

| Semester: I/II | | | | |
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| INTRODUCTION TO INTERNET OF THINGS | | | | |
| Category: Emerging Technologies (Common to all Programs) (Theory) | | | | |
| Course Code | : | AI114AT / AI124AT | CIE | : 100 Marks |
| Credits: L:T:P | : | 3:0:0 | SEE | : 100 Marks |
| Total Hours | : | 40L | SEE Duration | : 3 Hours |

| Unit – I | 09 Hrs |
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| Applications: Asset Management, Biometrics Identification, Smart Home, Bird Strike Avoidance Radar System, River Navigation Safety System. Introduction: IoT Concept, Related Concepts to IoT, The Intrinsic Characteristics of IoT, IoT Development and Application, Future IoT Vision. Architecture and Fundamentals: Research on IoT Architecture, Ubiquitous IoT (U2IoT) Architecture, Layered Models for IoT, Layered Model Proposed and Social Attributes Discussion for U2IoT, IoT Development Phases Summary and Discussion, Science Category and Supporting Technologies for IoT. | |
| Unit – II | 07 Hrs |
| Sensors and Actuators for IoT: Introduction, Sensors and Actuators, Ubiquitous Sensing, Networking and Communications, Management and Data Centers (M&DCs), Case Study for IoT. | |
| Unit – III | 08 Hrs |
| Ubiquitous Internet of Things: Introduction, Local Internet of Things, Industrial Internet of Things, National Internet of Things, Transnational Internet of Things Application, Global Application IoT and a Typical Example. | |
| Unit – IV | 08 Hrs |
| Resource Management: Introduction, Object Coding and Resolving, Resolving Discussion for nID Objects, Resource Naming, Recourse Addressing, Resource Discovery, Resource Allocation, Resource Management Scheme in U2IoT. | |
| Unit – V | 08 Hrs |
| Security and Privacy for IoT: Introduction, Security Challenges in U2IoT, The Security Framework for U2IoT, Hybrid Authentication and Hierarchical Authorization Scheme, Entity Activity Cycle–Based Security Solution. | |

| Course Outcomes: After completing the course, the students will be able to | |
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| CO1 | Apply the knowledge of IoT and related science to solve the engineering problems. |
| CO2 | Analyse the applicability of IoT in various application domains. |
| CO3 | Design a sustainable solution using IoT with societal and environmental concern by engaging in lifelong learning for emerging technology. |
| CO4 | Demonstrate the solutions using various IoT principles by exhibiting team work and effective communication. |

| Reference Books | |
|-----------------|---|
| 1 | Huansheng Ning - Unit and Ubiquitous Internet of Things, CRC Press; 1st edition,2018, ISBN-10: 113837475X, ISBN-13 : 978-1138374751 |
| 2 | Hakima Chaouchi - The Internet of Things Connecting Objects to the Web, Wiley-ISTE; 1st Edition,2010, ISBN-10:1848211406, ISBN-13: 978-1848211407 |
| 3 | Adrian McEwen, Hakim Cassimally - Designing the Internet of Things, Wiley,1st edition,2013, ISBN-10 : 111843062X ,ISBN-13 : 978-1118430620 |
| 4 | Dawid Borycki - Programming for the Internet of Things PHI Learning Pvt. Ltd, Microsoft Press,2019,ISBN-10 : 9387472558 ,ISBN-13 : 978-9387472556 |

| RUBRIC FOR THE CONTINUOUS INTERNAL EVALUATION (THEORY) | | |
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| # | 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) | | |
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| Q. NO. | CONTENTS | MARKS |
| PART A | | |
| 1 | Objective type questions covering entire syllabus | 20 |
| PART B (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 |