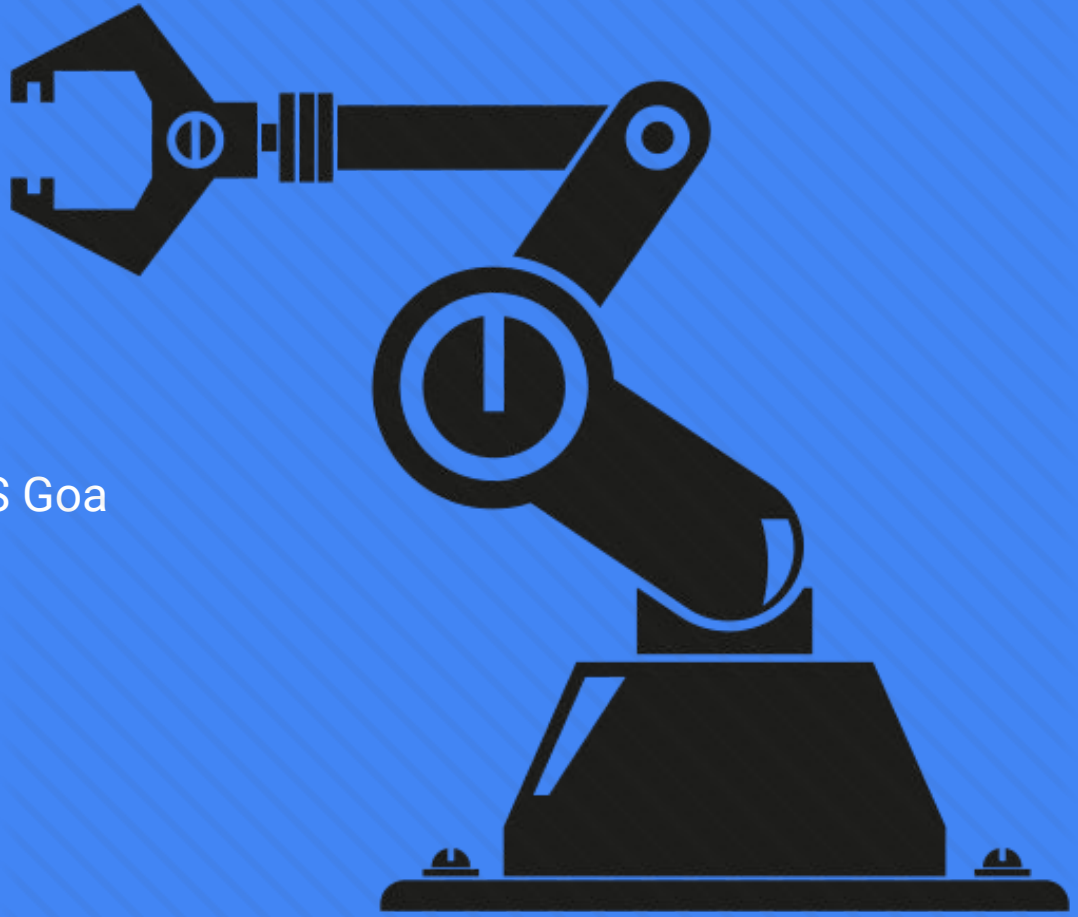
Introduction to Robotics



By Electronics & Robotics Club, BITS Goa

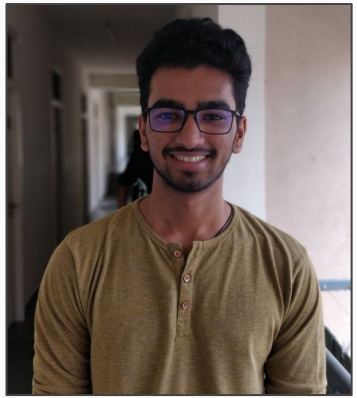
Overview

- Instructors and Mentors
- Course Timeline and Handout
- Lecture Hours
- Course Projects
- Breakdown of the Kit
- About Intermediate Robotics
- Contact Us

Instructors

Rishikesh Vanarse
(Sub Coordinator at ERC)

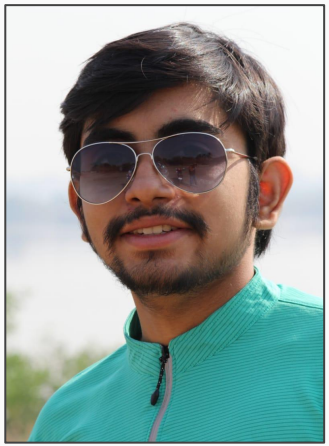
Harshal Deshpande
(ERC CTE Head)



Mohit Gupta
(Research Head of ERC)

Tejas Rane
(Chief Coordinator of ERC)

Mentors



Mohit Chaudhari
(Core Member of ERC)

Aditya Bidwai
(Core Member of ERC)

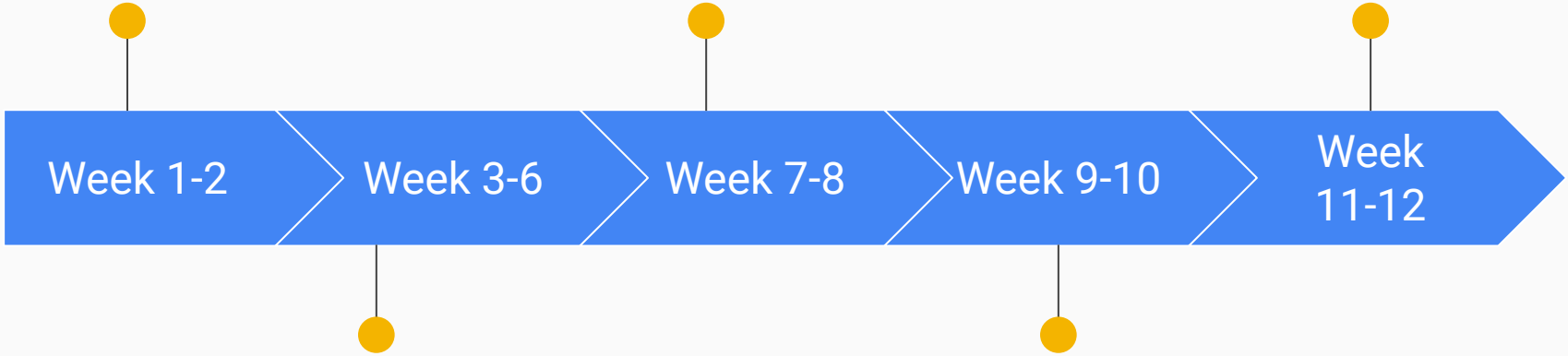
Advait Kulkarni
(Core Member of ERC)

COURSE TIMELINE

Understanding the basics of design a Robot

Control Systems and Electrical components

Open source robotics



Getting Started with Programming a microcontroller

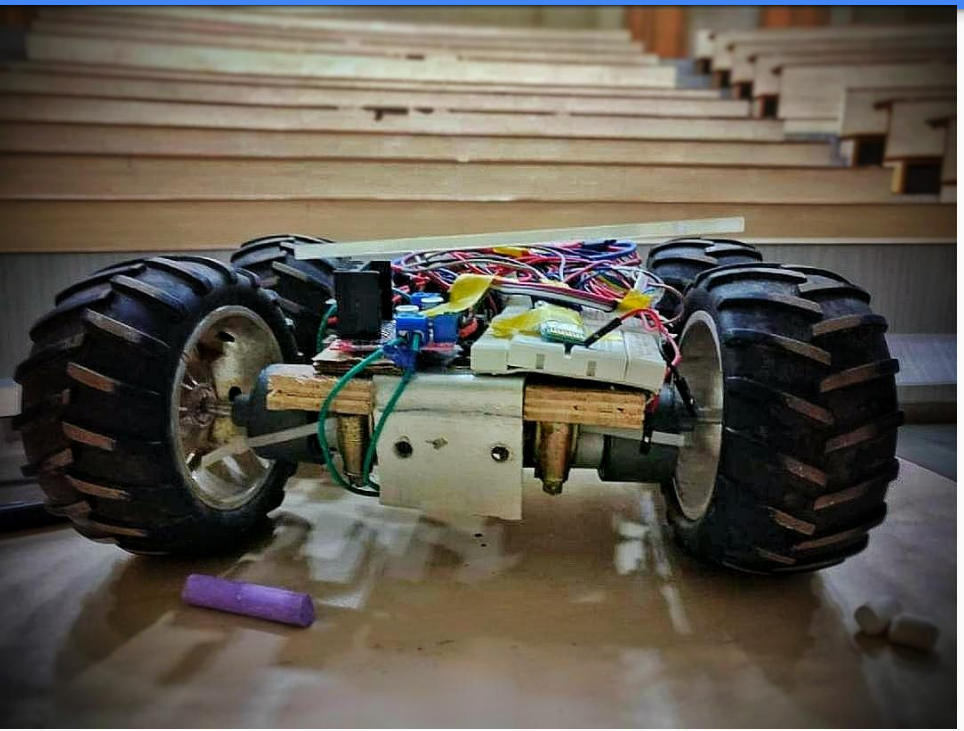
Robotic Manipulators

Handout:

Lecture	Learning Objective	Details
1-3	Introduction	We will be covering basic mechanisms in these lectures. We will also cover how to manufacture those mechanisms in industry and on-campus. Designing basics.
4	C Programming	We will be teaching C programming. We will cover basic syntax in this lecture.
5	Introduction to Arduino	We will introduce Arduino and Arduino ide and how C programming is used in Arduino. You'll also be introduced to ESP-32 and basic electric components.
6	*Implementation Session*	You'll be carrying out small tasks given during the lecture.
7-8	Arduino/ESP Contd.	During these lectures you'll get introduced to various sensors. You'll also do some small tasks.
9	*Implementation Session*	You'll be carrying out small tasks given during the lecture.
10	Advanced Microcontroller Concepts	In this lecture you'll be learning about the various communication protocols and interrupts.
11	Introduction to Control Systems	In this lecture you'll be introduced to control systems.

12	*Implementation Session*	You'll be carrying out small tasks given during the lecture.
13	Basic Electronics Components	In this lecture you'll be introduced to basic ICs like IC 741, LM317, timer IC 555, etc.
14	Robotic Manipulator	In this lecture you'll learn about kinematics of a robotic arm.
15	*Implementation Session*	You'll be carrying out small tasks given during the lecture.
16-17	MATLAB and Simulink	You'll learn how to use MATLAB and Simulink in these lectures
18-19	Introduction to Open Source Robotics	In these lectures you'll be introduced to python, version control systems, ROS (Robot Operating System).
20	*ENDGAME*	We will have a small competition in which everyone must display their projects and compete.

Lecture Hours

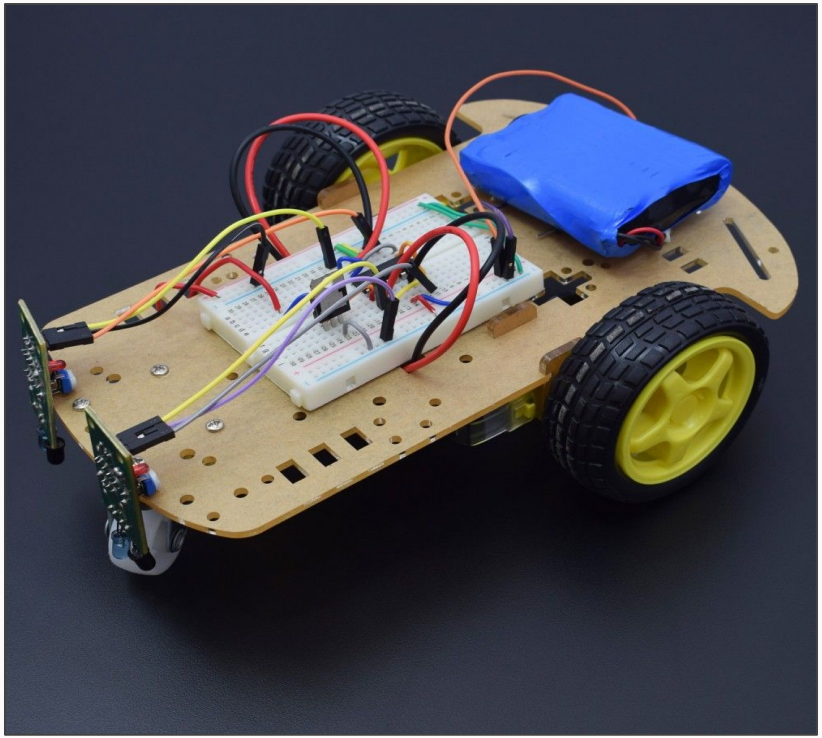


Number of Lectures per Week: **3**

Duration of each Lecture: **1hr 30min**

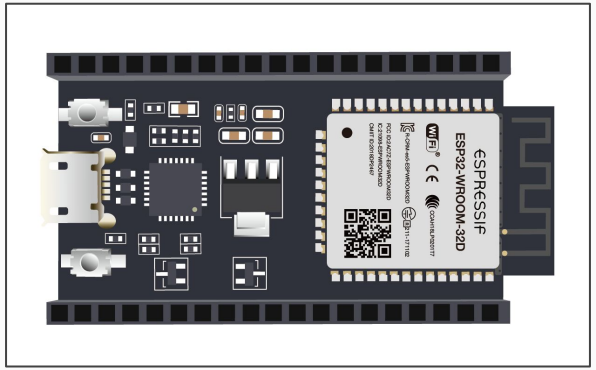
Course Projects:

Basic line Follower

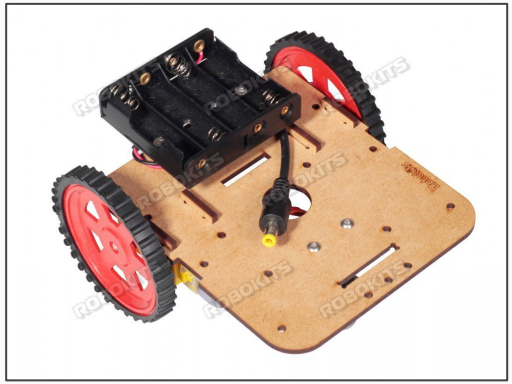


Robotic Arm

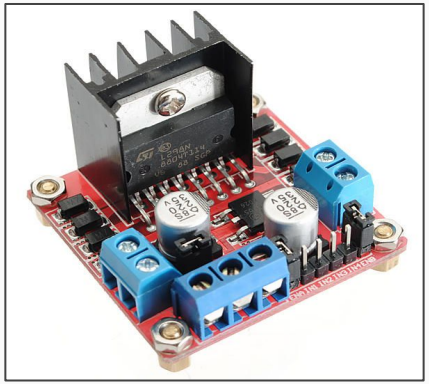
Components in the Kit:



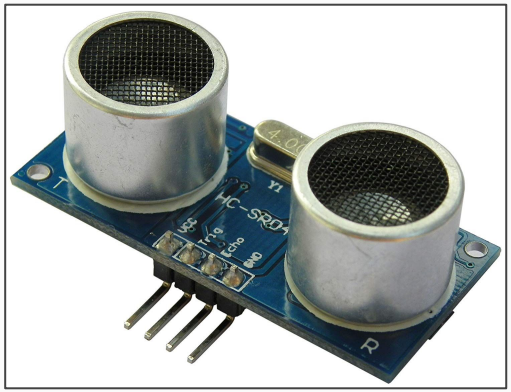
ESP32 Dev. Board



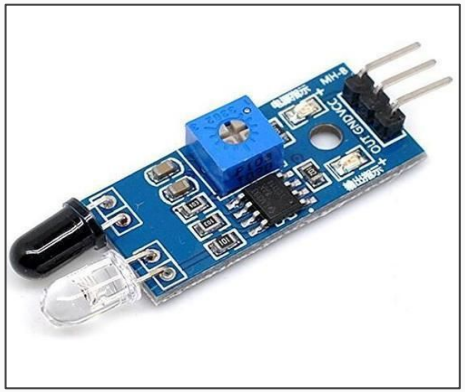
Robot Chassis



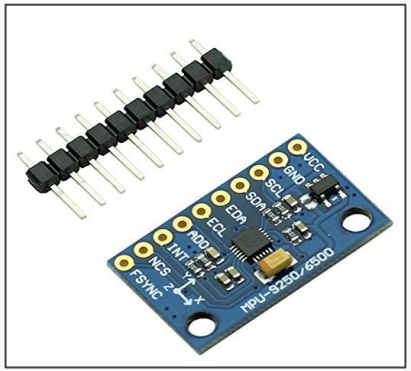
Motor Driver



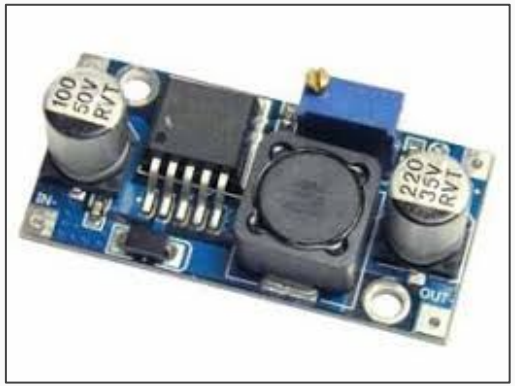
Ultrasonic Sensors



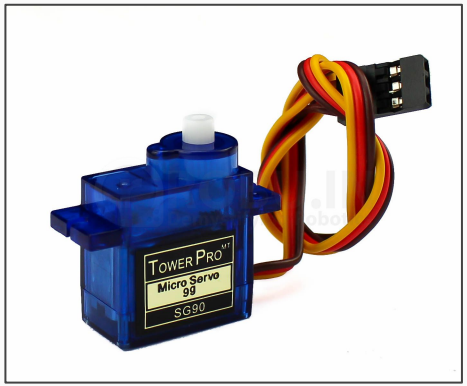
IR Sensors



Inertial Measurement Unit

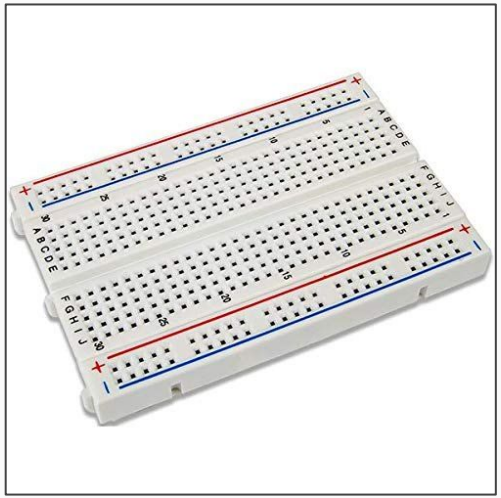


DC to DC Converter



Servo Motors

Battery and Charger



Mini Breadboard

Sr. No.	Name of the Component	Specifications / Model No	Quantity Per Kit
1	Robot Chassis Kit	Chassis size is 110 x 125 x 3mm. Made of Acrylic.The kit should include Screw, nut and spacers, 2 x Single Shaft BO Motors 300 RPM, 4 Kg cm 2 x Wheels Castor wheel Battery Holder 4X AA Cells	1
2	Motor Driver	L298N	1
3	IR Sensor	IR Obstacle Avoiding Sensor Based on LM393	2
4	Ultrasonic Sensor	HC-SR04	2
5	IMU	MPU9250	1
6	Lithuim Polymer Battery	2S 1000mAh 20C	1
7	Servo Motors	SG90	4
8	DC-DC Step Down Regulator	Specifications: LM2596 Based design with breakout board Input voltage: 3.2-40V Output Voltage: 1.5-35V (adjustable) ,input must least high 1.5V than output	1
9	Mini Bread Board		2
10	Lipo Charger	Imax B3 AC	1
11	Multi Strand Wires	1m 24 AWG	1
12	ESP-32	ESP-32 DevkitC	1

About Intermediate Robotics:

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https://erc-bpgc.github.io/Website/

Thank you!