| Semester: I/II | | | | | | |
|---|---|---|---|---|---|---|
| **ELEMENTS OF BLOCKCHAIN TECHNOLOGY**<br>**Category: Emerging Technologies**<br>**(Common to all Programs)**<br>**(Theory)** | | | | | | |
| **Course Code** | **:** | **CS114AT / CS124AT** | | **CIE** | **:** | 100 Marks |
| **Credits: L:T:P** | **:** | 3:0:0 | | **SEE** | **:** | 100 Marks |
| **Total Hours** | **:** | 36L | | **SEE Duration** | **:** | 3 Hours |

| **Unit-I** | **07 Hrs** |
|---|---|
| **Blockchain Fundamentals:** Defining Blockchain, Elements of Blockchain, Qualities of Blockchain, Blockchain and Economics, Blockchain Technology, Origins of Bitcoin and Blockchain, Types of Blockchains, Business and Blockchain, Use cases, Ethical issues with Blockchain. | |
| **Unit – II** | **07 Hrs** |
| **Blockchain Technology:** Blockchain technology stack, monetizing the Blockchain, Blockchain Wallet, Sorting Blocks, Consensus, Blockchain as a Service, IT Use cases for Blockchain-Storage, IPFS, Edge Computing, Web 3.0 and Blockchain, Obstacles in Blockchain. | |
| **Unit –III** | **07 Hrs** |
| **Bitcoin and Crypto-assets:** Introduction to Crypto-assets, Crypto-currencies, Crypto-commodities, Crypto-tokens, Bitcoin, Ethereum, Digital Token Exchanges, Financial modelling for cryptocurrencies. | |
| **Unit -IV** | **07 Hrs** |
| **Ethereum and Smart Contracts:** Basics of Ethereum, Ethereum Virtual Machine, Ether, Smart Contract, On-chain versus Off-chain versus Side chain, Mining Ethereum. | |
| **Unit-V** | **08 Hrs** |
| **Blockchain Use Cases:** Cross-functional Blockchain Use cases – Identity management, Asset Tracking, IoT integration; Functional Area Blockchain Use Cases for Business – Finance, Marketing/Sales, Supply Chain Management, Accounting, Human Resources; Use Cases for Specific Industries – Insurance, Real Estate, Healthcare, Energy. | |

| **Course Outcomes: After completing the course, the students will be able to** | |
|---|---|
| **CO1** | Apply the knowledge of Blockchain in some of the Industrial Use Cases. |
| **CO2** | Analyse the working of some of the Blockchain solutions in Business Use Cases. |
| **CO3** | Use some of the modern tools of Blockchain, such as Ethereum to solve real world problems. |
| **CO4** | Appreciate ethical implications of using Blockchain technologies. |
| **CO5** | Assess the impact and importance of the Blockchain technologies on social security. |

| **Text Books** | |
|---|---|
| **1** | Basics of Blockchain – A guide for building literacy in the economics, technology and business of blockchain, Bettina Warburg , Bill Wagner, and Tom Serres, 2019, Animal Ventures LLC, Edition 1.0. |
| **Reference Books** | |
| **1** | Mastering Blockchain – Distributed ledger technology, decentralization and smart contracts, Imran Bashir, 2018, Packt, Second Edition. |

| RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) | | |
|---|---|---|
| **#** | **COMPONENTS** | **MARKS** |
| **1** | **QUIZZES:** Quizzes will be conducted in online/offline mode. TWO QUIZZES will be conducted & Each Quiz will be evaluated for 10 Marks. **THE SUM OF TWO QUIZZES WILL BE THE FINAL QUIZ MARKS.** | **20** |
| **2** | **TESTS:** Students will be evaluated in test, descriptive questions with different complexity levels (Revised Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating). TWO tests will be conducted. Each test will be evaluated for 50 Marks. **FINAL TEST MARKS WILL BE REDUCED TO 40 MARKS.** | **40** |
| **3** | **EXPERIENTIAL LEARNING:** Students will be evaluated for their creativity and practical implementation of the problem. Case study-based teaching learning (05), Program specific requirements (05), Video based seminar/presentation/demonstration (10), **MATLAB (20) ADDING UPTO 40 MARKS**. | **40** |
| | **MAXIMUM MARKS FOR THE CIE THEORY** | **100** |

| RUBRIC FOR SEMESTER END EXAMINATION (THEORY) | | |
|---|---|---|
| **Q. NO.** | **CONTENTS** | **MARKS** |
| | **PART A** | |
| **1** | Objective type questions covering entire syllabus | 20 |
| | **PART B**<br>(Maximum of TWO Sub-divisions only) | |
| **2** | Unit 1 : (Compulsory) | 16 |
| **3 & 4** | Unit 2 : Question 3 or 4 | 16 |
| **5 & 6** | Unit 3 : Question 5 or 6 | 16 |
| **7 & 8** | Unit 4 : Question 7 or 8 | 16 |
| **9 & 10** | Unit 5: Question 9 or 10 | 16 |
| | **MAXIMUM MARKS FOR THE SEE THEORY** | **100** |