TINKERING LABORATORY

Course code	23ES1551	Year	III	Semester	I
Course category	Skill Enhancement course	Branch	ME	Course Type	Lab
Credits	1.5	L-T-P	0-0-3	Prerequisites	-
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes		
Upon successful completion of the Robotics and Drone technologies Laboratory, students will be able to:		Blooms Level
CO1	Develop and analyze basic electronic circuits (series and parallel) using breadboards for real-time applications.	L3
CO2	Apply simulation and programming tools (Tinker cad, Arduino IDE) to build, test, and demonstrate microcontroller-based projects.	L4
CO3	Integrate and interface sensors and actuators (IR Sensor, Servo Motor, LDR) with Arduino and ESP32 for automation and smart control applications.	L4
CO4	Design and implement IoT-based solutions for remote monitoring and control using ESP32 and mobile applications.	L4
CO5	Create and fabricate mechanical components using 3D printing technology to develop working models and prototypes.	L4
CO6	Apply design thinking methodology to creatively solve problems and redesign existing products for improved functionality and user experience.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations(3-High,2:Medium, 1: Low)

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	2	2	1				1	1	1	3	3
CO2	3	3	3	2	3				2	2	2	3	3
CO3	3	3	3	2	3				2	2	2	3	3
CO4	3	3	3	3	3		2	2	2	2	3	3	3
CO5	2	2	2	2	3		1	1	2	2	2	3	3

Experiments	Details of Experiments	Mapped CO'S
E1	Make your own parallel and series circuits using breadboard for any application of your choice.	CO1
E2	Demonstrate a traffic light circuit using breadboard.	CO1
E3	Build and demonstrate automatic Street Light using LDR.	CO1
E4	Simulate the Arduino LED blinking activity in Tinker-cad.	CO2

E5	Build and demonstrate an Arduino LED blinking activity using Arduino IDE.	**CO2**
E6	Interfacing IR Sensor and Servo Motor with Arduino.	**CO3**
E7	Blink LED using ESP32.	**CO3**
E8	LDR Interfacing with ESP32.	**CO3**
E9	Control an LED using Mobile App.	**CO4**
E10	Design and 3D print a Walking Robot	**CO5**
E11	Design and 3D Print a Rocket.	**CO5**
E12	Build a live soil moisture monitoring project, and monitor soil moisture levels of a remote plan in your computer dashboard.	**CO4**
E13	Demonstrate all the steps in design thinking to redesign a motor bike.	**CO6**

Students need to refer to the following links:

1) https://aim.gov.in/pdf/equipment-manual-pdf.pdf
2) https://atl.aim.gov.in/ATL-Equipment-Manual/
3) https://aim.gov.in/pdf/Level-1.pdf
4) https://aim.gov.in/pdf/Level-2.pdf
5) https://aim.gov.in/pdf/Level-3.pdf
6) https://aim.gov.in/pdf/ATL_Drone_Module.pdf