

MINI HUMANOID WORKSHOP SCHEDULE

INTRODUCTION TO MINI HUMANOID ROBOT:

By participating in this hands-on workshop, you will learn to build a two-legged robot or a biped walking robot which will have four degrees of freedom with a hip, knee & foot and mimic the walking action of humans.

By building this biped walking robot project, you will practically learn about Arduino architecture & its programming, working of the servo motors - which acts as actuators & the programming logic behind the human's walking action.

This program will also cover locomotion study of bi-peds, gait analysis, chassis and limb assembly, servo motor working principles, embedded systems, Arduino programming, system integration and robot testing. A mini humanoid robot geared for a secondary-school robotics curriculum. It introduces programming and other STEM concepts.

COURSE OUTCOMES

- Introduction to Servo Motors, Embedded systems & Microcontroller
- Introduction to design and development of Biped robot
- Understanding the Electronics circuit involved in Biped
- Understanding Arduino Architecture and its programming
- Programming of Biped according human's walking strategy

Days	Theory & Practice of Mini Humanoid Robot (BIPED ROBO)	Hours
Day1 Session1	<p>Introduction to Embedded Systems Basics of Embedded Electronics:</p> <ul style="list-style-type: none"> • Sensors • Operational amplifier • Integrating Circuit • Interfacing of Sensors • Motor and controlling circuits • Interfacing of Motors <p>Introduction to Microcontrollers</p> <p>session would deal with the basics of Microcontroller. The focus will be on microcontroller, which is one of the most powerful and widely used controller.</p> <ul style="list-style-type: none"> • What is microcontroller? • Difference between microprocessor and microcontroller • Microcontroller architecture and interfacing • How we can we use Microcontroller in our Own Circuits? 	2hours

<p>Day1 Session2</p>	<p>The Arduino Platform</p> <ul style="list-style-type: none"> • The Arduino Open-Microcontroller Platform • Arduino Basics • Arduino Board Layout &Architecture • Arduino Programming & Interface of Sensors • Interfacing sensors with Arduino Programming • Reading from Sensors <p>Project 1: Simple LED Program for Arduino</p> <p>Project 2: Integrating Sensors& Reading Environmental Physical Values.</p>	<p>2hours</p>
<p>Day 1 session 2</p>	<p>Project4: Traffic monitoring system</p> <p>Project5: Home automation</p> <ul style="list-style-type: none"> • Introduction to the Biped Robot • What is biped • What are the applications of humanoid Robots? • Why it is important to learn BIPED Robotics? • Explanation of different motors • Use of servo motor & pin configuration of the same 	<p>1 hour</p>
<p>Day2 Session1</p>	<ul style="list-style-type: none"> • Introduction to power supply board • Pin diagram explanation of Power supply board • Interfacing a servo motor to power supply board • Explanation of servo motor code <p>Project 6: Wiper system</p>	<p>2hours</p>

Day 2	<ul style="list-style-type: none"> • 90 degree lock programming. • Assembly of Robots. • Integrating Arduino with Robot. • Programming of robot for different applications. 	3hours																		
Day 2 Session 2:	Project 7: Walking Robot	1 hour																		
	Competition: After the theory and practical experience from the workshop, Competition will be conducted for the participants. Q & A, workshop evaluation, Certificate, distribution	1.30 hour																		
KIT CONTENT	<table border="1"> <thead> <tr> <th data-bbox="603 956 726 994">Name</th> <th data-bbox="726 956 858 994">Qty</th> </tr> </thead> <tbody> <tr> <td data-bbox="603 994 726 1070">Servo motors</td> <td data-bbox="726 994 858 1070">4</td> </tr> <tr> <td data-bbox="603 1070 726 1108">Arduino</td> <td data-bbox="726 1070 858 1108">1</td> </tr> <tr> <td data-bbox="603 1108 726 1187">Screw Driver</td> <td data-bbox="726 1108 858 1187">1</td> </tr> <tr> <td data-bbox="603 1187 726 1225">Battery</td> <td data-bbox="726 1187 858 1225">1</td> </tr> <tr> <td data-bbox="603 1225 726 1263">F to F</td> <td data-bbox="726 1225 858 1263">10</td> </tr> <tr> <td data-bbox="603 1263 726 1384">Biped Body Parts</td> <td data-bbox="726 1263 858 1384">all parts</td> </tr> <tr> <td data-bbox="603 1384 726 1422">PCB</td> <td data-bbox="726 1384 858 1422">1</td> </tr> <tr> <td data-bbox="603 1422 726 1500">1m Long cables</td> <td data-bbox="726 1422 858 1500">1</td> </tr> </tbody> </table>	Name	Qty	Servo motors	4	Arduino	1	Screw Driver	1	Battery	1	F to F	10	Biped Body Parts	all parts	PCB	1	1m Long cables	1	
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