UE18CS313: INTERNET OF THINGS (4:0:0:0:4)

# of Credits: 4   **# of Hours: 56**

Class #	Chapter Title / Reference Literature	Topics to be Covered	% of Portion covered	
			% of Syllabus	**Cumulative %**
1	**Unit#1** **Introduction** T1: Ch1 and Ch2	What is IOT? Trends in adoption of IOT	**21.4%**	**21.4%**
2		Convergence of IT and IoT, Challenges in IoT		
3		IOT network Architecture and design		
4		Physical design and logical design, Behind New Network Architectures		
5		Comparing IoT Architectures		
6		A Simplified IoT Architecture		
7		The Core IoT		
8		IOT Design Methodology		
9		Domain specific IOT, Functional Stack		
10		IoT Data Management and Compute Stack		
11		Hands-on Session on Microcontrollers		
12		Hands-on Session on Microcontrollers		
13	**Unit#2** **Smart objects** T1: Ch3 and Ch4	Smart Objects: The "Things" in IoT, Sensors	**17.8%**	**39.2%**
14		Actuators, Smart Objects		
15		Sensor Networks		
16		Connecting Smart Objects		
17		Communications Criteria		
18		Communications Criteria		
19		IoT Access Technologies		
20		IoT platforms, Programming with Arduino, Programming with Raspberry Pi and Node MCU		
21		Hands-on Session on Connecting Smart Objects		
22		Hands-on Session on Connecting Smart Objects		
23	**Unit #3** **IP as the IoT network Layer** T1: Ch5 and Ch6	IP as the IoT Network Layer -The Business Case for IP	**21.4%**	**60.6%**
24		The Need for Optimization		
25		Optimizing IP for IoT		
26		Optimizing IP for IoT		
27		Profiles and Compliances		
28		Application Protocols for IoT -The Transport Layer		
29		IoT applications transport methods		
30		IoT applications transport methods		
31		Networking technologies, Communication aspects Wireless medium access issues		
32		Common protocols, Software & Management Tools for IoT		
33		Hands-on Session on Protocols		
34		Hands-on Session on Protocols		
35	**Unit#4**	Data and Analytics for IoT - An Introduction to DataAnalytics for IoT		
36		Machine Learning		
37		Big Data Analytics Tools and Technology		

38	**Data and Analytics for IoT** T1: Ch7 and Ch8	Edge Streaming Analytics		
39		Network Analytics		
40		**Securing IoT** : A Brief History of OT Security, Common Challenges in OT Security	**21.4%**	**82.0%**
41		How IT and OT Security Practices and Systems Vary		
42		Formal risk analysis structures-OCTAVE and FAIR		
43		The Phased Application of Security in an Operational Environment		
44		Identify and analyze IoT security, Privacy risks		
45		Hands-on Session on IOT Analytics		
46		Hands-on Session on IOT Analytics		
47	**Unit#5** **Case Studies and Advanced Topics** T1: Ch12	**Case Studies and Advanced Topics** IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino, UNO		
48		FundamentalsofArduino Programming.		
49		IoT Physical Devices and Endpoints-RaspberryPi: Introduction to RaspberryPi		
50		About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi		
51		Programming RaspberryPi with Python		
54		Introduction to ESP32 Dev Board , Programming ESP32 with Arduino		
55		Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture, Smart City Security Architecture, Smart City	**17.8%**	**100%**
56		Home automation, Industry applications, Surveillance applications, Rural IoT, Various Real time applications of IoT		

Book Type	Code	Title & Author	Publication Information		
			Edition	Publisher	Year
Text Book	T1	IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things -David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry	1	Pearson	2017
Reference Book	R1	Internet of Thingshands-on approach-Arshdeep Bahga, Vijay Madisetti	1	OrientBlackswan Private Limited	2015
	R2	Designing the Internet of Things - Adrian McEwen, HakinCassimally	1	Wiley	2013
	R3	Enterprise IoT by Dirk Slama, Frank Puhlmann, Jim Morrish, Rishi M Bhatnagar	1	O'Reilly	2015