BCSE311P	Sensors and Actuator Devices Lab	L	T	P	C
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Pre-requisite	**NIL**	**Syllabus version**			
		1.0			

Course Objectives

1. To create a conceptual understanding of the basic principles of sensors, actuators, and their operations
2. To analyze the real-world problems and provide solutions using sensors and actuators
3. To promote awareness regarding recent developments in the fields of sensors and actuators

Course Outcome

At the end of this course, student will be able to:

1. Classify different Sensors & Actuators based on various physical phenomena and learn various sensor calibration techniques
2. Select the relevant sensors and actuators to design real-time data acquisition from ambience via case studies

Indicative Experiments

1.	Hands-on with the Arduino Programming Environment (IDE) and the different Sensors and Actuators available with the Arduino Kit
2.	Design a data logger with different types of sensors and learn various sensor calibration techniques
3.	Design and implementation of B*reath analyzer* using temperature sensors
4.	Design and implementation of Liquid Level Indicator using optical Sensor**s**
5.	Design and implementation of odometer prototype to sense speed of an automobile
6.	Design and implementation of a prototype to monitor real-time tire-pressure
7.	Develop and validate a prototype for sensing PH and humidity parameters using polymer-based sensors
8.	Design and demonstrate a water quality monitoring system
9.	Demonstrate a simple parking system using ultrasonic sensors
	Total Laboratory Hours **30 hours**

Text Book(s)

1.	Volker Ziemann, "A Hands-On Course in Sensors Using the Arduino and Raspberry Pi", 2018, 1st Edition, CRC Press, United States.

Reference Books

1.	Inamuddin, Rajender Boddula, Abdullah M. Asiri, "Actuators and Their Applications: Fundamentals, Principles, Materials, and Emerging Technologies", 2020, 1st Edition, Wiley-Scrivener, United States.
2.	Peng Zhang, "Industrial Control Technology: A Handbook for Engineers and Researchers", 2008, 1st Edition, William Andrew Inc, United States.

Mode of Evaluation: CAT / Mid-Term Lab/ FAT

Recommended by Board of Studies	04-03-2022		
Approved by Academic Council	No. 65	Date	17-03-2022