

CSE6102: Analytics for the Internet of Things

Programme: M.Tech. (CSE)
Course: Program Elective

Year: I
Credits: 3

Semester: 2
Hours: 40

Course Context and Overview:

The course will help learn how to extract actionable intelligence from the flood of IoT data. This Course will help one become skilled at extracting value from IoT big data using multiple analytic techniques. Student will learn how to overcome the unique challenges associated with Internet of Things data and master various strategies to optimize the data for analytics via step-by-step descriptions. The course will start with the perplexing task of extracting value from huge amounts of barely intelligible data. Further, a student will learn how value can be derived from the data through visualizations and statistical modeling techniques.

Prerequisites Courses: NIL

Course Outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Understand the variety of transmission protocols for IoT along with their strengths and weaknesses
CO2: Understand how data flows from the IoT device to the final data set, where it can be used for analytics
CO3: Use machine learning as a predictive method on IoT data
CO4: Apply geospatial analytics to IoT data
CO5: Implement best strategies to get the most from IoT analytics

Course Topics:

Contents	Lecture Hours
UNIT 1	
Introduction:	
1.1 Defining IoT analytics	2
1.2 IoT analytics challenges	
1.2.1 Data volume	
1.2.2 Problems with time and space	
1.2.3 Data quality	
UNIT 2	
IoT Devices and Networking Protocols	
2.1 IoT devices	

2.2 Networking basics – connectivity protocols, data messaging protocols	6
UNIT 3 IoT Analytics for the Cloud	
3.1 Building elastic analytics	
3.2 Designing for scale	
3.3 Overview of AWS - concepts, core services, key services for IoT analytics, Creating and AWS cloud analytics environment	8
UNIT 4 Visualize IoT Data	
4.1 Collect, Organize, Explore and Visualize IoT data – strategies, techniques and tools	10
UNIT 5 Data Science for IoT Analytics	
5.1 Machine learning	6
5.2 Forecasting	
5.3 Deep learning	
UNIT 6 IoT Application Requirements and Services	
6.1 Use Cases	8

Textbook references:**Suggested Readings:**

1. Andrew Minter, “*Analytics for the Internet of Things (IoT)*”: *Intelligent analytics for your intelligent devices*, II edition, Packt Publishing, 2017
2. Fawzi Behmann and Kwok W, “*Collaborative Internet of Things (C-IoT)*”: *For Future Smart Connected Life and Business*, Wiley, June 2015
3. Pethuru Raj and Anupama C. Raman, “*The Internet of Things*”: *Enabling Technologies, Platforms, and Use Cases*, CRC Press, 2017
4. Arshdeep Bahga and Vijay Madisetti, “*Internet of Things*”: *A Hands-on Approach*, Universities Press, 2018
5. Research Papers

Evaluation Methods:

Item	Weightage (%)
Quiz /Assignment/Lab	30
Mid Term	30
End Term	40

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