NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
Course Syllabus
Master of Computer Application (2-Years Programme) Semester-II

L	T	P	C
2	0	2	3

Course Code	6CS153
Course Name	Internet of Things

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 protocol as per the application requirement
3. develop applications on IoT platform

Syllabus:

Teaching Hours: 30

Unit I

Introduction, applications, need and scope of IoT, Various IoT architectures, functional stack, Processors and Operating Systems for resource constrained devices — **5**

Unit II — **8**

sensors and actuators, smart objects, connecting objects, protocols and access technologies like IEEE802.15.4, LFNBPLC, LoRaWAN, WirelessHART, LTE-M, BLE, NB-IoT.

Unit III — **4**

IoT network layer, IPv6: Revisit to IPv6 structure, addressing, routing, interconnecting issues, 6LoWPAN: forwarding, addressing, header compression, neighbour discovery, Routing in LLN, RPL

Unit IV — **9**

Application layer protocols, CoAP, MQTT, AMQP, XMPP, Integrating Internet services with interoperable data encoding with XML, JSON and CBOR, sensor data models and representation, the sensor mark-up language (SENML), lightweight web services for IoT

Unit V

Case studies on IoT applications: connected vehicles, autonomous vehicles, industrial applications of IoT. — **4**

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.

w.e.f. Academic Year 2020-21 onwards

Laboratory Work:

Laboratory work will be based on above syllabus with minimum 8 experiments to be incorporated that will be considered for evaluation.

Suggested Readings^:

1. David Hanes, G. Salgueiro, IoT Fundamentals - Networking Technologies, Protocols, and Use Cases for Internet of Things, Cisco Press
2. Jean-Philippe Vasseur, Adam Dunkels, Interconnecting Smart Objects with IP: The Next Internet, Morgan Kaufmann
3. Pethuru Raj, Anupama Raman, The Internet of Things - Enabling Technologies, Platforms and Use Cases, CRC Press
4. Robert Stackowiak, Art Licht, VenuMantha and Louis Nagode, Big Data and The Internet of Things, Apress
5. Peter Waher, Learning Internet of Things, Packt Publishing Ltd
6. Daniel Kellmereit, Daniel Obodovski, The Silent Intelligence: The Internet of Things, DND Ventures
7. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, Wiley Publications

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

^this is not an exhaustive list