping algorithm using Cohen-Sutherland.
8. Implement Polygon Clipping using Sutherland Hodgeman.
9. Implement Scan line fill algorithm.
10. Study of Multimedia and Program for Flash.

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SEMESTER V

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BTIT611	UG	Information Storage and Management	2	1	0	3	60	20	20	0	0

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 10 marks.

Course Objectives:
1. An ability to understand various storage architecture & technologies.
2. An ability to understand various technologies used to provide backup & recovery.
3. An ability to understand various techniques used to provide security.
4. Ability to identify information storage system requirements.
5. An ability to develop policy for information storage system.
6. An ability to develop policy for backup& recovery.

Course Outcomes:
 On completion of the course students will be able to:
1. Describe & apply storage technologies.
2. Identify storage technologies that provide cost effective IT solution for medium to large scale businesses & data centers.
3. Manage Virtual Server & Storage between Remote locations.
4. Design analysis and manage clusters of resources.

Syllabus

Unit-I:
Introduction: Digital data and its types, Information storage, Key characteristics of data center, Evolution of computing platforms. Introduction to storage technology: Data Proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information life Cycle Management, Data categorization.

Unit-II:
Storage System Architecture: Intelligent disk subsystems overview, Contrast of integrands modular array, Component Architecture of Intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

Unit-III:
Introduction to network storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison, Applications, Elements, Connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN

Unit-IV:
Hybrid storage solutions and virtualization: memory, network, server, storage & appliances.

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Data centre concepts & requirements, Backup and disaster recovery. Industry Management standards, standard framework applications, Key management metrics.

Unit-V:

Information storage on clouds: concept of cloud, cloud computing, storage on cloud, Cloud benefits, Cloud computing evolution. Application & services on cloud, cloud service providers, cloud deployment models, Essential characteristics of cloud computing.

TEXT BOOK:
1. G.Somasundaram & Alok Shrivastava editors, ISM: Storing, Managing, and Protecting Digital Information; Wiley India

REFERENCE BOOKS:
1. Saurabh; Cloud Computing : Insight into New era Infrastructure; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained: Basic and application of fiber channels, SAN, NAS, ISESI, INFINIBAND and FCOE, Wiley India.
3. Sosinsky, Cloud Computing Bible, Wiley India.

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SEMESTER V

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	THEORY END SEM University Exam	THEORY Two Term Exam	THEORY Teachers Assessment*	PRACTICAL END SEM University Exam	PRACTICAL Teachers Assessment*
BTIT513	UG	Management Information System	2	1	0	3	60	20	20	0	0

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 10 marks.

Course Objectives:
1. To Understand types of MIS applications in organizations
2. To discuss the development of management information systems in organizations.
3. To Select and design MIS systems appropriate to meet management requirements.
4. To Critically evaluate MIS contributions to the strategic management of organizations

Course Outcomes:
1. To understand MIS in both the wider managerial context and in the narrower confines of the selection, support, design and development of computer applications
2. To focus on the concepts a manager's needs to understand, in order to make effective use of, computerized information systems

SYLLABUS

UNIT–I
Organizations and Computing: Introduction, Modern Organization-IT enabled- Networked-Dispersed- Knowledge Organization, Information Systems in Organizations- what are information systems?, Brief history of computing- ENIAC: Way to commercial computers-Advent of artificial intelligence- advent of personal computing-Free Software Movement-Advent of Internet, The role of internet- Internet and Web: they are different-the internet changes everything

UNIT–II
Managing Information Systems in Organizations: Introduction, Managing in the Internet Era, Managing Information Systems in Organization-the IT interaction model, Challenges for the manager-what information to build?-how much to spend on information systems?-what level of capabilities should be created with information systems?-how centralized should the services be?-what security levels are required?-what is technology road map for the organization?

UNIT–III
Data and Information: Introduction, data and information- measuring data, information as a resource, information in organizational functions, types of information technology, types of information systems- transaction processing systems-management information system.

UNIT–IV

Decision making and communication: Introduction, Decision making with MIS-Tactical decisions-operational decisions-strategic decisions, communication in organizations- types of communication- examples of communications in organizations- decision making with communication technology

UNIT–V

Strategy: Introduction, Information goods-properties-technology lock-in and switching costs-network externalities-positive feedback-tippy markets, information systems and competitive strategy- value chain, the Role of CIO-information system's plan-vendor coordination-technology updates-return on investment on technology.

TEXT BOOKS:
1. Kenneth C. Laudon& Jane P. Laudon, Essentials of Management Information Systems, Tenth Edition, Pearson Prentice, Hall, 2012
2. Terry Lucey, Management Information Systems, Ninth Edition, 2005, Thompson.

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							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIT712	UG	Enterprise Resource Planning	2	1	0	3	60	20	20	0	0

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 10 marks.

Course Objectives:
The objective of this course is to help students to understand the basics of ERP, its uses and its application.

Course Outcomes:
Students to understand the basics of ERP, its uses and its application in present business scenario.

Syllabus

Unit I: Introduction to ERP
1. Enterprise Resource Planning –Introduction
2. Need of ERP
3. Advantages of ERP
4. Growth of ERP

Unit II: ERP and Related Technologies
1. Business process Reengineering (BPR)
2. Management Information System (MIS)
3. Decision Support Systems (DSS) Executive Support Systems (ESS)
4. Data Warehousing
5. Data Mining
6. Online Analytical Processing (OLTP)
7. Supply Chain Management (SCM)
8. Customer Relationship Management (CRM)

Unit III: Modules of ERP
1. ERP modules & Vendors Finance Production planning, control & maintenance Sales & Distribution Human Resource Management (HRM)
2. Inventory Control System.
3. Quality Management ERP Market

Unit IV: ERP Implementation
1. ERP Implementation Life Cycles Evaluation and selection of ERP package

2. Project planning Implementation
3. Team training & testing
4. End user training & Going Live
5. Post Evaluation & Maintenance.

Unit V: Post implementation of ERP
1. ERP Case Studies Post implementation review of ERP Packages in Manufacturing Services

REFERENCES:
1. Leon, A. (2008). Enterprise Resource Planning. New Delhi; Tata McGraw-Hil Education
2. Kumar, V., Venkitakrishna, N. K. (1998). ERP - Concepts and Practice. New Delhi; PHI
3. Garg, Venkitakrishnan (2003).ERP Concepts and Planning. New Delhi; PHI Learning.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BTIT511	UG	**Wireless Communication Networks**	2	1	0	3	60	20	20	0	0

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 10 marks.

Course Objectives:
The student will have ability to:
1. Understand the fundamental of wireless communication system.
2. Describes radio propagation models and wireless channel effects.
3. Knows fundamental concept of cellular radio concepts.
4. Explains various wireless communication network systems, standards and applications.

Course Outcomes:
On completion of the subject, students will be able to:
1. Demonstrate wireless communication systems design and working.
2. Investigate various advanced techniques for wireless communications.
3. Constructs design architectures for different Wireless Systems.
4. Evaluates the emerging trends in Wireless communication.

SYLLABUS

UNIT–I
Introduction to Wireless Communication System: Evolution of mobile communications, Mobile Radio System around the world, Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal communication. Second generation Cellular Networks, Third Generation (3G) Wireless Networks ,Wireless Local Loop(WLL),Wireless Local Area network(WLAN),

UNIT–II
The Cellular Concept- System Design Fundamentals: Cellular system, Hexagonal geometry cell and concept of frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio, Channel &co-channel interference reduction factor, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Hand off Strategies, Umbrella Cell Concept, Trunking and Grade of Service, Improving Coverage & Capacity in Cellular System-cell splitting, Cell sectorization, Repeaters, Micro cell zone concept, Channel antenna system design considerations.

UNIT–III
Mobile Radio Propagation Model, Small Scale Fading and diversity: Large scale path loss:-Free Space Propagation loss equation, Path-loss of NLOS and LOS systems, Reflection, Ray ground reflection model, Diffraction, Scattering, Link budget design, Max. Distance Coverage

formula, Empirical formula for path loss, Indoor and outdoor propagation models, Small scale multipath propagation, Impulse model for multipath channel, Delay spread, Feher's delay spread, Types of small scale Fading, Rayleigh and rician distribution.

UNIT–IV
Multiple Access Techniques: Introduction, Comparisons of multiple Access StrategiesTDMA, CDMA, FDMA, OFDM, CSMA Protocols. Mobile Network And Transport Layers :Mobile IP , Dynamic Host Configuration Protocol, Mobile Ad Hoc Routing Protocols, Multicast routing,TCP over Wireless Networks , Indirect TCP , Snooping TCP , Mobile TCP .Wireless Systems: GSM system architecture, Radio interface, Protocols, Localization and calling, Handover, Authentication and security in GSM, GSM speech coding, Concept of spread spectrum, CDMA forward channels, CDMA reverse channels, Soft hand off, CDMA features, Power control in CDMA, Performance of CDMA System, GPRS system architecture.

UNIT–V
Introduction to Wi-Fi, WiMAX, Zig-Bee Networks, Software Defined Radio, UWB Radio, Wireless Adhoc Network and Mobile Portability, Security issues and challenges in a Wireless network. Application Layer :WAP Model, Mobile Location based services ,WAP Gateway ,WAP protocols wireless bearers for WAP , WML ,WMLScripts.

TEXT BOOKS:
1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education,
2. William Stallings, "Wireless Communications and Networks", Pearson Education.
3. William D Stanley : Network Analysis with Applications, Pearson Education.
4. Roy Choudhary D: Network and systems, New Age Publication.
5. Wireless Communication, Theodore S. Rappaport, Prentice hall

REFERENCE BOOKS:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", First Edition, Pearson Education, 200UNIT III.
2. Uwe Hansmann,Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 200UNIT III.
3. C.K.Toh, "AdHoc Mobile Wireless Networks", First Edition, Pearson Education, 2002.
4. Wireless digital communication, Kamilo Fether PH.

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BTIBM601	UG	Micro services Architecture and Implementation	3	0	2	4	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 10 marks.

Course Objectives:
The student will have ability to:

1. Learn how Microservices have evolved over time.
2. Perform migration of monolithic application into microservices architecture.
3. Develop microservices using container technology like Docker.
4. Develop understanding of container orchestration like Kubernates.
5. Deploy application on Kubernates.

Course Outcomes:
After the successful completion of this course students will be able to:

1. Understand the need of micro services.

2. Understand the transformation journey from Monolithic application to micro services.

3. Develop understanding of connecting database using Mongo DB.

4. Develop understanding of Container and docker.

5. Develop understanding of Kubernates.

6. Understanding cloud application Kubernates architecture.

7. Deploying application on Kubernates

Syllabus:
UNIT I Introduction to Micro services: Motivation for Micro services, What is monolithic application? Domain Driven Design, Edge Service, Dealing with complexity, Micro services Security, API management and gateways, the future of Micro services, Micro services Governance, Summary of Micro services.

UNIT II   Web App development using NodeJs: Introduction to NodeJs, Getting Started with NodeJs, Project Structure, Basic Routing, File system, View templates Serving static content, Handling HTTP and HTTPS, Connecting to database, Mongo DB Installation and Database, Node Js Mongo driver, Performing CRUD operations, Connecting Pooling, Connecting Pooling using NodeJS mongo driver, Performing CRUD operations, Connecting Pooling, Connecting Pooling using NodeJS mongo driver.

UNIT III Containers and Dockers: Containers and Dockers, Basic Docker commands, Dev versus Ops, The Twelve-Factor App, Docker mission, Docker Adoption, Docker basic concept, Docker architecture, Docker typical workflow, Docker shared and layered file systems technology, container ecosystem and orchestration.

Unit IV Kubernates: what is kubernates strength and architecture, Master & worker node component, kubernate building blocks, Deploying Applications on kubernates, Helm, Application center components, PoD health checking, Health check and kubectl example, Cloud application component architecture, Benefits of using Kubernetes with IBM container.

Unit V: Case Study: The Journey from Monolith Architecture to Micro services; Refactoring A Monolith application Into A Cloud-Native App.

TEXT BOOKS:
1. IBM Career Education – *"Microservices Architecture and Implementation"*
2. Sam Newman, *"Building Microservices"*, O'reilly Publication.

REFERENCES:
1. NodeJS: https://nodejs.org/documentation/
2. Express: http://express.com/4x/api/html
3. MOngoDB: http://docs.mongodb.org/manual/contents/
4. Microservics: https://www.tutorialspoint.com/microservice_architecture/index.htm
5. Deploy a microservices app on IBM Cloud by using Kubernetes: https://www.ibm.com/cloud/garage/tutorials/microservices-app-on-kubernetes/

LIST OF EXPERIMENTS:
1. Study of Docker components- Docker image, Docker container, Docker hub and Docker engine.
2. Installation of Docker on windows OS.
3. Study and perform basic Docker commands.
4. Creating a Docker Image.
5. Pushing the Image to a Repository(Docker Hub).
6. Deploying the Image to a Docker host.
7. Study of Kubernates architecture.
8. Deploying application on Kubernates

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Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
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B.Tech.(CSE- Cloud and Mobile Computing -IBM)
Choice Based Credit System (CBCS) 2019-20
SEMESTER V

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	THEORY END SEM University Exam	THEORY Two Term Exam	THEORY Teachers Assessment*	PRACTICAL END SEM University Exam	PRACTICAL Teachers Assessment*
BTIBMC501	UG	Block chain and Applications	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 on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

This course will help the students in:

1. Understanding the Blockchain technology and the key concepts like cryptography and cryptocurrency concepts.
2. Gain a deep insight into Bitcoin, its network and how Bitcoin transactions are validated by miners.
3. Interpret the prospects of Blockchain and assess how Blockchain can improve your business standards.
4. Deploy your private Blockchain on the web where you can visually see your chains & send transactions between nodes.
5. Infer Hyperledger project, its architecture, APIs and network topology.

Course Outcomes:

After the successful completion of this course students will be able to:

1. Understand how blockchain solutions are transforming the industry landscape.
2. Develop a deeper understanding of blockchain technical topics such as consensus, cryptography, privacy and security.
3. Acquire hands-on expertise using popular blockchain open source technology, including Hyperledger Fabric.
4. Design and develop for a permissioned blockchain.
5. Explore a variety of blockchain case studies, including food provenance, container tracking, payments and identity.

Syllabus:

UNIT I
Blockchain prerequisites and Introduction to Blockchain: Introduction to HTML 5 and Javascript Programming, Concept of callback, promises and Async/Await, NodeJS- Server side Javascript, Docker essentials, Containers Orchestration, Implementations Creating and Deploying Docker containers, Introduction to Blockchain.

UNIT II

Blockchain in detail and Blockchain Status: Understand the business context behind Blockchain and the problems that blockchain aims to solve, Distinguish between blockchain for business and other blockchain implementations, Enumerate the broad categories of blockchain solutions, Understand the state of the blockchain industry in 2019, in terms of technologies, topics and communities, See how today's blockchain implementations vary, Look at the indicators that point to blockchain's future.

UNIT III

Linux Foundation Hyperledger and Blockchain Use-Cases: Understand the background behind the Linux Foundation Hyperledger project, Enumerate and compare the different Hyperledger projects, Introduce Hyperledger Fabric, Learn about some successful blockchain projects, Evaluate good vs. bad blockchain ideas, Assess business value.

Unit IV
Blockchain Developer part 1:- Block chain principles and its use in the enterprise, Blockchain infrastructure and applications, Identify participants, assets, transactions in a business network, Hyperledger Fabric, Blockchain solution architecture, Peers, smart contracts, channels, world State.

Unit V:
Blockchain Developer part 2:- Consensus, ordering service and transaction endorsement, Chaincode structure, lifecycle and deployment approaches, Blockchain deployment with Docker and Kubernetes, Blockchain security on Hyperledger Fabric.
PROJECT: Research Activities on Blockchain network.

TEXT/REFERENCE BOOKS:

1. IBM Courseware.

Further Suggested Readings:

1. Implementing Blockchain solutions using Hyperledger.

LIST OF EXPERIMENTS:
1. Implementation of java script concepts.
2. Implementation of call-back functions v/s promises v/s Async & Await.
3. Implementation of Node.js concepts.
4. Creating and deploying Docker containers.
5. Car Auction Blockchain App.
6. Analyze Commercial Paper Guide.
7. Understanding Cryptography Guide using java script and Node.js.
8. Setting up Blockchain Development Environment using IBM Blockchain platform extension.
9. Smart Contract and Client App development.
10. Blockchain Applications Guide – Connecting to an existing network.

Project Statement:

Deploy your private Blockchain on the web where you can visually see your chains & send transactions between nodes and experience teamwork agile industry practices using Design Thinking.

Car Auction Blockchain App - Today, each participant (for example, manufacturer, insurer or regulator) has their own ledger and the processes that allow them to interact with each other varies from company to company and can be time consuming to complete.

Connectivity between participants is typically done point-to-point using a variety of processes – some manual or slow (e.g. sending a letter), and some automated (e.g. file, REST API, B2B messaging).

This plethora of processes is expensive to maintain and can be vulnerable to attack.

Blockchain Use Justification

In this scenario we will replace these disparate ledgers with a single blockchain, and the individual business processes with a single shared one. By doing this we will make the overall process much quicker and less prone to error.

We will experience the solution through the eyes of four key members of the business network: a private purchaser, the manufacturer, the regulator and the insurer.

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| COURSE CODE | CATEGORY | COURSE NAME | L | T | P | CREDITS | 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;
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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, Hashtables. 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.

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

REFERENCES:
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 EXPERIMENTS:
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 my Sum that takes a list as a parameter and returns the accumulative sum.

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BTCS607	UG	Scripting Languages	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 on 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 different types of scripting languages.
2. To gain knowledge about client side scripts and server side scripting.
3. To learn about PHP, PERL and Python languages and their usage in implementation.
4. To build web application project using scripting languages.

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

SYLLABUS

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

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

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

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

expression, subroutine.

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

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

REFERENCES:
1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Pen and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1,l.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Pen by Example, E.Quigley, Pearson Education.
8. Programming Perl,Larry Wall, T.Christiansen and J.Orwant,O'Reilly, SPD.
9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice HalI(Pearson).
11. Perl Power, J.RFlynt, Cengage Learning.
12. PHP Programming solutions, V.Vaswani, TMH.

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