



Course Title: **Cloud based Sensors Interfacing**

L	T	P/S	SW/F W	No. of PSDA	TOTAL CREDIT UNITS
0	1	0	2	3	2

Course Code: to be decided later

Credit Units: 2

Level: UG

	Course Title: Cloud based Sensors Interfacing	Comments (if any)
1	Course Objectives: This course intends the students to understand the basic concept of cloud-based server communication and sensor data uploading using Raspberry Pi and Node MCU	
2	Prerequisites: Basic Electrical Engineering, Basic Electronics Engineering, Basics of Digital Electronics	
3	Course Learning Outcomes: The students will be able to <ul style="list-style-type: none">Analyse sensor interfacing and cloud communicationApply sensor interfaces to cloudCreate cloud and sensor-based project.	
4	Module I Cloud Server Basic functionality of Raspberry Pi board, its processor setting and configuring the board, differentiating Raspberry Pi board with another platform like Arduino. Overclocking component overview.	30%
5	Module II Fundamentals of Arduino Board and Programming Free inbuilt Cloud Server, Paid Server, Create your own Server for sensor data, SQL Server and Database, My SQL server and database.	35%
6	Module III Raspberry Pi Interfacing	

	Communication facilities on raspberry Pi (I2C, SPI, UART, working with RPi, GPIO Library, Interfacing of Sensors and Actuators.	35%																				
7	<p>Pedagogy for Course Delivery: There will be two phases in the course:</p> <ul style="list-style-type: none"> • A tutorial portion on designing, simulation and interfacing of Electronics circuit. Teams of students will design their own prototype or circuit for a simple product of their choice, build simple prototypes of their design, and document their circuit design and simulation. To interface Raspberry Pi with different sensors to make a small project guest lectures will be invited to present a range of design challenges. Challenge areas will include consumer products and the needs of the developing world, sustainability, and other users of non-profit organization services. However, it will be the students that choose the topic of the product they wish to pursue. Students will form teams around the concepts they generate. Outside experts will be invited to review the simulation design and prototyping design. • A lab portion of the course will instruct students in design and prototype development of electronics hardware component in areas such as learning required software and hardware. 																					
	<p>List of Professional Skill Development Activities (PSDA):</p> <ol style="list-style-type: none"> 1. Study sensor interfaces and cloud communication 2. Study and use programmable boards 3. Develop sensor based projects and enable data storage in cloud <p>Assessment/ Examination Scheme:</p> <table border="1" data-bbox="226 1038 1494 1158"> <thead> <tr> <th>Theory L/T (%)</th> <th>Lab/Practical/Studio/SW (%)</th> <th>Total (%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> <td>100</td> </tr> </tbody> </table> <p>Lab/ Practical/ Studio/SW Assessment:</p> <table border="1" data-bbox="226 1270 1494 1492"> <thead> <tr> <th>Internal Components (Drop down)</th> <th>Presentation (P)</th> <th>Home Assignment (HA)</th> <th>Project (P)</th> <th>Report Writing (RR)</th> <th>Viva Voce (V)</th> <th>Attendance (A)</th> </tr> </thead> <tbody> <tr> <td>Linkage of PSDA with Internal Assessment</td> <td>PSDA 3</td> <td>PSDA 1</td> <td>PSDA1, PSDA2, PSDA 3</td> <td>PSDA 3</td> <td>PSDA 3</td> <td></td> </tr> </tbody> </table>	Theory L/T (%)	Lab/Practical/Studio/SW (%)	Total (%)	0	100	100	Internal Components (Drop down)	Presentation (P)	Home Assignment (HA)	Project (P)	Report Writing (RR)	Viva Voce (V)	Attendance (A)	Linkage of PSDA with Internal Assessment	PSDA 3	PSDA 1	PSDA1, PSDA2, PSDA 3	PSDA 3	PSDA 3		
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	Component, if any							
	Weightage (%)	10	10	40	20	15	5	

Mapping Continuous Evaluation with CLOs

Course Level Outcomes	CLO1	CLO2	CLO3
Assessment type			
Assessment Component 1	✓	✓	✓
Assessment Component 2	✓		
Assessment Component 3	✓	✓	✓
Assessment Component 4		✓	✓
Assessment Component 5		✓	✓

References:

1. The Internet of Things: From RFID to the Next-Generation Pervasive Networked Lu Yan, Yan Zhang, Laurence T. Yang, Huansheng Ning
2. Internet of Things (A Hands-on-Approach) , Vijay Madiseti , Arshdeep Bahga
3. Designing the Internet of Things, Adrian McEwen (Author), Hakim Cassimally
4. Asoke K Talukder and Roopa R Yavagal, "Mobile Computing," Tata McGraw Hill, 2010.
5. Computer Networks; By: Tanenbaum, Andrew S; Pearson Education Pte. Ltd., Delhi, 4th Edition
6. Designing The Internet of Things: Adrian Mcewen, Hakin Cassimally , Wiley- India, 2013
7. Data and Computer Communications; By: Stallings, William; Pearson Education Pte. Ltd., Delhi, 6th Edition
8. F. Adelstein and S.K.S. Gupta, "Fundamentals of Mobile and Pervasive Computing," McGraw Hill, 2009.
9. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010