Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VIII**
Subject: **Big Data Analytics** Course Code: **D033811(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course Objectives:

- To Understand the Big Data Platform and its Use cases
- To Understand the application of Statistical Methods
- To Provide Concepts of Advanced Analytical Theory and Methods
- To Apply Analytical Theory, Methods and Frameworks

UNIT–I: Introduction to Big Data: Big Data – Definition, Characteristic Features – Big Data Applications, Challenges of Conventional Systems– Challenges in Big Data Analytics, Big Data vs Traditional Data, Risks of Big Data, Structure of Big Data – Evolution of Big data – Evolution of Analytic Scalability, Evolution of Analytic Processes, Typical Analytical Architecture – Requirement for new analytical architecture– Need of big data frameworks, Tools and methods , Analysis vs Reporting, Modern Data Analytic Tools.

UNIT–II: Data Analysis: Statistical Methods: Sampling Distributions, Re, Sampling, Statistical Inference, Regression modelling, Multivariate Analysis, Classification: Decision Trees – Overview of a Decision Tree – The General Algorithm, Decision Tree Algorithms, Evaluating a Decision Tree, Decision Trees in R, Naïve Bayes, Bayes 'Theorem, Naïve Bayes Classifier. Overview of Clustering, Cluster Analysis, Types of Data in Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods, Clustering High Dimensional Data, Predictive Analytics, Data analysis using R.

UNIT–III: Advanced Analytical Theory and Methods: Association Rules, Overview, Apriori Algorithm, Evaluation of Candidate Rules, Applications of Association Rules, Finding Association & finding similarity, Recommendation System: Collaborative Recommendation, Content Based Recommendation, Knowledge Based Recommendation, Hybrid Recommendation Approaches.

UNIT–IV: Mining Data Streams: Introduction to Streams Concepts, Stream Data Model and Architecture, Stream Computing, Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Estimating moments, Counting oneness in a Window, Decaying Window, Real time Analytics Platform (RTAP) applications, Case Studies, Real Time Sentiment Analysis, Stock Market Predictions. Using Graph Analytics for Big Data: Graph Analytics.

UNIT–V: Frameworks: Introduction to NoSQL, Aggregate Data Models, Hbase: Data Model and Implementations, Applications on Big Data Using Pig and Hive, Data processing operators in Pig, Hive services, HiveQL, Querying Data in Hive, fundamentals of HBase and Zoo Keeper, Introduction to Hadoop. Visualizations, Visual data analysis techniques, interaction techniques, Big Data Use Cases, Applications.

Text Books:

1. Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools,Techniques, NoSQL, and Graph, David Loshin, 2013.

2. Mining of Massive Datasets, Anand Rajaraman and Jeffrey David Ullman,Cambridge University Press, 2012.

References:

1. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj kamal, Preeti Saxena, McGraw Hill, 2018.
2. Taming the Big Data Tidal Wave: Finding OpportUNITies in Huge Data Streams with Advanced Analytics‖, Bill Franks, Wiley and SAS Business Series, 2012.
3. Hadoop: The Definitive Guide, Tom White, Third Edition, O'reilly Media, 2012.
4. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Michael Minelli, Michelle Chambers, and Ambiga Dhiraj, Wiley, 2013.
5. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, P.
6. J. Sadalage and M. Fowler, Addison-Wesley Professional, 2012.
7. Learning R, A Step-by-step Function Guide to Data Analysis, Richard Cotton, O'Reilly Media, 2013.

Course Outcomes:

At the end of this course, the students will be able to:

- Explore the fundamental concepts and competitive advantages of big data analytics
- Analyze the big data by utilizing various statistical and data mining approaches.
- Understand various data analysis methods and intelligent techniques.
- Perform analytics on real-time streaming data.
- Understand various No SQL database models and visualization techniques.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VIII**

Subject: **Hadoop (Lab)** Course Code: **D033821(033)**

Total Lab Periods: **36** Batch size: **30**

Max Marks: **40** Min Marks: **20**

Course Objectives:

- Introduce the tools required to manage and analyze big data like Hadoop, NoSQL
- Understand Map Reduce Paradigm.
- Identify various sources of Big data
- Enable students to have skills that will help them to solve complex real-world problems.
- Practice programming tools PIG and HIVE in Hadoop eco system.

List of experiments: -

1. Study of Hadoop ecosystem
2. Basic HDFS commands
3. Hadoop File System navigation and manipulation using commands
4. Implement the following file management tasks in Hadoop:
   i. Adding files and Directories ii. Retrieving files iii. Deleting files
5. Implementing simple algorithms in Map- Reduce (3) - Matrix multiplication, Aggregates, joins, sorting, searching etc.
6. Hadoop Programming: Word Count Map Reduce Program
7. Hive shell Writing Basic Hive queries ii) Hive DDL and DML.
8. Using Hive to perform CRUD Operations-Databases, Tables, Views, Functions and
9. Indexes.
10. Use Hive to create, alter, and drop databases, tables, views, functions, and indexes.
11. Practicing pig commands from grunt shell.
12. Writing pig scripts and running them.
13. Processing different datasets using pig.

Reference Books:

1. Alex Holmes “Hadoop in Practice”, Manning Press, Dreamtech Press.
2. Jay Liebowitz, ―Big Data And Business Analytics Laboratory, CRC Press.

Course Outcome: At the completion of the course a student will be able to –

- Demonstrate capability to use Big Data Frameworks like Hadoop
- Implement the file management tasks in Hadoop.
- Program applications using tools like Hive, Pig, NO SQL and MongoDB for Big data Applications
- Construct scalable algorithms for large Datasets using Map Reduce techniques

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VIII**

Subject: **Simulation (Lab)** Course Code: **D033822(033)**

Total Lab Periods: **36** Batch size: **30**

Max Marks: **40** Min Marks: **20**

Course Objective:

- To understand and develop at least small MATLAB programs and Simulink models.
- To motivate our students to design and simulate small system.
- To develop better understanding of new MATLAB based IT tools for their projects.

List of experiments: -

1. Basics of MATLAB programming. (Can develop at least small programs)
2. Basics of Simulink modeling and simulation.
3. Simulink based system design.
4. Identify and explore different IT tools in MATLAB.
5. Explore ANN and AI tools.
6. Explore machine learning and deep learning tools.
7. Thing Speak web service apps to analyze and visualize the data in MATLAB.
8. Arduino with MATLAB and Simulink.
9. IoT based system design using MATLAB.
10. MATLAB based communication tools.

Reference Books:

1. MATLAB for Beginners: A Gentle Approach, Revised Edition, Peter I. Kattan, Petra Books.
2. Modeling and Simulation of Systems using MATLAB and Simulink, Devendra K. Chaturvedi, CRC Publication.
3. Arduino meets MATLAB: Interfacing, Programs and Simulink, Rajesh Singh, Anita Gehlot, Bhupendra Singh, Sushabhan Choudhury, Bentham e Books.
4. IoT System Design Project Based Approach, Alice James • Avishkar Seth • Subhas Chandra Mukhopadhyay, Springer.
5. Arduino Programming using MATLAB, Agus Kurniawan, 1st Edition, 2015.

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

- Use the MATLAB based IT tools for the analysis of data and systems.
- Design different automated systems as a project of their choice using these IT tools.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VII**
Subject: **Project (Phase–II)** Course Code: **D033823(033)**
Total Lab Periods: **36** Batch size: **30**
Max Marks: **40** Min Marks: **20**

Course Objectives:

- To provide an opportunity for students to learn from professionals of the industry.
- To provide an opportunity for students to understand real-life practices and implementation of theoretical Engineering knowledge in practical environment.
- To provide an opportunity for students to acquire interpersonal skills and ability for team work.
- To obtain knowledge of how to make optimal decisions to resolve technical challenges.

Major Project of Final Year B.Tech. students is divided into 2 phases: -

- Phase – 1 in 7th Sem
- Phase – 2 in 8th Sem

Project Phase - II:

The objective of Project Work Phase II & Dissertation is to enable the student to extend further the investigative study taken up in Project Phase I, either fully practical or involving both theoretical and practical work, under the mentoring of Project Guide(s) from the Department.

The assignment shall normally include:

- In depth study of the topic assigned in the light of the Report prepared in Phase I;
- Review and finalization of the Approach to the Problem relating to the assigned topic;
- Detailed Analysis/Modeling/Simulation/Design/Problem Solving/Experiment as needed;
- Final development of product/process, testing, results, conclusions and future directions;
- Preparing a paper for Conference presentation/Publication in Journals;
- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before the concerned evaluation committee.

Course Outcomes: On completion of the course, students will –

- Be able to apply engineering knowledge and utilize technical resources in real life projects by integrating classroom theory with real-time situations.
- Acquire practical skills, organizational skills, Communication skills, professional awareness and experience working on projects.
- Obtain knowledge of how to make optimal decisions to resolve technical challenges.
- Be able to write technical documents and give oral presentations related to the project work completed

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VII**
Subject: **Introduction to Data Science (Professional Elective-IV)** Course Code: **D033831(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Max Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course objectives:

- Incorporate data science principles to address data-dependent questions in the humanities, social sciences, and sciences.
- Apply basic exploratory analysis to identify abnormalities in data (i.e., missing values, outliers, redundant features, etc.)
- Anticipate and identify ways in which sampled data may be biased
- Prepare data sufficient for answering a range of research questions across liberal arts disciplines

UNIT–I: Introduction: Introduction to Data Science , Evolution of Data Science , Data Science Roles, Stages in a Data Science Project , Applications of Data Science in various fields , Data Security Issues.

UNIT–II: Data Collection and Data Pre-Processing: Data Collection Strategies, Data Pre- Processing Overview, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization.

UNIT–III: Exploratory Data Analytics: Descriptive Statistics, Mean, Standard Deviation, Skewness and Kurtosis, Box Plots, Pivot Table, Heat Map, Correlation Statistics, ANOVA.

UNIT–IV: Model Development: Simple and Multiple Regression, Model Evaluation using Visualization, Residual Plot, Distribution Plot, Polynomial Regression and Pipelines, Measures for In-sample Evaluation, Prediction and Decision Making.

UNIT–V: Model Evaluation: Generalization Error, Out-of-Sample Evaluation Metrics, Cross Validation, Overfitting, Under Fitting and Model Selection, Prediction by using Ridge Regression, Testing Multiple Parameters by using Grid Search.

Text Book:

1. Cathy O'Neil and Rachel Schutt, "Doing Data Science", O'Reilly, 2015.

Reference Books:

1. Jojo Moolayil, "Smarter Decisions: The Intersection of IoT and Data Science", PACKT, 2016.
2. David Dietrich, Barry Heller, Beibei Yang, "Data Science and Big data Analytics", EMC 2013
3. Raj, Pethuru, "Handbook of Research on Cloud Infrastructures for Big Data Analytics", IGI Global.

Course Outcomes: Upon course completion, a student will be able to:

- Identify and describe the methods and techniques commonly used in data science.
- Demonstrate proficiency with the methods and techniques for obtaining, organizing, exploring, and analyzing data.
- Recognize how data analysis, inferential statistics, modeling, machine learning, and statistical computing can be utilized in an integrated capacity.
- Create and modify customizable tools for data analysis and visualization per the evaluation of characteristics of the data and the nature of the analysis.
- Demonstrate the ability to clean and prepare data for analysis and assemble data from a variety of sources.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VII**
Subject **Digital Image Processing (Professional Elective-IV)** Course Code: **D033832(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Max Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course Objectives:

- To understand the basics of the human visual system as they relate to image processing including spatial frequency resolution and brightness adaptation.
- To teach the students about variousimage enhancement techniques and transformation of images.
- To have an illustrative idea about various edge detection techniques and the need of thresholding and types of thresholding techniques.
- To have a brief idea about approaches to restoration and image compressions.

UNIT–I: Introduction to Image Processing: Applications and Fields of Image Processing, Fundamental stepsin Digital Image Processing, Elements of Visual Perception, Image Sensing and Acquisition, Basic Concepts in Sampling and Quantization, Representing DigitalImages.

UNIT–II: Image Enhancement in the Spatial Domain: Some basic gray level Transformations, Histogram Processing, Histogram Modification, Image Subtraction, Spatial Filtering, Sharpening Spatial Filters, Use of First and Second Derivatives for Enhancement, Image Enhancement in the Frequency Domain, Gaussian Filters, Homomorphic Filtering, Pseudo colouring: Intensity Slicing, Gray level to Color Transformation.

UNIT–III: Image Segmentation: Some Basic Relationships between Pixels, Point, Line and Edge Detection, Gradient Operators, Canny Edge Detection, Pyramid Edge Detection, Edge Linking and Boundary Detection, Hough Transform, Chain Codes, Boundary Segments, Skeletons, Boundary Descriptors, Fourier Descriptors.

UNIT–IV: Thresholding: The Role of Illumination, Global Thresholding, Adaptive Thresholding, Use of Boundary Characteristics for Histogram Improvement and Local Thresholding, Region based Segmentation, Region Growing, Region Splitting and Merging.

UNIT–V: Image Restoration: Degradation Model, Restoration in Spatial Domain, Geometric Transformation, Spatial Transformation, Approach to Restoration, Inverse & Wiener Filtering, Image Compression: Basics of Image Compression. Text Books: 1. Digital Image Processing by Gonzalez & Woods, Pearson Education. 2. Introduction to Digital Image Processing by Alasdair Mc Andrew, Cengage learning. 3. Fundamental of Digital Image Processing by A K Jain, PHI.

Text Book:

1. Digital Image Processing by Madhuri A. Joshi, PHI

Reference Books:

1. Image Processing, Analysis and Machine Vision by Milan Sonka, Thomson Learning.
2. Digital Image Processing by Pratt W.K, John Wiley & Sons.

Course Outcomes:

- Students will understand how images are represented; understand image types such as binary images, gray-scale images, color and multi-spectral images.
- Emphasis will be to develop engineering skills and intuitive understanding of the tools used in Image Processing.
- Students will be able to do various operations on images like Image enhancement, transformation, sharpening etc.
- Students can analyze various edge detection techniques and their algorithms.
- Students will be able to use various thresholding techniques and segmentations. 6. Students will be able to visualize approaches used in image restoration.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VIII**
Subject**: Block Chain Technology and Applications** Course Code: **D033833(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Max Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course Objectives:

- By the end of the course, students will be able to
- Understand how blockchain systems (mainly Bitcoin and Ethereum) work,
- To securely interact with them,
- Design, build, and deploy smart contracts and distributed applications,
- Integrate ideas from blockchain technology into their own projects.

UNIT-I: Introduction of Cryptography and Block chain: What is Blockch Mechanisms & Networks, Blockchain Origins, Objective of Block chain, Block chain Challenges, Transactions and Blocks, P2P Systems, Keys as Identity, Digital Signatures, Hashing, and public key cryptosystems, private vs. public Block chain.

UNIT-II: Bitcoin and Cryptocurrency: What is Bitcoin, The Bitcoin Network, The Bitcoin Mining Process, Mining Developments, Bitcoin Wallets, Decentralization and Hard Forks, Ethereum Virtual Machine (EVM), Merkle Tree, Double-Spend Problem, Block chain and Digital Currency, Transactional Blocks, Impact of Block Chain Technology On Cryptocurrency.

UNIT-III: Introduction to Ethereum: What is Ethereum, Introduction to Ethereum, Consensus Mechanisms, How Smart Contracts Work, Meta mask Setup, Ethereum Accounts,Receiving Ether's What's a Transaction? Smart Contracts.

UNIT-IV: Introduction to Hyper ledger: What is Hyper ledger? Distributed Ledger Technology & its Challenges, hyper ledger & Distributed Ledger Technology, Hyper ledger Fabric, Hyper ledger Composer.

UNIT-V: Solidity Programming: Solidity - Language of Smart Contracts, Installing Solidity &Ethereum Wallet, Basics of Solidity, Layout of a Solidity Source, File & Structure of SmartContracts, General Value Types (Int, Real, String, Bytes, Arrays, Mapping, Enum, address) Block chain Applications: Internet of Things, Medical Record Management System, Domain Name Service and Future of Block chain, Alt Coins

Text Books:

1. Imran Bashir, "Mastering Blockchain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained", Second Edition, Packt Publishing, 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.

Reference Books:

1. Andreas M. Antonopoulos , "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media Inc, 2015 Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder,
2. "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, 2016.

Course Outcomes:

- Understand the fundamentals of Block chain Systems
- Apply bitcoin mining process
- Understand working Ethereum Virtual Machine
- Use Hyper ledger for block chain systems
- Understand Solidity Programming and applications

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VII**
Subject**: Deep Learning Fundamentals** Course Code: **D033834(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Max Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course Objectives:

- Introduce the student to the latest algorithms which have made everything from Self driving cars to Google's Alpha Go possible.
- Deep Learning is at the core of modern-day Artificial Intelligence and Machine Learning applications.
- Student will be introduced to the theoretical background required to fully understand the ongoing research in the field.

UNIT-I: Feed forward Deep Networks: Review of Machine Learning Basics, Vanilla MLP, Estimating conditional Statistics, Flow Graphs and Back propagation, Universal Approximation Properties and Depth, Feature representation, Piecewise Linear Hidden UNITs.

UNIT-II: Regularization of Deep Models: Regularization from Bayesian Perspective, Parameter Norm Penalty, Regularization as Constrained Optimization, Under-Constrained Problems, Classical Regularization as Noise Robustness, Dropout, Multi-Task training, Adversarial Training.

UNIT-III: Optimization for Training Deep Models: Optimization for Model Training, Challenges in Optimization, Basic Algorithms, Adaptive learning rates, Second order methods, Natural gradient methods, Global Optimization.

UNIT-IV: Convolutional Networks: The Convolution Operation, Pooling, Convolution Modules, Efficient Convolution Algorithms, Random or Unsupervised features, Applications in Computer Vision

UNIT-V: Recurrent and Recursive Nets: Unfolding Flow graphs and parameter sharing, Recurrent Neural Networks, Bidirectional RNNs, Deep Recurrent Architecture, Auto- Regressive Networks.

Text Book:

1. Deep Learning, Ian Good fellow, Yoshua Bengio and Aaron Courville.

Reference Books:

1. Artificial Intelligence for Humans: Deep Learning and Neural Networks, Book 3, Jeff Heaton.
2. Deep Learning with Tensor Flow, Giancarlo Zaccone.

Course Outcomes:

1. Upon completion of this course, the students will be able to:
2. Understand machine learning basics and back propagation model.
3. Regularize the deep models.
4. Apply optimization techniques for training deep models.
5. Apply convolution networks for computer vision problems.
6. Use Deep Recurrent Architecture.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Branch: **Information Technology** Semester: **VIII**
Subject: **Cyber Security** Code: **D033835(033)**
Total Theory Periods: **40** Total Tutorial Periods: **10**
No. of class tests to be conducted: **02 (Min)** Max Marks in ESE: **100**
No. of Assignments to be submitted: **One per unit** Min Marks in ESE: **35**

Course Objectives:

- Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- Practice with an expertise in academics to design and implement security solutions.
- Understand key terms and concepts in Cryptography, Governance and Compliance.
- Develop cyber security strategies and policies.
- Understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

UNIT–1: Cyber Security Fundamentals: Cyber security: Introduction, Cyber security objectives, Cyber security roles, Cyber security Common attack types and vectors. Cyber Crimes and Criminals: Definition of cyber-crime, Types of Cyber Crime, Classification of Cyber Criminals, Tools used in Cyber Crime: Challenges, Strategies.

UNIT–2: Cyber attacker Techniques and Motivations: Anti-forensics: Use of proxies, useof tunneling techniques. Fraud techniques: Phishing and malicious mobile code, Rogue antivirus, Click fraud. Threat Infrastructure: Botnets, Fast Flux and advanced fast flux.

UNIT–3: Web Application Vulnerabilities: Understanding vulnerabilities in traditional client server application and web applications, cookie-based attacks, SQL injection, cross domain attack. SSL vulnerabilities and testing Cross-site request forgery, Social Engineering, War Xing, Brute force and dictionary attacks, DNS Amplification Attacks.

UNIT–4: Information Technology Act 2000: Introduction – Need for Cyber Law - Evolution of the IT Act, Genesis and Necessity, Salient features of the IT Act, 2000, various authorities under IT Act and their powers, Penalties & Offences, Amendments and Limitations of IT Act., Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offenses,

UNIT–5: Cyber Law and Related Legislation: Intellectual Property Rights: Patent Law, Trademark Law, Copyright, Copyright in the Digital Medium, Copyright in Computer Programmes, Software Copyright, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Law Relating to Employees and Internet, Alternative Dispute Resolution, Online Dispute Resolution (ODR).

Text Books:

1. Dejey, Dr.Murugan, “Cyber Forensics”, Oxford University Press, India, 2018.
2. Cyber Security Essentials, James Graham et al. CRC Press
3. Cyber Laws: Intellectual property & E Commerce Security, Kumar K. Dominant Publisher

Reference Books:

1. Harish Chander, Cyber Law and IT Protection, PHI Publication, 2012.
2. Philips, Computer Forensics and Investigations, Cengage Learning India Edition.
3. William Stallings and Lawrie Brown, "Computer Security: Principles and Practice", Prentice Hall.
4. John W. Rittinghouse, William M. Hancock, "Cyber Security Operations Handbook", ElsevierPub.
5. Deborah G Johnson, "Computer Ethics", 4th Edition, Pearson Education Publication.
4. Earnest A. Kallman, J.P Grillo, "Ethical Decision making and IT: An Introduction with Cases", McGraw Hill Publication.

Course Outcomes:

- To create cyber security awareness and understand principles of web security.
- To understand the fundamentals of computer forensics, Evidence Collection Etc.
- To understand key terms and concepts in cyber law, intellectual property and cybercrimes, trademarks and domain theft.
- To make attentive to students about possible hacking and threats in this communication era.
- Discuss Issues for creating Security Policy for a Large Organization.

Chhattisgarh Swami Vivekanand Technical University (CSVTU, NEWAI (C.G.))

SCHEME OF TEACHING AND EXAMINATION

B Tech (Eighth Semester – Information Technology)

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Period per Week			Scheme of Examination			Total Mark	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Information Technology	Big Data Analytics	D033811(033)	3	1	-	100	20	30	150	4
2.	**Professional Elective–IV *(Refer to Table-I)***			2	1	-	100	20	30	150	3
3.	**Open Elective–III *(Refer to Table-III)***			2	0	-	100	20	30	150	2
4.	Information Technology	Hadoop (Lab)	D033821(033)	-	-	2	40	-	20	60	1
5.	Information Technology	Simulation (Lab)	D033822(033)	-	-	2	40	-	20	60	1
6.	Information Technology	Project (Phase-II)	D033823(033)	-	-	14	350	-	80	430	7
Total Marks				**7**	**2**	**18**	**730**	**60**	**210**	**1000**	**18**

L – Lecturer, T – Tutorial, P – Practical, CT –Class Test, ESE – End Semester Exam, TA – Teacher's Assessment

Table-I (Professional Elective-IV)

S.N.	Board of Studies	Course Code	Subject
1.	Information Technology	D033831(033)	Introduction to Data Science
2.	Information Technology	D033832(033)	Digital Image Processing
3.	Information Technology	D033833(033)	Blockchain Technology and Applications
4.	Information Technology	D033834(033)	Deep Learning Fundamentals
5.	Information Technology	D033835(033)	Cyber Security

Note: (1) 1/4th of total strength of students subject to minimum of 20 students is required to offer and elective in the college in a particular academic session.

(2) Choice of elective course once made for an examination cannot be changed in future Examinations.