



# NARNARAYAN SHASTRI INSTITUTE OF TECHNOLOGY

(Department of Electronics & Communication)

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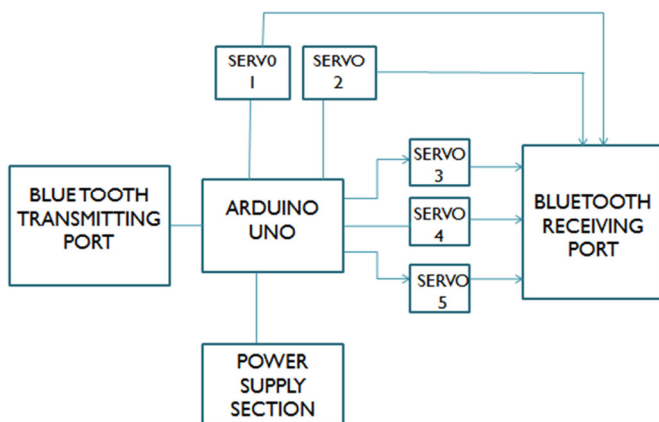
## Project Title:- 5 DEGREE OF FREEDOM USING SERVO SYSTEMS

### Abstract:-

This project involves designing and building a mobile robot capable of human-like behaviors. The basic function of 5 DOF is that, it rotates on three main axes i.e. X, Y & Z axis and it also rotates on X' & Y', will rotate in 5 different directions. 5 Degree of freedom satisfies that facilities like pick and place the things as well as industrial requirements. Human arm is considered to have seven degree of freedom, thus by implementing the use of robot will reduce human efforts and will do more work than human. 5 DOF Robotic Arm is a robotic arm with 4 degrees of freedom joints and a Gripper. It's actuated using 5 Standard size servos out of which 3 are normal Nylon gears standard and 2 are Metal Gear High Torque servo motors. This robotic arm is controlled by USB Servo Controller. It can be controlled by PC or other microcontrollers. The power requirement for this robotic arm is 5 to 6V 10 Amp DC power supply.

### Block /circuit Diagram:-

### BASIC BLOCK DIAGRAM



**Major Hardware components used:-** Arduino UNO, Servo Motors, SMPS, Bluetooth(HC-05), Body Mechanism.

### Software used:- Matlab GUI, Arduino coding

### Project Application:-

- (1) Mechanical: The robotic arm can have a variety of applications in mechanical field. It can be used for welding at high temperature environment usually dangerous for a human to work. It is used by many automobile industries for transport.
- (2) Medical: Robotic arm finds a number of applications in this field. They are useful in removing tumours and for performing cataract operations.
- (3) Space: Remote Manipulator System has robotic arms with many degrees of freedom used for performing inspections by cameras and sensors attached at the gripper end.
- (4) Household: can be accessed from a distance thus proving beneficial at household chores like cleaning

**Approx. Project Cost:- 18000/-**

### Project Photo:-

