L-2 T-1 P-0 C-3

### CSE991 TR1: Big Data Analytics and Business Intelligence

**Course Objectives:**
- To Understand the fundamentals of data analytics, including key concepts like data visualization, correlation, regression, forecasting, classification, and clustering.
- To Gain knowledge of the Big Data technology landscape, covering Big Data types, architecture, technology components, and programming models.
- To Explore the principles of Business Intelligence, including BI roles, frameworks, project lifecycle, and its comparison with business analytics.
- To Learn Big Data analytics frameworks, tools like Hadoop and MapReduce, ETL processes, text analytics, predictive analysis, and the role of a data analyst.
- To Apply Big Data concepts to real-world scenarios, focusing on workflows, databases, real-time data streams, and cloud-based solutions, while addressing security, governance, and computational challenges

**Course Outcomes (COs)** Upon completion of this unit students will be able to**:**
1. Understand the concept of data analytics and its importance in various industries. Identify the types of data and the relations between them
2. Analyze the various big data technologies and their applications in real-world scenarios and the components of big data technology landscape and its architecture
3. Analyze the business intelligence tools, framework and its components with BI roles and responsibilities
4. Understand the text analytics and predictive analysis on big data
5. Apply the big data and business analytics on new business implementation by consider current business scenario

**Articulation Matrix**
*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

| CO/PO/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 2 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| CO2 | 1 | - | 2 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | - |
| CO3 | 2 | 1 | 2 | 1 | 2 | | | - | - | - | | | 1 | - | 1 |
| CO4 | 2 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | 1 | - |
| CO5 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | - | - | - | 1 | 2 | 2 | - | 2 |

High-3 Medium-2 Low-1

### UNIT-I: Introduction to Data Analytics                                                        9 Hours

Introduction to Data Analytics: Data and Relations, Data Visualization, Correlation, Regression, Forecasting, Classification, Clustering.

### UNIT-II: Big Data Technology Landscape                                                        9 Hours

Big Data Technology Landscape: Fundamentals of Big Data Types, Big data Technology Components, Big Data Architecture, Big Data Warehouses, Functional vs. Procedural Programming Models for Big Data.

### UNIT-III: Introduction to Business Intelligence                                                9 Hours

Introduction to Business Intelligence: Business View of IT Applications, Digital Data, OLTP vs. OLAP, BI Concepts, BI Roles and Responsibilities, BI Framework and components, BI Project Life Cycle, Business

Intelligence vs. Business Analytics.

## UNIT-IV: Big Data Analytics                                                9 Hours

Big Data Analytics: Big Data Analytics, Framework for Big Data Analysis, Approaches for Analysis of Big Data, ETL in Big Data, Introduction to Hadoop Ecosystem, HDFS, Map-Reduce Programming, Understanding Text Analytics and Big Data, Predictive analysis on Big Data, Role of Data analyst.

## UNIT-V: Business implementation of Big Data                               9 Hours

Business implementation of Big Data: Big Data Implementation, Big Data workflow, Operational Databases, Graph Databases in a Big Data Environment, Real-Time Data Streams and Complex Event Processing, Applying Big Data in a business scenario, Security and Governance for Big Data, Big Data on Cloud, Best practices in Big Data implementation, Latest trends in Big Data, Latest trends in Big Data, Big Data Computation, More on Big Data Storage, Big Data Computational Limitations

**Total: 45 Hours**

### Refrence(s)

1. "Big Data: Concepts, Methodologies, Tools, and Applications", by Rajendra Akerkar, Wiley, 1st Edition, 2013.
2. "Data Analytics: Models and Algorithms", by Rajendra Akerkar, Springer, 1st Edition, 2015.
3. "Business Intelligence: A Managerial Perspective", by S. Parthasarathy and S. K. Gupta, PHI Learning, 1st Edition, 2016.
4. "Big Data Analytics: A Hands-On Approach", by S. Srinivasan, Wiley, 1st Edition, 2017.
5. "Data Mining: Concepts and Techniques", by S. K. Gupta and P. K. Sinha, PHI Learning, 1st Edition, 2014.

### List of e-Learning Resources:

1. Introduction to Data Science with Python (DataCamp)https://www.datacamp.com/courses/intro-to-python-for-data-science
2. Deep Learning Specialization (Coursera - Andrew Ng, Deeplearning.ai)https://www.coursera.org/specializations/deep-learning
3. Big Data Analysis with Spark (edX - UC Berkeley)https://www.edx.org/course/big-data-analysis-with-spark

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**Subject Tr.        Academic Coordinator          HoD        Sr. Faculty Nominated by DOAA**
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L-0 T-0 P-2 C-1

### CSE991 PR1: Big Data Analytics and Business Intelligence

**Course Objectives:**

- To Understand the fundamentals of data analytics, including key concepts like data visualization, correlation, regression, forecasting, classification, and clustering.
- To Gain knowledge of the Big Data technology landscape, covering Big Data types, architecture, technology components, and programming models.
- To Explore the principles of Business Intelligence, including BI roles, frameworks, project lifecycle, and its comparison with business analytics.
- To Learn Big Data analytics frameworks, tools like Hadoop and MapReduce, ETL processes, text analytics, predictive analysis, and the role of a data analyst.
- To Apply Big Data concepts to real-world scenarios, focusing on workflows, databases, real-time data streams, and cloud-based solutions, while addressing security, governance, and computational challenges.

**Course Outcomes (COs)** Upon completion of this unit students will be able to**:**
1. Understand the concept of data analytics and its importance in various industries. Identify the types of data and the relations between them.
2. Analyze the various big data technologies and their applications in real-world scenarios and the components of big data technology landscape and its architecture.
3. Analyze the business intelligence tools, framework and its components with BI roles and responsibilities.
4. Understand the text analytics and predictive analysis on big data.
5. Apply the big data and business analytics on new business implementation by consider current business scenario.

**Articulation Matrix**
*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

| CO/PO/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| CO2 | 2 | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | 1 | - | - |
| CO3 | 2 | 2 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | - | 1 |
| CO4 | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 1 | - | - |
| CO5 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | - | - | - | 1 | 2 | 2 | - | 2 |

High-3 Medium-2 Low-1

**Practical's**

1. Identify, compare, and contrast the components of Big Data technologies, including Apache Spark, Hadoop, and NoSQL databases, by evaluating their use cases and advantages.
2. Investigate and critically assess the differences between Business Analytics and Business Intelligence, focusing on their applications in real-world scenarios.
3. Implement predictive analytics techniques on Big Data to solve problems in sectors such as healthcare (e.g., disease prediction) or finance (e.g., fraud detection), and evaluate the outcomes.
4. Design and build an interactive dashboard using tools like Tableau, Power BI, or Python libraries to visualize datasets such as sales data or stock prices.

5. Develop and test a linear regression model on a real-world dataset (e.g., predicting house prices) using scikit-learn in Python, and interpret the results.
6. Perform K-means clustering on a dataset (e.g., customer segmentation) and visualize the clusters using Python, analyzing the results to draw meaningful insights.
7. Build a decision tree for classification (e.g., predicting customer churn) and assess its performance using metrics like accuracy, precision, recall, and F1-score.
8. Utilize a time series dataset (e.g., weather data or stock prices) to design and implement an ARIMA model for predicting future trends, interpreting its accuracy and limitations.
9. Set up and experiment with Hadoop HDFS and MapReduce for processing large datasets, writing and testing basic MapReduce jobs in Java.
10. Design and implement an ETL pipeline using Apache Spark or Python (Pandas) to extract, transform, and load data, analyzing its efficiency for handling Big Data workflows.
11. Apply text analytics techniques, such as tokenization, sentiment analysis, and word clouds, on a text dataset (e.g., social media posts or reviews) to extract actionable insights.
12. Explore and evaluate the functionality of Hive or Pig by querying large datasets in the Hadoop ecosystem and comparing the results with traditional SQL queries.
13. Design and implement a real-time data streaming solution using Apache Kafka or Spark Streaming, analyzing its performance for basic analytics.
14. Study and critically analyze the Business Intelligence lifecycle by examining a case study (e.g., retail industry) and evaluating the roles, responsibilities, and effectiveness of the BI framework.
15. Investigate the components of Hadoop (HDFS, MapReduce), assess its scalability and efficiency in handling large-scale data processing, and report findings based on real-world datasets.

**Total: 30 Hours**

**References**

1. "Big Data: Concepts, Methodologies, Tools, and Applications", by Rajendra Akerkar, Wiley, 1st Edition, 2013.
2. "Data Analytics: Models and Algorithms", by Rajendra Akerkar, Springer, 1st Edition, 2015.
3. "Business Intelligence: A Managerial Perspective", by S. Parthasarathy and S. K. Gupta, PHI Learning, 1st Edition, 2016.
4. "Big Data Analytics: A Hands-On Approach", by S. Srinivasan, Wiley, 1st Edition, 2017.
5. "Data Mining: Concepts and Techniques", by S. K. Gupta and P. K. Sinha, PHI Learning, 1st Edition, 2014.

**List of e-Learning Resources:**

1. Introduction to Data Science with Python (DataCamp)https://www.datacamp.com/courses/intro-to-python-for-data-science
2. Deep Learning Specialization (Coursera - Andrew Ng, Deeplearning.ai) https://www.coursera.org/specializations/deep-learning
3. Big Data Analysis with Spark (edX - UC Berkeley)https://www.edx.org/course/big-data-analysis-with-spark

**Subject Tr.**          **Academic Coordinator**          **HoD**          **Sr. Faculty Nominated by DOAA**

L-2 T-1 P-0 C-3

**CSE1030: Blockchain Technology**

## Course Objectives

- To assess blockchain applications in a structured manner.
- To impart knowledge in block chain techniques and able to present the concepts clearly and structured.
- To get familiarity with future currencies and to create own crypto token.

### Course Outcomes (COs)

1. Describe the basic concepts and technology used for blockchain.
2. Describe the primitives of the distributed computing and cryptography related to blockchain.
3. Illustrate the concepts of Bitcoin and their usage.
4. Implement Ethereum block chain contract.
5. Apply security features in blockchain technologies.

### Articulation Matrix

*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

| CO/PO/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 2 | - | 1 | - | - | - | 2 | - | - | 1 | - | - |
| CO2 | 3 | 2 | 2 | 1 | 3 | - | 2 | - | 1 | - | 1 | 2 | 2 | 1 | 1 |
| CO3 | 3 | 3 | - | 2 | 3 | \2 | - | 1 | - | 1 | - | - | 1 | 2 | - |
| CO4 | 3 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 1 | - |
| CO5 | 3 | 3 | 3 | - | 3 | - | 1 | - | 2 | - | 1 | - | 1 | 1 | 1 |

High-3 Medium-2 Low-1

## PRACTICAL

1. Creating Blockchain using Python, mining new blocks, and displaying the whole blockchain.

2. Implementation of Blockchain

3. "Hello World" Smart Contract '

4. Simple Storage

5. multiple ethereum addresses

6. Ether Wallet.

7. polling smart contract

8. Voting system.

**TOTAL=30 Hours**

**Text Books:**

1. Bashir, Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained, 2nd Edition, 2nd Revised edition edition. Birmingham: Packt Publishing, 2018.

2. Daniel Drescher, Block chain basics A non-technical introduction in 25 steps, Apress , 2017.

3. Paul Vigna and Michael J.Casey. The Age of Cryptocurrency, 2015.

**Reference Books:**

1. A. M. Antonopoulos, Mastering bitcoin, First edition. Sebastopol CA: O'Reilly,2015.

2. Z. Zheng, S. Xie, H. Dai, X. Chen, andH. Wang, ―An Overviewof Blockchain Technology: Architecture, Consensus, and Future Trends,‖ in 2017 IEEE International Congress on Big Data (BigData Congress), 2017, pp.557–564

3. Narayanan, Bonneau, Felten, Miller and Goldfeder, "Bitcoin and Cryptocurrency Technologies – A Comprehensive Introduction", Princeton University Press.

4. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.

5. Imran Bashir, "Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained", Packt Publishing.

6. Merunas Grincalaitis, "Mastering Ethereum: Implement Advanced Blockchain Applications Using Ethereum-supported Tools, Services, and Protocols", Packt Publishing.

7. Prof. Sandip Chakraborty, Dr. Praveen Jayachandran, "Blockchain Architecture Design And Use Cases"[MOOC], NPTEL: https://nptel.ac.in/courses/106/105/106105184/

**Weblinks and Video Lectures (e-Resources):**

1. http://elearning.vtu.ac.in/econtent/courses/video/BS/14CPL16.html
2. https://nptel.ac.in/courses/106/105/106105171

L-2 T-1 P-0 C-3

**CSE1030: Blockchain Technology**

**Course Objectives**

- To assess blockchain applications in a structured manner.
- To impart knowledge in block chain techniques and able to present the concepts clearly and structured.
- To get familiarity with future currencies and to create own crypto token.

**Course Outcomes (COs)**

6. Describe the basic concepts and technology used for blockchain.
7. Describe the primitives of the distributed computing and cryptography related to blockchain.
8. Illustrate the concepts of Bitcoin and their usage.
9. Implement Ethereum block chain contract.
10. Apply security features in blockchain technologies.

**Articulation Matrix**

*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

| CO/PO/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 3 | 3 | 3 | 2 | - | 1 | - | - | - | 2 | - | - | 1 | - | - |
| CO2 | 3 | 2 | 2 | 1 | 3 | - | 2 | - | 1 | - | 1 | 2 | 2 | 1 | 1 |
| CO3 | 3 | 3 | - | 2 | 3 | \2 | - | 1 | - | 1 | - | - | 1 | 2 | - |
| CO4 | 3 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | 2 | 1 | - |
| CO5 | 3 | 3 | 3 | - | 3 | - | 1 | - | 2 | - | 1 | - | 1 | 1 | 1 |

High-3 Medium-2 Low-1

## UNIT I: INTRODUCTION TO BLOCKCHAIN TECHNOLOGY                     09 Hours

**Distributed DBMS** – Limitations of Distributed DBMS, Introduction to Blockchain Technology Definition, History, Types of Blockchain -Public, Private, Consortiums, Hybrid Blockchain Generic elements of Blockchain, Benefits of Blockchain.

**Cryptography in Blockchain –** Key Cryptography in blockchain, The Double-Spend Problem, Byzantine Generals' Computing Problems

## UNIT II: BLOCKCHAIN ARCHITECTURE                     09 Hours

**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), Consensus Model, Incentive Model.

## UNIT III: Ethereum Blockchain                     09 Hours

**Ethereum** - Ethereum - Ethereum blockchain, Ethereum blockchain Structure , Ethereum Virtual Machine, pre-compiled contracts, accounts and its types, mining, trading and investment, the ethereum network, applications developed on ethereum, scalability and security issues.

## UNIT IV: Distributed Ledger Technology (DLT) and BitCoin Blockchain                     09 Hours

**Introduction of  DLT**, Key Features, Challenges and Risks, Applications of DLT, Smart Contracts, Ethereum Smart Contracts (Permission-less Model) Hyperledger Fabric (Permissioned Model)

**BitCoin** - Introduction – Transactions – Structure - Transactions types – The structure of a block– The genesis block – The bitcoin network– Wallets and its types– Bitcoin payments– Bitcoin investment and buying and selling bitcoins – Bitcoin installation – Bitcoin programming and the command-line interface – Bitcoin improvement proposals (BIPs).

**UNIT V:  Block Chain Case study**            **09 Hours**

Blockchain in E-Governance, Land Registration, Medical Information Systems, and others

**TOTAL=45 Hours**

### PRACTICAL

9. Creating Blockchain using Python, mining new blocks, and displaying the whole blockchain.

10. Implementation of Blockchain

11. "Hello World" Smart Contract '

12. Simple Storage

13. multiple ethereum addresses

14. Ether Wallet.

15. polling smart contract

16. Voting system.

**Text Books:**

4. Bashir, Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained, 2nd Edition, 2nd Revised edition edition. Birmingham: Packt Publishing, 2018.

5. Daniel Drescher, Block chain basics A non-technical introduction in 25 steps, Apress , 2017.

6. Paul Vigna and Michael J.Casey. The Age of Cryptocurrency, 2015.

**Reference Books:**

8. A. M. Antonopoulos, Mastering bitcoin, First edition. Sebastopol CA: O'Reilly,2015.

9. Z. Zheng, S. Xie, H. Dai, X. Chen, andH. Wang, ―An Overviewof Blockchain Technology: Architecture, Consensus, and Future Trends,‖ in 2017 IEEE International Congress on Big Data (BigData Congress), 2017, pp.557–564

10. Narayanan, Bonneau, Felten, Miller and Goldfeder, "Bitcoin and Cryptocurrency Technologies – A Comprehensive Introduction", Princeton University Press.

11. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.

12. Imran Bashir, "Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained", Packt Publishing.

13. Merunas Grincalaitis, "Mastering Ethereum: Implement Advanced Blockchain Applications Using Ethereum-supported Tools, Services, and Protocols", Packt Publishing.

14. Prof. Sandip Chakraborty, Dr. Praveen Jayachandran, "Blockchain Architecture Design And Use Cases"[MOOC], NPTEL: https://nptel.ac.in/courses/106/105/106105184/

**Weblinks and Video Lectures (e-Resources):**

1. http://elearning.vtu.ac.in/econtent/courses/video/BS/14CPL16.html
2. https://nptel.ac.in/courses/106/105/106105171

L-2 T-1 P-0 C-3

**OPE107 TR1: E- Commerce and E- Governance**

**Course Objectives:**
- To discuss fundamentals of e-commerce, types and applications.
- To Learn role of the major types of information systems in a business environment and their relationship to each other
- To assess the impact of the Internet and Internet technology on business electronic commerce and electronic business
- To Learn and Identify the major e management challenges for building and using information systems and learn how to find appropriate solutions to those challenges
- To learn strategies for e-commerce, e government, Wireless Application Protocol, WAP technology and electronic payment system

**Course Outcomes (COs): Upon completion of this course students will be able to**
1. Understand the fundamental concepts of electronic commerce (e-commerce), including its history, types, advantages, disadvantages, and impact on businesses
2. Analyze the network infrastructure required for e-commerce, including internet and mobile commerce considerations, security threats, and mitigation strategies
3. Evaluate different online marketplaces, e-procurement methods, and e-payment systems, considering their functionalities, benefits, and limitations
4. Apply knowledge of electronic payment systems, including different payment methods, protocols, and emerging financial instruments
5. Understand the concept of e-government, its theoretical background and applications, along with the challenges, opportunities, and benefits it presents

**Articulation Matrix**
*(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)*

| CO/PO/PSO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | 2 | - | - | 1 | - | - | 2 | - | - | 1 | - | 2 | - |
| CO2 | - | 3 | 1 | 2 | - | - | 1 | 2 | - | 1 | 2 | - | - | 1 | 2 |
| CO3 | 1 | - | 3 | - | - | - | - | - | - | 2 | - | 1 | 3 | - | - |
| CO4 | 2 | - | - | 3 | - | - | - | 1 | 2 | - | 1 | - | - | - | 2 |
| CO5 | - | 1 | - | 1 | 2 | 3 | 1 | - | - | 1 | - | 2 | 2 | 1 | - |

High-3 Medium-2 Low-1

**7 Hours**

**UNIT I: Electronic Commerce** Introduction Definition of Electronic Commerce, Brief history of Ecommerce, e, E-Commerce: technology and prospects, incentives for engaging in electronic commerce, needs of E-Commerce, advantages and disadvantages, , Inter Organizational E-Commerce Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework ,Impact of E-commerce on business, E-Commerce Models.

**UNIT II: Network Infrastructure for E- Commerce**                **11Hours**
Network Infrastructure for E- Commerce Internet and Intranet based E-commerce- Issues, problems and prospects, Network Infrastructure, Network Access Equipments, Broadband telecommunication (ATM, ISDN, FRAME RELAY). Mobile Commerce: Introduction, Wireless Application Protocol, WAP technology, Mobile Information device. Emerging Client Server Security Threats, firewalls & Network Security

**UNIT III:E-Marketplaces**                **11 Hours**
E-Marketplaces, e Procurement and e Payment Systems Define e-Marketplace and Describe their Functions, Explain e-Marketplace types and their features, Describe the various types of auctions and list their characteristics, Discuss the benefits, limitations and impacts of auctions, E-Commerce in the wireless environment, Competition in the DE and impact on industry, Integration and e-Business suits, ERP, eSCM, CRM, e-Procurement definition, processes, methods and benefits , ePayment, Discuss the categories and users of smart cards, Describe payment methods in B2B EC

**7 Hours**

**UNIT IV: Electronic Payment System** Electronic Payment System Electronic Payments Overview of Electronics payments, Overview, The SET protocol, Payment Gateway, Digital Token based Electronics payment System, magnetic strip card, E-Checks, Smart Cards, Credit Card, Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

**UNIT V:E-Government**                                                                            **9 Hours**

e-Government Definition of e-Governments, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, Implementation, E-Government Services, Challenges and Opportunities, EGovernment Benefits, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

**Total: 45 Hours**

**Reference(s)**

1. Au, Y.A. & Kauffman, R.J. (2007). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application, Electronic Commerce Research and Applications

2. Engel-Flechsig, S. 2001. Securing the new global economy, Mobile Commerce World.

3. Tiwari, R., and Buse, S. 2007. The Mobile Commerce Prospects: A strategic analysis of opportunities in the banking sector (PDF). Hamburg: Hamburg University Press.

4. Pandey, S. (2013, April 23). Airtel Money. (G. S. Sambhy, Interviewer) Mumbai, Maharastra, India.

5. Pousttchi, K., Schiessler, M., & Wiedemann, D. G. (2007). Analyzing the Elements of the Business Mode

**List of elearning Recourses**
1. https://www.javatpoint.com/service-oriented-architecturess
2. https://www.geeksforgeeks.org/service-oriented-architecture/
3. https://nptel.ac.in

**Subject Tr.**        **Academic Coordinator**        **HoD**        **Sr. Faculty Nominated by DOAA**