NIRMA UNIVERSITY
Institute of Technology
B. Tech. Computer Science and Engineering
Open Elective (open to all branches except Dept. of CSE)

L	T	P	C
3	0	0	3

Course Code	2CSOE01
Course Title	IoT Analytics

Course Outcomes:

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

1. comprehend the architectural components and platforms of IoT ecosystem
2. apply appropriate access technology and protocols as per the application requirement
3. appreciate the role of big data, cloud computing and data analytics in a typical IoT system
4. design applications with suitable lightweight data processing and communication methodologies.

Syllabus:

	Teaching Hours
Unit I **Introduction to IoT:** importance and applications, IoT architectures, introduction to analytics, IoT analytics challenges	**04**
Unit II IoT devices, Networking basics, IoT networking connectivity protocols, IoT networking data messaging protocols, Analyzing data to infer protocol and device characteristics	**12**
Unit III **IoT Analytics for the Cloud:** Introduction to elastic analytics, Cloud security and analytics, Designing data processing for analytics, Applying big data technology to storage	**08**
Unit IV **Exploring IoT Data:** Exploring and visualizing data, Techniques to understand data quality, Basic time series analysis, Statistical analysis	**08**
Unit V **Data Science for IoT Analytics:** Introduction to Machine Learning, Feature engineering with IoT data, Validation methods, Understanding the bias–variance trade-off, Use cases for deep learning with IoT data	**07**

Unit VI **06**

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

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.

Suggested Readings^:

1. Minteer, 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. HwaiyuGeng, 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