



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited A++ Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

1.1.3 Courses having focus on employability/ entrepreneurship/ skill development

B.E Computer Science and Engineering With Specialization In Blockchain Technology			
Employability			
S.No	Course Code	Course Name	Page No
	SCSA1517	Ethics law and policy	2
	SCSA1518	Enterprise Blockchain Platforms	4
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Skill Development			
	SCSA2509	Network Security Lab	12
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	SCSA2611	DevOps Lab	14
Entrepreneurship			
	S613APT1	Professional Training 1	

SCSA1517	ETHICS, LAW AND POLICY	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To describe the cyber Ethics.
- To explain about the various cyber Laws.
- To Analyse various types of cyber security policy catalog.
- To understand the secure and trust cyber space.
- To Learn the Indian laws related to cyber security
- To Know the ethics, law and policy following the cyber data.

UNIT 1 INTRODUCTION OF CYBER ETHICS

9 Hrs

Introducing Ethics, Cyber Ethics, Ethical issues in cyber security, Ethics, Law, and Policy: How Are They Different, How Are They Linked?, Policy and Law, Making and Analysing Policy, Law as a Toolbox for Policy; Ethics as Its Foundation, Disability Policy and Law, What's Wrong With Calling It "Disability Law and Policy"?, Disability Policy and the Models of Disability, The Social Model of Disability, The Social Model and the Rights Approach, Enduring Themes of Disability Policy and Law, Disability Ethics.

UNIT 2 INTRODUCTION TO CYBER LAWS

9 Hrs

Repair Deemed Unlawful, CyberLaw (May 1993), Free Speech & Toasters, CyberLaw (Oct. 1993), The End of Fair Use, CyberLaw (Nov. 1993), Pirates, CyberLaw (April 1994), Information & Infrastructure, CyberLaw (July 1994), Apple Loses, CyberLaw (Sept. 1994), Photocopying Unlawful, CyberLaw (Dec. 1994), Methods of Operation, CyberLaw (March 1995), Internet Infringement, CyberLaw (April 1995), Restraining Access, CyberLaw (June 1995), Government Recommendations, CyberLaw (Sept. 1995), Notice of Infringement, CyberLaw (Nov. 1995), Losing Data, CyberLaw (Jan. 1996), Online Defamation, CyberLaw (May 1995)

UNIT 3 CYBER SECURITY POLICY CATALOG

9 Hrs

What Is Cyber Security Policy?, Domains of Cyber Security Policy, Laws and Regulations, Enterprise Policy, Technology Operations, Technology Configuration, Strategy versus Policy, Cyber security Policy Taxonomy, cyber Governance Issues, Cyber User Issues, Cyber Conflict Issues, Cyber Management Issues, Cyber Infrastructure Issues, Government's Approach to Cyber Security Policy, A Brief History of Cyber Security Public Policy Development in the U.S. Federal Government

UNIT 4 SECURITY AND TRUST IN CYBER SPACE

9 Hrs

Introduction, threat of cybercrime in the financial sector, types of cybercrime in financial institutions, bases for trust building, national culture and trust, trustworthiness: could it be demonstrated?, antecedents of trust, marketing and the internet, creating trust in cyber space, trust issues in cyber space, the private sector role in securing cyberspace - national governments and their role in securing cyberspace - international law's role in securing cyberspace

UNIT 5 CYBER MEDIA, CYBER EDUCATION ETHICS AND CASE STUDIES IN ETHICS

9 Hrs

Cyber Ethics Requires Critical Thinking of Citizens, Cyber Bullying, child protection online: UNICEF India Recommendations, Virtual House Calls: Cyber Home Health Care, The Virtual House Call, Dial-Up Medicine, Cybercare, Avoiding Drug-Drug Interactions, An Interactive Support Group for ALS, Information and Support on the Internet, Fear and Communication.

Max. 45 Hrs.

COURSE OUTCOME

On completion of the course the student will be able to

CO1: Explain the ethics and disability ethics.

CO2: Categorize the various types of cyber laws.

CO3: classify the various cyber security policy

catalog. CO4: summarize the secure and trust of

cyber space. CO5: Interpret the cyber media, cyber

education ethics CO6: Analyse the various case

studies in ethics

TEXT/ REFERENCE BOOK:

1. Cybersecurity Ethics, Legal, Risks, and Policies by Ishaani Priyadarshini, Chase Cotton, 2021, Apple Academic Press.-
2. Gary L. Albrecht, ETHICS, LAW AND POLICY. The SAGE Reference Series on Disability: Key Issues and Future Directions Series.
3. Jonathan Rosenoer, CyberLaw - The Law of the Internet, 1997 Springer-Verlag New York, Inc
4. Ethics and Information Technology: A Case-Based Approach to a Health Care System in Transition James G. Anderson Kenneth W. Goodman SPRINGER
5. Cyber Ethics 4.0: Serving Humanity with Values (Globethics.net Global Series), by Christoph Stückelberger (Author), Pavan Duggal (Author)

END SEMESTER EXAMINATION QUESTION PAPER

PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 10 Questions carrying 2 marks each - No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSA1518	ENTERPRISE BLOCK CHAIN PLATFORMS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To teach the concepts of blockchain technologies
- To cover the technical aspects of Hyperledger.
- To familiarize potential applications of Ripple and Stellar
- To understand the use of Corda and Quorum
- To learn, how these systems work and how to engineer secure software that interacts with the Bit coin network and other crypto currencies.

UNIT 1 INTRODUCTION

9 Hrs.

Basic of Blockchain Architecture - Challenges - Applications - Block chain Design Principles -The Blockchain Ecosystem - The consensus problem - Asynchronous Byzantine Agreement - AAP protocol and its analysis - Nakamoto Consensus on permission-less, nameless, peer-to-peer network - Abstract Models for BLOCKCHAIN - GARAY model - RLA Model

UNIT 2 HYPERLEDGER

9 Hrs.

Hyperledger- Hyperledger framework - Public and Private Ledgers-Hyperledger Fabric-Hyperledger sawtooth-Hyperledger Iroha- Introduction to Decentralized Application Platform- Interplanetary File System- Hashgraph

UNIT 3 RIPPLE AND STELLAR

9Hrs

Ripple-Framework-Consensus Algorithm-Ledger-Case Study. Stellar-Framework-Consensus Protocol-Ledger-Smart Contract-Case Study- Comparison of Ripple and Stellar

Unit 3 CORDA AND QUORUM

9 Hrs.

Corda-Framework-Consensus Algorithm- Asynchronous Byzantine Fault Tolerance-Ledger-Case Study. Quorum- Framework-Consensus Protocol- Ledger-Smart Contract-Case Study.

UNIT 5 TEZOS AND DRAGONCHAIN

9 Hrs.

Tezos-Framework-Consensus Algorithm-Delegated Proof of Stake-Ledger-Case Study. DragonChain-Framework-Consensus Algorithm- Context-Based Verification with five levels of consensus-Ledger-Case Study

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Understand emerging abstract models for Block chain Technology
- CO2: Analyse the concept of Hyperledger
- CO3: Apply the tools for understanding the background of Blockchain Platforms
- CO4: Identify major research challenges and technical gaps existing between various Blockchain Platforms
- CO5: Understanding of latest advances in Block Chain Platform.
- CO6: Identify the appropriate blockchain platform for an application

TEXT /REFERENCE BOOKS

1. Melanie Swan, "Block Chain: Blueprint for a New Economy", O'Reilly, first edition - 2015.
2. Daniel Drescher, "Block Chain Basics", Apress; 1st edition, 2017
3. Imran Bashir, "Mastering Block Chain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained", Packt Publishing, first edition - 2012.
4. Ritesh Modi, "Solidity Programming Essentials: A Beginner's Guide to Build Smart Contracts for Ethereum and Block Chain", Packt Publishing.
5. <https://developer.ibm.com/patterns/create-and-deploy-block-chain-network-usingfabric-sdk-java/>
6. <https://www.leewayhertz.com/blockchain-platforms-for-top-blockchain-companies/>

SCSA2509	NETWORK SECURITY LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- Develop and implement a java interface for encryption and decryption algorithms i.e., DES, MD5 and RSA algorithms.
- To provide deeper understanding into cryptography, its application to network security, threats/vulnerabilities to networks and countermeasures.
- To explain various approaches to Encryption techniques, strengths of Traffic Confidentiality, Message Authentication Codes.
- To get familiarized to binary tree traversal.
- To familiarize symmetric and asymmetric cryptography.

LIST OF EXPERIMENTS

1. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should AND or and XOR each character in this string with 127 and display the result.
3. Write a Java program to perform encryption and decryption using the following algorithms
 - Ceaser cipher
 - Substitution cipher
 - Hill Cipher
4. Write a C/JAVA program to implement the DES algorithm logic.
5. Write a C/JAVA program to implement the Blowfish algorithm logic.
6. Write a C/JAVA program to implement the Rijndael algorithm logic.
7. Write the RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" using Blowfish. Create your own key using Java key tool.
8. Write a Java program to implement RSA algorithm.
9. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
10. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
11. Calculate the message digest of a text using the MD5 algorithm in JAVA.
12. Implementation of Hash Functions

COURSE OUTCOMES

On completion of the course the student will be able to

CO1: Identify basic security attacks and services

CO2: Use symmetric and asymmetric key algorithms for

cryptography CO3: Compare the performance of various security algorithms

CO4: Perform encryption and decryption on any data

given. CO5: Apply the Digital signature for secure data

transmission CO6: Apply the cryptographic algorithms for data communication

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3
Hrs.

CAE: Evaluation of Regular Lab class

15 Marks

Model practical exam

10 Marks

25 Marks

ESE: End Semester Practical Exam

25 Marks

SCSA1613	INTRUSION DETECTION SYSTEM	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES:

- To study the pre crime data mining techniques
- To be familiar with the searchable database
- To learn the clustering concepts using text mining
- To evaluate and analyse the Intrusion detection, techniques and systems
- To learn to map the crime using clustering

UNIT 1 PRE-CRIME DATA MINING

9hrs

Behavioural Profiling, Rivers of Scraps, Data Mining, Investigative Data Warehousing, Link Analysis, Software Agents, Text Mining, Neural Networks, Machine Learning, Precrime, September 11, 2001, Criminal Analysis and Data Mining, Profiling via Pattern Recognition, Calibrating Crime, Clustering Burglars: A Case Study

UNIT 2 INVESTIGATIVE DATA WAREHOUSING

9hrs

Relevant Data, Data Testing, The Data Warehouse, Internet Data, XML, Data Preparation, Interrogating the Data, Data Integration, Security and Privacy, Choice Point: A Case Study, Tools for Data Preparation, Link Analysis: Visualizing Associations, Using Link Analysis Networks, Fighting Wireless Fraud with Link Analysis: A Case Study, Link Analysis Tools

UNIT 3 TEXT MINING: CLUSTERING CONCEPTS

9hrs

Text Mining Definition, Working of Text Mining Work, Text Mining Applications, Searching for Clues in Aviation Crashes: A Case Study, Clustering News Stories: A Case Study, Text Mining for Deception, Text Mining Threats, Text Mining Tools

UNIT 4 INTRUSION DETECTION: TECHNIQUES AND SYSTEMS

9hrs

Cybercrimes, Intrusion MOs, Intrusion Patterns, Anomaly Detection, Misuse Detection, Intrusion Detection Systems, Data Mining for Intrusion Detection: A Case Study from the Mitre Corporation, Types of IDSs, Misuse IDSs, Anomaly IDSs, Multiple-Based IDSs, Data Mining IDSs, Advanced IDSs, Forensic Considerations, Early Warning Systems

UNIT 5 MAPPING CRIME: CLUSTERING CASE WORK

9hrs

Crime Maps, Interactive Crime GIS, Crime Clusters, Modelling the Behaviour of Offenders Who Commit Serious Sexual Assaults: A Case Study, Decomposing Signatures Software, Computer Aided Tracking and Characterization of Homicides and Sexual Assaults (CATCH), Forensic Data Mining, Alien Intelligence, Weka tool: Introduction to WEKA, The Explorer - Getting started, Exploring the explorer.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Study the pre crime data mining techniques
- CO2: Be familiar with the searchable database
- CO3: Learn the clustering concepts using text mining
- CO4: Evaluate and analyse the intrusion detection, techniques and systems
- CO5: Learn to map the crime using clustering
- CO6: Learn the different tools for applying mining concepts.

TEXT REFERENCE BOOKS:

1. Investigative Data Mining for Security and Criminal Detection, Jesús Mena, Butterworth Heinemann, Elsevier Science, 2003
2. Jiawei Han and Micheline Kamber, —Data Mining Concepts and Techniques, Third Edition, Elsevier, 2012.
3. Ian H.Witten and Eibe Frank, —Data Mining: Practical Machine Learning Tools and Techniques, Elsevier, Second Edition.
4. Intrusion detection systems Edited by Pawel Skrobanek Intrusion Detection Systems Edited by Pawel Skrobanek Published

SCSA1614	DEVOPS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand DevOps the advanced process of software engineering for faster problem resolution & team collaboration.
- To understand about Agile methodology as a practice to promote continuous iteration of development and testing throughout SDLC.
- To learn the integration of Cloud with DevOps
- To understand the Configuration Tool
- To Understand the Monitoring Tool

UNIT 1 INTRODUCTION TO DevOps

9 Hrs.

Introduction to DevOps - DevOps vs Agile - DevOps Principles and Life Cycle - Introduction to CI / CD & DevOps Tools-Version Control - Build Automation - Configuration Management- Containerization-- Continuous Deployment - Continuous Integration - Continuous Testing -Continuous Monitoring.

UNIT 2 AGILE SOFTWARE DEVELOPMENT

9 Hrs.

Software Development- using Extreme Programming - Roles & Rules - Software Development using Scrum Framework - Scrum team - Sprints - Sprints planning - Metrics - Scrum tools - Case Studies.

UNIT 3 CLOUD COMPUTING AND AWS

9Hrs

Cloud computing -Characteristics of cloud computing - Cloud implementation models - Cloud service models - Elastic Cloud Computing - Simple Storage Service - Elastic Block Storage - Elastic Load Balancer - Auto Scaling - Identity Access Management -Relational Database Server.

UNIT 4 GIT AND CONFIGURATION MANAGEMENT TOOL

9 Hrs.

GIT Basics-Different Git tools - Git Installation and Configuration - Setting up Git Bash and Git UI -GIT commands -Configuration Management Tool: Overview of Chef-Workstation Setup - Organization Setup- Test Node Setup -Puppet Architecture -Installation and Configuration.

UNIT 5 DEPLOYMENT AND MONITORING TOOL

9 Hrs.

Deployment Tool - Jenkins - Build Cycle - Jenkins Architecture-Installing and configuring Jenkins using WAR and RPM-Securing Jenkins-Dockers vs Virtualization - Docker Architecture - Docker Networking- Monitoring tool - About New Relic - Installing and Configuring New Relic - Application Monitoring using New Relic - Server Monitoring using New Relic - Alerts policies.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Apply DevOps faster problem resolution & team collaboration.
- CO2: Implement Agile software methodology for faster development of quality software
- CO3: Describe how to improve collaboration between Cloud and DevOps.
- CO4: Implement Configuration Management
- CO5: Implement Automated Installations and Deployments
- CO6: Unresolved different transformations of a product or a service through brainstorming and incremental approach, etc.

TEXT /REFERENCE BOOKS

1. KalloriVikram, —Introduction to DevOps, 1 st Edition, KalloriVikram Publication, 2016.
2. Jaokim Verona, —Practical DevOps, 2 nd Edition, Packt. Publication, 2018.
3. Stephen Fleming, Pravin, —DevOps Handbook: Introduction of DevOps Resource Management—,1st Edition, Createspace Independent Pub., 2010.
4. Len Bass, Ingo Weber, Liming Zhu, G., —DevOps: A Software Architect’s Perspective, 1st Edition, Addison-Wesley Professional, 2015.
5. Alistair Cockburn, “Agile Software Development”, 2nd ed, Pearson Education, 2007.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

PART A: 10 Questions carrying 2 marks each - No choice

20 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

80 Marks

SCSA1615	SMART CONTRACT	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand about Ethereum and differentiate with Bitcoin
- To learn about open Blockchain Platform
- To understand smart contracts, Dapps, and DAOs
- To learn about open Blockchain platform's and ICOs
- To create private blockchain, new crypto-currency and Mine for tokens
- To set-up a blockchain development environment and Program using Solidity
- To build a smart contracts Dapps

UNIT 1 INTRODUCTION

9Hrs.

Ethereum, Ethereum Vs Bitcoin, Ethereum Clients, Account Management, Ether, The Ethereum network, Mining, History of Ethereum, Community, The Ethereum Foundation. Smart Contracts, Dapps, And DAOs, Quick Start Overview of Remix using JavaScript VM.

UNIT 2 Ethereum Technology Overview & Current and Potential Uses of Ethereum

9Hrs.

Architectural Overview, Ethereum Blockchain Platform, Ethereum Virtual Machine, Create your private Ethereum blockchain, Download the main Ethereum blockchain, Analyse Ethereum blockchain. Current Ethereum, Applications, Initial Coin Offerings, Payment Systems, Investing in Gold, Crowdfunding, Corporate Finance, The Internet of Things, Casinos, Lotteries, And Online Gambling, Prediction Markets, Web Hosting, Social Networks, Insurance, Entertainment, Real Estate, Energy Transfer, Marriage Contracts and Wills, Decentralized Cryptocurrency Exchange, Supply Chain Management, Financial Markets, Election and Votes.

UNIT 3 Introduction to Programming Smart Contracts & Programming Tutorial - Installing, Building, Testing, & Deploying 9Hrs.

A Simple Smart Contract, Account Types, Gas, and Transactions, Contracts, Accessing Contracts and Transactions, Mix, Dapps, Developer Tools, Ethereum Tests, Web3 Base Layer Services, Ethereum Nodes, Building A Private Blockchain Network, MetaMask Browser Plug In, Mist Browser, Ethereum Wallet, Web3 Ethereum JavaScript API, Remix Web Browser IDE, Geth (Go Ethereum) Command Line Interface.

UNIT 4 Solidity Programming

9Hrs.

Layout of a Solidity Source File, Structure of a Contract, Types, Units and Globally Available Variables Input Parameters and Output Parameters, Control Structures, Function Calls, Creating Contracts via new Order of Evaluation of Expressions, Assignment, Scoping and Declarations, Error handling: Assert, Require, Revert and Exceptions, Creating Contracts, Visibility and Getters, Function Modifiers, Constant State Variables, Functions Events, Inheritance, Abstract Contracts, Interfaces, Libraries.

UNIT 5 Decentralized Apps - Coding Details, Style Guide, Design Patterns

9Hrs.

Decentralized Application Architecture, Connecting to the Blockchain and Smart Contract, Web3js, Deployment Sample Web Pages (HTML/CSS/JavaScript), Voting Contract and App, Blind Auction Contract and App Safe Remote Purchase Contract and App, Micropayment Channel Contract and App, Coding Style Guide Code Layout, Naming Conventions, Common Design Patterns, Withdrawal from Contracts, State Machine.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1- Knowledge on Ethereum and it's significant difference from Bitcoin
- CO2- Technological overview on Ethereum and it's uses
- CO3- Step to set-up for Smart Contract
- CO4- Development of application using Smart Contract
- CO5- Decentralised application study

TEXT /REFERENCE BOOKS

1. Ethereum Homestead Documentation, Ethereum Community, March 01, 2017: <http://www.ethdocs.org/en/latest/index.html>
2. Solidity Documentation, Ethereum Community, May 14, 2021: <https://solidity.readthedocs.io/en/develop/index.html>
3. <http://www.ethdocs.org/en/latest/introduction/what-is-ethereum.html>
4. <https://solidity.readthedocs.io/en/develop/introduction-to-smart-contracts.html>
5. <http://www.ethdocs.org/en/latest/contracts-and-transactions/index.html>
6. <https://solidity.readthedocs.io/en/develop/solidity-in-depth.html>
7. <https://solidity.readthedocs.io/en/develop/solidity-by-example.html>
8. <https://solidity.readthedocs.io/en/develop/style-guide.html>
9. <https://solidity.readthedocs.io/en/develop/common-patterns.html>

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

PART A: 10 Questions carrying 2 marks each - No choice

PART B: 2 Questions from each unit of internal choice, each carrying 16 marks

Exam Duration:3 Hrs.

20 Marks

80 Marks

SCSA2610	INTRUSION DETECTION SYSTEM LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To apply data mining techniques and methods to large data sets.
- Be familiar with the algorithms of data mining
- Be acquainted with the tools and techniques used for Knowledge Discovery in Databases.
- Be exposed to web mining and text mining
- To use network security tools and vulnerability assessment tools
- To compare and contrast the various classifiers

SUGGESTED LIST OF EXPERIMENTS

1. Apriori Algorithm.
2. FP-Growth Algorithm.
3. K-means clustering.
4. One Hierarchical clustering algorithm.
5. Bayesian Classification.
6. Decision Tree.
7. Support Vector Machines.
8. Applications of classification for web mining.
9. Case Study on Text Mining or any commercial application.
10. Demonstrate intrusion detection system (ids) using any tool e.g. Snort or any other s/w.
11. Automated Attack and Penetration Tools, Exploring N-Stalker, a Vulnerability Assessment Tool
12. Demonstrate Intrusion Detection System (IDS) using any tool (snort or equivalent software)
13. Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w).
14. Setup a honey pot and monitor the honeypot on network (KF Sensor)
15. Penetration testing, IDS

COURSE OUTCOMES

On completion of the course the student will be able to

CO1 - Apply data mining techniques and methods to large data sets. CO2: Familiar with the algorithms of data mining
CO3: Acquaint with the tools and techniques used for knowledge discovery in databases. CO4: Expose to web mining and text mining
CO5: Use network security tools and vulnerability assessment tools CO6: Compare and contrast the various classifiers

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3
Hrs.

CAE: Evaluation of Regular Lab class
Model practical exam

15 Marks
10 Marks

25 Marks

SCSA2611	DEVOPS LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To learn the software configuration management in DevOps
- To Perform Version Control on Websites
- To Install and Configure Docker for Creating Containers
- To Build Web Application on Docker.
- To Perform Configuration Management using Chef/Puppet.

LIST OF EXPERIMENTS

1. Version Control to Perform Version Control on websites/ Software using different Version control tools like RCS/ CVS/GIT/Mercurial.
2. Virtualization & Containerization to Install and Configure Docker for creating Containers of different Operating System Images 04 LO 1 LO 4.
3. Virtualization & Containerization to Build, deploy and manage web or Java application on Docker
4. Provisioning to Perform Software Configuration Management and provisioning using Chef/Puppet/Ansible or Saltstack.

COURSE OUTCOMES

On completion of the course the student will be able to

- CO1: Remember the importance of DevOps tools used in software development life cycle
 CO2: Understand the importance of Jenkins to Build, Deploy and Test Software Applications
 CO3: Examine the different Version Control strategies
 CO4: Analyse & Illustrate the Containerization of OS images and deployment of applications over Docker
 CO5: Summarize the importance of Software Configuration Management in DevOps
 CO6: Synthesize the provisioning using Chef/Puppet/Ansible or Saltstack.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

CAE: Evaluation of Regular Lab class

15 Marks

Model practical exam

10 Marks

25 Marks

ESE: End Semester Practical Exam

25 Marks

SCSB1261	INTRODUCTION TO BLOCKCHAIN TECHNOLOGY	L	T	P	E	Credits	Total Marks
		3	0	0	0		

COURSE OBJECTIVE

- To understand the history, types and applications of Blockchain
- To acquire knowledge about cryptography and consensus algorithms.
- Deploy projects using Web3j and design blockchain based applications.

UNIT 1 INTRODUCTION TO BLOCKCHAIN 9 Hrs.

Distributed DBMS – Limitations of Distributed DBMS, Introduction to Block chain – History, Definition, Distributed Ledger, Blockchain Categories – Public, Private, Consortium, Blockchain Network and Nodes, Peer-to-Peer Network, Mining Mechanism, Generic elements of Blockchain, Features and Types of Blockchain.

UNIT 2 BLOCKCHAIN ARCHITECTURE 9 Hrs.

Operation of Bitcoin Blockchain, Blockchain Architecture – Block, Hash, Distributer P2P, Structure of Blockchain- Consensus mechanism: Proof of Work (PoW), Proof of Stake (PoS), Byzantine Fault Tolerance (BFT), Proof of Authority (PoA) and Proof of Elapsed Time (PoET).

UNIT 3 BLOCKCHAIN-BASED FUTURES SYSTEM 9 Hrs.

Project presentation- Futures smart contract: Blockchain oracles- Web3j: Setting up the Web3J- Installing web3j- Wallet creation, Java client: The wrapper generator- Initializing web3j- Setting up Ethereum accounts- Deploying the contract.

UNIT 4 BLOCKCHAINS IN BUSINESS AND CREATING ICO 9 Hrs.

Public versus private and permissioned versus permission less blockchains- Privacy and anonymity in Ethereum- Why are privacy and anonymity important? - The Ethereum Enterprise Alliance- Blockchain-as-a-Service- Initial Coin Offering (ICO): Project setup for ICO implementation- Token contracts- Token sale contracts-Contract security and testing the code.

UNIT 5 DISTRIBUTED STORAGE IPFS AND SWARM 9 Hrs.

Ethereum Virtual Machine- Swarm and IPFS: Installing IPFS, Hosting our frontend: Serving your frontend using IPFS, Serving your frontend using Swarm, IPFS file uploader project: Project setup the web page.

Max. 45 Hrs.

COURSE OUTCOME

On completion of the course, student will be able to

- CO1** - Contentedly discuss and describe the history, types and applications of Blockchain.
- CO2** - Gains familiarity with cryptography and Consensus algorithms.
- CO3** - Create and deploy projects using Web3j.
- CO4** - Implement an ICO on Ethereum.
- CO5** - Design block chain based application with Swarm and IPFS.
- CO6** - Create and deploy projects using distributed storage.

TEXT / REFERENCE BOOKS

1. Imran Bashir, “Mastering Blockchain: Distributed Ledger Technology, decentralization, and smart contracts explained”, 2nd Edition, Packt Publishing Ltd, March 2018.
2. Bellaj Badr, Richard Horrocks, Xun (Brian) Wu, “Blockchain By Example: A developer's guide to creating decentralized applications using Bitcoin, Ethereum, and Hyperledger”, Packt Publishing Limited, 2018.
3. Andreas M. Antonopoulos , “Mastering Bitcoin: Unlocking Digital Cryptocurrencies”, O’Reilly Media Inc, 2015.
4. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction”, Princeton University Press, 2016.

E BOOKS

1. <https://www.velmie.com/practical-blockchain-study>.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks : 100 Exam Duration : 3 Hrs.

PART A : 10 Questions of 2 marks each-No choice 20 Marks
from each unit with internal choice, each carrying 16 marks 80 Marks