Paper Cade: BCADSE 6.4	**Paper title: Elective-III:** b. Internet of Things	**Teaching Hours** – 5 hrs/week
Total Teaching Hours: 60 Hrs.	**Marks:** Th-80+IA-20	**Credits**: 4

UNIT I:
Introduction of Internet of Things: Introduction: Definition and characteristics of IOT, Physical design of IOT: Things in IOT, IOT Protocols, Logical Design of IOT: IOT Functional Blocks, IOT Communication Models, IOT Communication APIs, IOT Enabling Technologies: Wireless Sensors Networks, Cloud Computing, Big Data Analytics, Communication Protocols and embedded System, IOT Level and Deployment Templates: IOT level-1, level-2, level-3, level-4, level-5 and level-6. **12 Hrs**

UNIT II:
Domain Specific IOTs and M2M: Introduction: Home Automation, Cities, Environment, Energy, Retail, Logisitics, Agriculture, Industry and Health & Lifestyle, Introduction to M2M, M2M, difference between IOT and M2M, SDN and NFV for IOT: Software Defined Networking , Network Function Virtualization **12 Hrs**

UNIT III:
Developing Internet of Things :IOT Design Methodology : Step 1 to Step 10, IOT System Logical Design using Python: Data types & data structures, control flow, functions , modules, packages, date /time operations and classes**12 Hrs**

UNIT IV:
IOT Physical Device and Endpoints: What is IOT Device, Basic building blocks of an IOT, Exemplary Device: Raspberry Pi, About Board, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry Pi with Python. **12 Hrs**

UNIT V:
Case study Illustrating IOT Design: Smart Lighting, Home intrusion Detection, Smart parking, Weather Monitoring System, Weather Reporting Bot, Air Pollution Monitoring, forest fire Detection, Smart Irrigation and IOT Printer.
12Hrs

References:

1. ArshdeepBahga, Vijay Madisetti, —Internet of Things – A hands-on approach, Universities Press, 2015
2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012 (for Unit2).
3. Jan Ho¨ ller, VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence", Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer,2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media,2011.