



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 1 of 7

Department of EEE	LP:EE18011
B.E/B.Tech/M.E/M.Tech : B.ERegulation: 2018	Rev. No: 01
UG/PG Specialization: EEE(PROFESSIONAL ELECTIVE)	Date:
Sub. Code / Sub. Name : EE18011 IoT FOR ELECTRICAL ENGINEERS	12.07.2023
Unit : I	

UNIT I BASIC CONCEPTS OF IoT

9

Introduction and evolution of IoT from internet, IOT Physical Devices & Endpoints Basic building blocks and Exemplary IOT Device: Raspberry Pi, Linux on Raspberry Pi, Raspberry Pi Interfaces - Serial , SPI , I2C , Programming Raspberry Pi with Python - Controlling LED with Raspberry Pi , Interfacing an LED and Switch with Raspberry Pi , Interfacing a Light Sensor (LDR) with Raspberry Pi , Other IoT Devices - Arduino with embedded C, Intel Galileo, pcDuino , BeagleBone Black , Cubieboard.

Objective: To understand basic concept of IoT architecture and Programming Raspberry Pi with Python

Session No *	Topics to be covered	Ref	Teaching Aids
1	IoT architecture and Building blocks	1,2,3	PPT
2	Raspberry Pi – architecture and features	1,2,3	PPT
3	Raspberry Pi Interfaces - Serial , SPI , I ² C ,Linux on Raspberry Pi	13,14	PPT, Demo
4	Basic Programming in Raspberry Pi using Python, Introduction to Python coding	13,14	PPT, Demo
5	Controlling LED with Raspberry Pi	13,14	Hands-on
6	Interfacing an LED and Switch with Raspberry Pi	13,14	Hands-on
7	Interfacing a Light Sensor (LDR) with Raspberry Pi	13,14	Hands-on
8	Introduction to Arduino with embedded C, Intel Galileo (Other IoT devices)	1,15	PPT
9	Introduction to pcDuino , BeagleBone Black , Cubieboard (Other IoT devices)	1,2,3	PPT

Content beyond syllabus covered (if any): On-board temperature sensing using Raspberry Pi - PicoW

* Session duration: 50 minutes



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 2 of 7

Sub. Code / Sub. Name: **EE18011 IoT FOR ELECTRICAL ENGINEERS**

Unit : II

UNIT II HOME AND BUILDING AUTOMATION

9

Adaptive lighting- Wireless and internet-enabled lights – control by web and mobile applications- control and management of smart appliances-systems for detecting and responding to intrusions-surveillance systems-Detection systems for smoke and gas - Video, audio, and projector control in the home.

Objective: To understand need for automating home appliances and methods to implement.

Session No *	Topics to be covered	Ref	TA
10	Introduction to Home and Building automation	1,2,7	PPT
11	Adaptive lighting- Wireless and internet-enabled lights	1,2,7	PPT & Video
12	Control by web and mobile applications	1,2,5,7	PPT, Demo
13	Control and management of smart appliances	1,2,5,7	PPT
14	Control and management of smart appliances- contd.	1,2,7	PPT
15	Systems for detecting and responding to intrusions&surveillance systems	1,2,7	PPT, Demo
16	Detection systems for smoke and gas	1,2,7	PPT, Hands-on
17	Audio and Video control in home.	1,2,7	PPT, video
18	Projector control in home.	1,2,7	PPT
	CAT 1		

Content beyond syllabus covered (if any): Develop coding for home automation and implement in Raspberry Pi-Pico W.



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 3 of 7

Sub. Code / Sub. Name: **EE18011 IoT FOR ELECTRICAL ENGINEERS**

Unit : III

UNIT III INDUSTRIES

9

Connecting sensors, actuators, control systems, and machines to optimize production and supply chain networks in manufacturing- automation of process controls in process industries- service information systems, and operator tools to increase productivity and safety. Impact of IoT: real time monitoring and controlling operations- deploying intelligent equipment, sensors, and controllers - Automation and control.

Objective: To understand basic concept of Industrial automation and impact of IoT.

S. No.	Topics to be covered	Ref	TA
19	Introduction to control systems (Open loop and closed loop) and Automation.	1,6,8	PPT/ Video
20	Introduction to sensors, actuators and machines involving in a process- Examples.	1,6,8	PPT
21	Interconnection of sensors, actuators, control systems, and machines to optimize production.	1,5, 6,8	PPT
22	Interconnection of sensors, actuators, control systems, and machines to optimize supply chain networks in manufacturing	1,6,8	PPT
23	Service information systems, and operator tools to increase productivity and safety.	1,6,8	PPT
24	Impact of Internet of Things in Industries- various possibilities.	1,6,8	PPT
25	Real time monitoring and controlling operations- Need of IoT- Examples.	1,6,8	PPT
26	Adding Intelligence into equipment, sensors, and controllers.	1,5, 6,8	PPT
27	Automation and control with IoT - Examples.	1,6,8	PPT
Content Beyond the syllabus: IoT based temperature monitoring and control using Raspberry Pi Pico W			

* Session duration: 50 minutes



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: **EE18011 IoT FOR ELECTRICAL ENGINEERS**

Unit : IV

UNIT IV ENERGY

9

Smart grid - automation, distribution, and monitoring- Advanced Infrastructure for Measuring – SCADA- Smart Inverters- Remote operation of devices that use energy- connecting solar panels, rainwater harvesters, smart roof, and windows in one system-Observable, automated, and controllable green energy using IoT sensors - IoT solutions in renewable energy power production

Objective: To understand structure of smart grid, smart buildings and impact of IoT.

SNo *	Topics to be covered	Ref	TA
28	Impact of IoT in Energy Sector and Power grid.	1,9,10	PPT
29	Introduction to Smart grid - Overview on Distribution Automation and Advanced Metering Infrastructure (AMI).	1,9,10	PPT
30	Introduction to Supervisory Control and Data Acquisition System (SCADA) - SCADA in Power System and Industries- Overview.	1,9,10	PPT
31	Introduction to IoT sensors.	1,5,9,10	PPT
32	Smart Inverters and Remote operation of devices and energy required - Choice of Solar Panels.	1,9,10	PPT
33	Smart Inverters and Remote operation of devices and energy required - Choice of Solar Panels.	1,9,10	PPT
34	Impact of IoT in Buildings -Rainwater harvesters, smart roof, and windows in one system.	1,9,10	PPT/ Video
35	Observable, automated, and controllable green energy using IoT sensors	1,9,10	PPT
36	Problems associated with renewable energy power production and IoT solutions.	1,9,10	PPT
	CAT2		

Content beyond syllabus covered (if any): IoT in Smart grid and IoT impact in Indian Power System.

* Session duration: 50 minutes



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 5 of 7

Sub. Code / Sub. Name: **EE18011 IoT FOR ELECTRICAL ENGINEERS**

Unit : V

UNIT V ELECTRIC VEHICLE

9

Intelligent smart controllers - EV charging station locator- Smart charging stations - Battery monitoring and management - Vehicular traffic and smart parking.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Overview on Electric Vehicle and its charging infrastructure.	11	PPT
38	Controllers involved Electric Vehicles	11	PPT
39	Adding smartness into controllers -smart controllers - smart charging stations	1,11,12	PPT
40	Intelligent smart controllers	1,11,12	PPT
41	EV charging station locator	1,11,12	PPT
42	Smart charging stations	1,11,12	PPT/ Video
43	Battery monitoring and management - Voltage, temperature, SoC, SoH monitoring.	1,11,12	PPT/ Video
44	Battery monitoring and management - Thermal management.	1,11,12	PPT
45	Vehicular traffic and smart parking.	1,11,12	PPT
	CAT3		

Content beyond syllabus covered (if any): IoT in Battery Management system- Python coding.



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Page 6 of 7

TEXT BOOK:

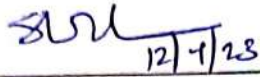
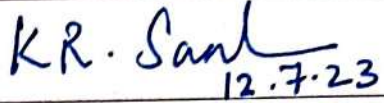
1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things : A hands on approach", First Edition, Universities Press, 2015.
2. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
3. Dieter Uckelmann Mark Harrison; Florian Michahelles, "Architecting the Internet of Things", Springer, 2011.

REFERENCES:

4. Peter Waher, 'Learning Internet of Things', Packt Publishing, 2015
5. N. Ida, Sensors, Actuators and Their Interfaces, Scitech Publishers, 2014.
6. Sudip Misra, "Introduction to IoT", Cambridge University Press, 2015.
7. S. Mukhopadhyay, S. Sen and A. K. Deb, "Industrial Instrumentation, Control and Automation", Jaico Publishing House, 2013.
8. Z. Huang, "Analysis of IoT-based Smart Home Applications," 2021 IEEE International Conference on Computer Science, Artificial Intelligence and Electronic Engineering (CSAIEE), 2021, pp. 218-221, doi: 10.1109/CSAIEE54046.2021.9543308.
9. <https://www.iotworldtoday.com/2017/09/20/top-20-industrial-iot-applications/>
10. Janaka Ekanayake, Nick Jenkins, Kithsiri Liyanage, Jianzhong Wu, Akihiko Yokoyama, —Smart Grid: Technology and Applications I, Wiley & Sons Ltd., February 2012.
11. N. Joshi, D. Nagar and J. Sharma, "Application of IoT in Indian Power System," 2020 5th International Conference on Communication and Electronics Systems (ICCES), 2020, pp. 1257-1260, doi: 10.1109/ICCES48766.2020.9137970.
12. Iqbal Hussein, Electric and Hybrid Vehicles: Design Fundamentals, CRC Press, Second edition, 2011.
13. L. Yao, Y. -Q. Chen and W. H. Lim, "Internet of Things for Electric Vehicle: An Improved Decentralized Charging Scheme," 2015 IEEE International Conference on Data Science and Data Intensive Systems, 2015, pp. 651-658, doi: 10.1109/DSDIS.2015.41.
14. <https://realpython.com/python-raspberry-pi/>
15. <https://learn.sparkfun.com/tutorials/python-programming-tutorial-getting-started-with-the-raspberry-pi/all#experiment-1-digital-input-and-output>
16. <https://docs.arduino.cc/arduino-cloud/getting-started/iot-cloud-getting-started>



SRI VENKATESWARA COLLEGE OF ENGINEERING
COURSE DELIVERY PLAN - THEORY

	Prepared by	Approved by
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Date	12.07.2023	12.07.2023
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD