

ITE6004 Internet of Things

L T P J C
3 0 0 4 4

Pre-Requisite : Nil

Objectives :

1. To study the hardware design of IoT objects
2. To understand the software development framework for Internet of things.
3. To learn the cross platform enabling technologies in IoT

Expected Outcome :

1. To develop prototypes for domain specific IoT's.
2. To implement IoT applications for various domains.
3. To customize real time data for IoT applications.

	Topics	L Hrs	SLO
1	Building IoT: Characterization of IoT - Physical design- Things in IoT- IoT protocols- Logical Design. Enabling Technologies.	6	2
2	IoT Systems: IoT levels and deployment templates -six levels	5	2
3	Domain Specific IoT's: Smart home- smart city- Environment- Energy-Retail- Logistics- Industry- Agriculture- Health and Lifestyle	5	2
4	IoT platforms design methodology: Process Specification- Domain model specification- Information model specification- Service specification- IoT level specification- Functional view specification- Operational view specification- Device and component integration- Application development - Case Studies	6	2
5	Physical Devices and End points: Basic building blocks of IoT device- Examples – Raspberry PI interfaces – Arduino interfaces – programming Raspberry Pi with Python –Other IoT devices	6	6
6	IoT physical servers and cloud offerings: Introduction to cloud storage models and communication APIs- Xively cloud for IoT – Python web application framework – Django- Designing RESTful web API- Amazon web services for IoT	7	6
7	IoT Analytics: Batch Data Analysis-Real-time Data Analysis-Case Studies: Object Tracking , Anomaly Detection, Mobility Pattern Analytics, Crowd Analytics, Behavior Learning and Prediction	7	6
8	Expert Talk on IoT Applications	3	
Total Lecture Hours		45	
# Mode: Flipped Class Room, [Lecture to be videotaped], Use			

of physical and computer models to lecture, Visit to Industry, Min of 2 lectures by industry experts		
Text Books 1. Arshdeep Bahga, Vijay Madisetti “Internet of Things - A Hands-on Approach”, Universities Press, First Edition, 2015. Reference Books 1. Dieter Uckelmann, Mark Harrison Florian, Michahelles “Architecting the Internet of things”, Springer-Verlag Berlin Heidelberg, First Edition, 2011.		
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STUDENT LEARNING OUTCOMES (SLO)

1. Having an ability to apply mathematics and science in engineering applications
2. **Having a clear understanding of the subject related concepts and of contemporary issues**
3. Having an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient)
4. Having Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)
5. Having design thinking capability
6. **Having an ability to design a component or a product applying all the relevant standards and with realistic constraints**
7. Having computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)
8. Having Virtual Collaborating ability
9. Having problem solving ability- solving social issues and engineering problems

10. Having a clear understanding of professional and ethical responsibility
11. Having interest in lifelong learning
12. Having adaptive thinking and adaptability
13. Having cross cultural competency exhibited by working in teams
14. Having an ability to design and conduct experiments, as well as to analyze and interpret data
15. Having an ability to use the social media effectively for productive use
16. Having a good working knowledge of communicating in English
17. Having an ability to use techniques, skills and modern Engineering tools necessary for engineering practice
18. Having critical thinking and innovative skills
19. Having a good cognitive load management skills
20. Having a good digital footprint