



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE- Full Stack Development & Block chain -IBM)

Choice Based Credit System (CBCS) 2020-21

SEMESTER V

| SUBJECT CODE | Category | SUBJECT NAME | TEACHING & EVALUATION SCHEME | | | | | | | | |
|----------------|------------|--|------------------------------|---------------|----------------------|-------------------------|----------------------|----|---|---|----------|
| | | | THEORY | | | PRACTICAL | | Th | T | P | CRED ITS |
| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BTCS504 | DCC | Software Engineering and Project Management | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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

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

Course Educational Objectives (CEOs):

The student will have ability to:

1. Get the knowledge of basic software engineering methods and practices.
2. Define software requirements and requirement engineering.
3. Apply approaches for various design and their principle.
4. Explore testing in various domain.
5. Development of significant teamwork and project based experience.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

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

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Syllabus

Unit I

10HRS

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

9HRS

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

8HRS

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.

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Unit-IV

7HRS

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

8HRS

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, Feasibility 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.

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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

References:

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.

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List of Experiments:

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
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

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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

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

Course Educational Objectives (CEOs):

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 (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. 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.

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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

10HRS

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 primitives Simple interaction with mouse and keyboard

Unit II

9HRS

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

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

Curves:-Bezier curves
B-Spline curves

Filled Area Primitives:-Scan line polygon fill algorithm, Pattern fill algorithm
Inside-Outside Tests, Boundary fill algorithms, Flood fill algorithms

Unit-III

8HRS

2D Geometric Transformations

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

Clipping operations – Point clipping, Line clipping:-Cohen – Sutherland line clipping
Liang – Barsky line clipping
Midpoint subdivision

Polygon Clipping-Sutherland – Hodgeman polygon clipping
Weiler – 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

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Unit-IV

7HRS

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

8HRS

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.

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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.
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.

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9. Implement Scan line fill algorithm.
10. Study of Multimedia and Program for Flash.

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| BTIT603 | DCC | Cyber and Network Security | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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

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

Course Educational Objectives (CEOs):

The student will have ability:

1. To gain a fundamental knowledge of Cyber crime and Network Security.
2. To gain a fundamental understanding of a Cyber-attack and Challenges in identify and prevent them from occurring.
3. To gain a fundamental knowledge of Tools and Methods used in Cyber crime for prevention.
4. To understand the need of Cyber law and the fundamental concepts of Cyber Forensic.
5. To provide the fundamental skills and understanding needed to identify Cyber Security threats.

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. Identify physical points of vulnerability in simple networks and security needs of an organization.
2. Evaluate the Legal Perspective of Cybercrime and Cyber Security.
3. Formulate, update and communicate short- and long-term organizational cyber-security strategies and policies.
4. Troubleshoot, maintain and update an enterprise-level information security system.
5. Investigate the Cybercrime with the help of Cyber Forensic.

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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.

Syllabus

Unit I

10HRS

Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security mechanism, Fundamental Security Design Principles, Attack Surface and Attack trees, A Model for Network Security. Introduction to Cybercrime, Cybercrime and Information Security, Classification of Cybercrimes: The Legal Perspective, Cybercrime: An Indian Perspective.

Unit II

9HRS

Introduction to Cyber offence, How Criminal plan the attack, Social Engineering, Cyber stalking, Cyber café and cybercrime, Botnets: The fuel of cybercrime, Attack vector, cloud computing. Cybercrime: Mobile and Wireless devices, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Setting for Mobile Devices, Authentication Service Security, Attack on Mobile Phones.

Unit-III

8HRS

Tools and Methods Used in Cybercrime, Proxy Server and Anonymizers, Phishing and Identity Theft, Password Cracking, Keylogger and Spyware, Virus and Worms, Trojan Horse and Backdoors, Steganography DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attack on Wireless Networks.

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Unit-IV

7HRS

Cybercrime and the Legal Landscape around the World, Why Do We Need Cyber laws, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Information Technology Act, Digital Signature and the IT Act, cybercrime and punishment.

Introduction to Cyber Forensics, Historical Background of Cyber Forensics, Cyber Forensics and Digital Evidence, Forensic Analysis of E-Mail, Digital Forensic Life Cycle, Approaching Computer Forensic Investigation, Relevance of OSI Model to Computer Forensic, Challenges in Computer Forensic.

Unit-V

8HRS

Network Access Control and Cloud Security, Transport- Level Security, Wireless Network Security, Electronic Mail Security, IP Security.

TEXT BOOKS:

1. William Stallings, “Cryptography and Network Security: Principles and Practice”,7th Edition Pearson,2017
2. Sunit Belapure, Nina Godbole “Cyber Security”,1st edition, Wiley Publication, 2011

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REFERENCES:

1. Carl Endorf, Eugene Schultz, Jim Mellander“Intrusion Detection&Prevention”,1stEdition,TMH,2007
2. Neal, Krawetz, Introduction to Network Security,1st Edition ,Cengage Learning,2006
3. Atul Kahate,“Cryptography and Network Security”,McGraw Hill,,2009
4. Charlie Kaufman, Radia Perlman, Mike Speciner, Michael Speciner, “ Network Security - Private communication in a public world” ,2nd Edition,TMH,2002
5. Fourozon, “Cryptography & Network Security” 4thEdition ,TMH,2005
6. Mayank Bhushan “Fundamentals of Cyber Security”,1st Edition ,BPB Publication,2017
7. GauravGupta,Sarika Gupta “Information Security and Cyber Laws”,1st Edition,Khanna Book Publishing,2011.

List of Practical's:

1. Compare the security features of at least three web browsers.
2. Write study and installation of wireshark.
3. Implementation Symmetric Encryption technique Ceaser Cipher .
4. Implementation Symmetric Encryption technique polyalphabetic substitution.
5. Asymmetric Encryption technique implementation.
6. Study and execution of networking commands.

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7. Study and working of telnet.
8. Study and installation of cisco packet tracer.
9. Social media data analytics for any website.
10. Case study of current IT act related cases.
11. Case study of social networking related crimes.
12. Finding out the vulnerable data on Social Networking sites.
13. Find out attacks on Social networking sites.
14. Write the features of any social media dataset used for data analytics.
15. Data Analytics on Social Media website
16. Write features of any Social media data analytics tools available free online. (Likealyzer, Facebook or any other tool)
17. Study of the features of firewall in providing network security and to set Firewall Security in windows.
18. Study of different types of vulnerabilities for hacking a websites / Web Applications.
19. Analysis the Security Vulnerabilities of E-commerce services.
20. Analysis the security vulnerabilities of E-Mail Application.

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| BTIBM 402 | DCC | Cyber Physical System Using IoT | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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

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Course Educational Objectives (CEOs):

The objective of this course is to teach students about:

1. Understand the evolution and impact of IoT in the world today.
2. Explore IoT by industry domains: automotive, connected homes, manufacture, energy & utilities, transportation, healthcare, aerospace.
3. Explore end-to-end case studies for every key IoT industry and identify common patterns.

Course Outcomes (COs):

At the end of the course, students shall be able to:

1. Understand technical aspects of IoT solutions: devices and networks, data, cloud, applications, blockchain, analytics and security.
2. Build cognitive IoT solutions, leveraging artificial intelligence and data science.
3. Understand industry practices to design and build agile IoT solutions, using the design thinking methodology.
4. Work in team's jointly exploring real-world IoT scenarios.
5. Prototype bespoke IoT solutions leveraging industry-proven concepts, technologies and methodologies

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Syllabus:

UNIT I

10HRS

IoT Global LANDSCAPE: What is the Internet of things, IoT global adoption, IoT common Patterns: sensor, data, analytics, IoT challenges: security and scalability, Resources.

UNIT II

8HRS

IoT Application Domains: IoT Technology Domains, Connected Devices, Connected Vehicles, Smart Buildings, Smart Cities, Resources

UNIT III

8HRS

IoT Solution Anatomy – Device and Networks: IoT Solution Architecture, Physical Layer (Devices, Hardware, Sensors), Communication layer (IoT networks), Resources

Unit IV

8HRS

IoT Solution Anatomy – IoT Data Platform: IoT Platform Layer, Data Analytics and applications Layer, Resources

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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.

UnitV:

8HRS

Cognitive IoT Solutions: IoT Sensor Data and AI, Data Science on the Cloud, Resources

IoT Industry Case Studies: IoT Trends, IoT in Manufacturing, Global Logistics with IoT, Worker Safety, Industry Predictions, Resources

TEXT BOOKS:

1. Vijay Madiseti, ArshdeepBahga, "Internet of Things A Hands-On- Approach", 2014, ISBN:978 0996025515
2. Adrian McEwen, Hakim Cassimally "Designing the Internet of Things", John Wiley & Sons (2013), ISBN - 9781118430620
3. IBM Skills Academy

REFERENCES:

1. Daniel Kellmerit, "The Silent Intelligence: The Internet of Things". 2013, ISBN 0989973700
2. Massimo Banzi, "Getting Started with Arduino", O'Reilly Media, Inc." (2011), ISBN-9781449309879
3. Richard Grimmett, "Raspberry Pi Robotics Essentials", Packt Publishing Ltd (2015), ISBN-978178528564

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LIST OF EXPERIMENTS:

1. Remote Sensor Data Visualization: Preface, Remote Sensors
2. IBM Cloud Account Creation and Device Setup: Preface, Obtain an IBM Cloud Account, Provision the Node-Red App, Register a new Device
3. Node-RED setup & Chart Data: Preface, Node-RED setup, Receive Environmental Sensor Data in Node-RED, Dashboard Charts – Plot Sensor Data
4. Store Data in Cloudant Storage & Chart Data: Preface, Import the Node-RED Cloudant storage flow, Chart Historical Sensor Data
5. Use IoT Sensor Data to track Zebras in Botswana with AI: Preface, Clone & Deploy, Create Services, Run the Application, Links
6. Analyze large Data Sets Collected from a Long-range IoT System: Preface, Create Services, and Run Watson Studio Notebook.

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| BTIBM506 | DCC | Block chain and Applications | 60 | 20 | 20 | 30 | 20 | 3 | 0 | 2 | 4 |

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

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

Course Educations Objectives (CEO):

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 (CO):

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.

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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.

- Design and develop for a permissioned blockchain.
- Explore a variety of blockchain case studies, including food provenance, container tracking, payments and identity.

Syllabus:

UNIT I

10HRS

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

8HRS

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.

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UNIT III

8HRS

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

8HRS

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

8HRS

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.

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TEXT/REFERENCE BOOKS:

1. IBM Courseware.

Further Suggested Readings:

1. Implementing Block chain solutions using Hyper ledger.

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.

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Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE- Full Stack Development & Block chain -IBM)

Choice Based Credit System (CBCS) 2020-21

SEMESTER V

| SUBJECT CODE | Category | SUBJECT NAME | TEACHING & EVALUATION SCHEME | | | | | | | | |
|----------------|------------|--------------------------------|------------------------------|---------------|----------------------|-------------------------|----------------------|----|---|---|----------|
| | | | THEORY | | | PRACTICAL | | Th | T | P | CRED ITS |
| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BTCS407 | DCC | Programming with Python | 0 | 0 | 0 | 60 | 40 | 0 | 0 | 4 | 2 |

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 Educational Objectives (CEOs):

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 (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. 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.

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Syllabus

Unit I

10HRS

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

9HRS

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

8HRS

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

7HRS

Some simple Algorithms and Data Structures: Search Algorithms, Sorting Algorithms, Hashtables. Plotting and more about Classes: Plotting using PyLab, Plotting mortgages and extended examples.

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Unit-V

8HRS

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

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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.

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| BTCS607 | DCC | Scripting Languages | 0 | 0 | 0 | 60 | 40 | 0 | 0 | 4 | 2 |

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Course Educational Objectives (CEOs):

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 (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. 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.

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Unit I

10HRS

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

9HRS

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

8HRS

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

7HRS

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.

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Unit-V

8HRS

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, 3rd 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.

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9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice Hall(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.

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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.

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