

Nirma University
Institute of Technology, School of Technology
M. Tech. Computer Science and Engineering (Data Science)
Semester – II

L	T	P	C
2	0	2	3

Course Code	3CS42D201
Course Name	Analytics for the IoT

Course Learning Outcomes (CLOs):

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

1. implement the architectural components and protocols for application development
2. identify data analytics and data visualization tools as per the problem characteristics
3. collect, store and analyse IoT data

Syllabus:

**Teaching
Hours**

Unit I

Introduction to IoT, applications, IoT architectures, introduction to analytics, IoT analytics challenges

2

Unit II

IoT devices, Networking basics, IoT networking connectivity protocols, IoT networking data messaging protocols, Analyzing data to infer protocol and device characteristics

7

Unit III

IoT Analytics for the Cloud: Introduction to elastic analytics, Decouple key components, Cloud security and analytics, Designing data processing for analytics, Applying big data technology to storage

5

Unit IV

Exploring IoT Data: Exploring and visualizing data, Techniques to understand data quality, Basic time series analysis, Statistical analysis

6

Unit V

Data Science for IoT Analytics: Introduction to Machine Learning, Feature engineering with IoT data, Validation methods, Understanding the bias–variance tradeoff, Use cases for deep learning with IoT data

5

Unit VI

Strategies to Organize Data for Analytics: Linked Analytical Datasets, Managing data lakes, data retention strategy

5

Self Study:

The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

Laboratory Work:

Laboratory work will be based on above syllabus with minimum 5 experiments to be incorporated.

Suggested Readings[^]:

1. Minter, Andrew, Analytics for the Internet of Things (IoT), Packt Publishing Ltd.
2. Kai Hwang, Min Chen, Big-Data Analytics for Cloud, IoT and Cognitive Computing, Wiley
3. Hwaiyu Geng, Internet of Things and Data Analytics Handbook, Wiley
4. John Soldatos, Building Blocks for IoT Analytics Internet-of-Things Analytics, RiverPublishers
5. Gerardus Blokdyk, IoT Analytics A Complete Guide, 5starcooks

L=Lecture, T=Tutorial, P=Practical, C=Credit

[^]this is not an exhaustive list