

## TINKERING LABORATORY

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

Course Outcomes: Upon successful completion of the Robotics and Drone technologies Laboratory, students will be able to:

CO's	Statement:	Blooms Level	Experiments
<b>CO1</b>	Develop and analyze basic electronic circuits (series and parallel) using breadboards for real-time applications.	<b>L3</b>	<b>E<sub>1</sub> to E<sub>3</sub></b>
<b>CO2</b>	Apply simulation and programming tools (Tinker cad, Arduino IDE) to build, test, and demonstrate microcontroller-based projects.	<b>L4</b>	<b>E<sub>4</sub> to E<sub>5</sub></b>
<b>CO3</b>	Integrate and interface sensors and actuators (IR Sensor, Servo Motor, LDR) with Arduino and ESP32 for automation and smart control applications.	<b>L4</b>	<b>E<sub>6</sub> to E<sub>8</sub></b>
<b>CO4</b>	Design and implement IoT-based solutions for remote monitoring and control using ESP32 and mobile applications.	<b>L4</b>	<b>E<sub>9</sub> ,E<sub>12</sub></b>
<b>CO5</b>	Create and fabricate mechanical components using 3D printing technology to develop working models and prototypes.	<b>L4</b>	<b>E<sub>10</sub> to E<sub>11</sub></b>
<b>CO6</b>	Apply design thinking methodology to creatively solve problems and redesign existing products for improved functionality and user experience.	<b>L4</b>	<b>E<sub>13</sub></b>

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2: Medium, 1: Low)													
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
<b>CO1</b>	3	2	2	2	1				1	1	1	3	3
<b>CO2</b>	3	3	3	2	3				2	2	2	3	3
<b>CO3</b>	3	3	3	2	3				2	2	2	3	3
<b>CO4</b>	3	3	3	3	3		2	2	2	2	3	3	3
<b>CO5</b>	2	2	2	2	3		1	1	2	2	2	3	3
<b>CO6</b>	2	2	3	2	2	2	2	3	3	3	3	3	3

Experiments	<u>Details of Experiments</u>	Mapped CO'S
E1	Make your own parallel and series circuits using breadboard for any application of your choice.	C01
E2	Demonstrate a traffic light circuit using breadboard.	C01
E3	Build and demonstrate automatic Street Light using LDR.	C01
E4	Simulate the Arduino LED blinking activity in Tinkercad.	C02
E5	Build and demonstrate an Arduino LED blinking activity using Arduino IDE.	C02
E6	Interfacing IR Sensor and Servo Motor with Arduino.	C03
E7	Blink LED using ESP32.	C03
E8	LDR Interfacing with ESP32.	C03
E9	Control an LED using Mobile App.	C04
E10	Design and 3D print a Walking Robot	C05
E11	Design and 3D Print a Rocket.	C05
E12	Build a live soil moisture monitoring project, and monitor soil moisture levels of a remote plan in your computer dashboard.	C04
E13	Demonstrate all the steps in design thinking to redesign a motor bike.	C06

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](https://aim.gov.in/pdf/ATL_Drone_Module.pdf)