CSE461

Introduction to Robotics

Summer 2025

Lab Outline

For Summer 2025, there will be a total of **8 lab sessions** designed to provide hands-on experience with robotics fundamentals using Arduino and Raspberry Pi. Each session will focus on essential components and techniques necessary for robotics projects.

Marks Distribution for Lab

Evaluation Criteria	Marks
Daily Evaluation - Lab Task (5) - Individual Quiz - 8 MCQ (2) - Report (2) - Attendance (1)	10
Lab Final - Task (3) - Individual Viva (2)	5
Project - Proper functionality of the robot (4) - Documentation / Report (3) - Creativity and design (2) - Presentation and demonstration (1)	10
Total	**25**

Note:

1. Any student found **guilty of plagiarism** during the quiz will receive a **0 in the respective task, quiz, and lab report**. Only attendance for that session will be recorded.
2. Maintaining a minimum of **90% attendance** is mandatory.

Lab Breakdown

Lab	Title	Content Covered	Deliverables	Tasks to be completed	Labsheet and Links
1	Course Intro & **Arduino**	- Lab overview - Marks distribution - Arduino basics - Pi OS installation guide	- Turn LED on/off using a switch	- Group formation - Provide lab report template - Bring USB pendrive with Pi OS installed in the next class	CSE461 La… CSE461 La… Setting up …
2	Introduction to **Raspberry P**i & Sonar	- Raspberry Pi basics - Sonar sensor	- Turn LED on/off using sonar	- Announce project, distribute guidelines - Provide project proposal template	CSE461 La… Project Proposal Template CSE461 La…
3	**Arduino & Raspberry Pi** Interfacing	- Interfacing Arduino and Raspberry Pi - Device communication setup	- LED control using interfacing		CSE461 La…
4	Sensor Integration	- IR sensor - LCD	- Display real-time sensor data on LCD	- Approve project ideas	CSE461 La… Black and White Zones
5	Servo Motor Control	- Servo motor explanation and usage	- Servo motor setup - Combine a sonar sensor with servo for a functional setup		CSE461 La…
6	DC Motor & Joystick Control	- DC motor basics - Joystick operation and usage	- Control DC motor using joystick and IR sensor inputs		CSE461 La…
7	Lab Final				
8	Project Demonstration				

Lab Timeline (Summer-25)

Saturday (Sec- 4, 6)	Sunday (Sec- 1, 8)	Monday (Sec- 7)	Tuesday (Sec- 2)	Wednesday (Sec- 5)	Thursday (Sec- 3)	Friday
28.06.25	29.06.25	30.06.25	1.07.25	2.07.25	3.07.25	4.07.25
Lab 1	Lab 1	Lab 1	Lab 1	Lab 1	Lab 1	
5.07.25	6.07.25	7.07.25	8.07.25	9.07.25	10.07.25	11.07.25
Lab 2		Lab 2	Lab 2	Lab 2	Lab 2	
12.07.25	13.07.25	14.07.25	15.07.25	16.07.25	17.07.25	18.07.25
Lab 3	Lab 2	Lab 3	Lab 3	Lab 3	Lab 3	
19.07.25	20.07.25	21.07.25	22.07.25	23.07.25	24.07.25	25.07.25
Lab 4	Lab 3	Lab 4	Lab 4	Lab 4	Lab 4	
MIDTERM EXAMINATION (26.07.25 - 3.08.25)						
2.08.25	3.08.25	4.08.25	5.08.25	6.08.25	7.08.25	8.08.25
		Lab 5	Lab 5	Lab 5	Lab 5	
9.08.25	10.08.25	11.08.25	12.08.25	13.08.25	14.08.25	15.08.25
Lab 5	Lab 4	Lab 6	Lab 6	Lab 6	Lab 6	
16.08.25	17.08.25	18.08.25	19.08.25	20.08.25	21.08.25	22.08.25
18.8.25 Lab 6	Lab 5		Lab Final	Lab Final	Lab Final	
23.08.25	24.08.25	25.08.25	26.08.25	27.08.25	28.08.25	29.08.25
Lab Final	Lab 6	Lab Final	Project	Project	Project	
30.08.25	31.08.25	1.09.25	2.09.25	3.09.25	4.09.25	5.09.25
Project	Final	Project	Extra	Extra	Extra	
6.09.25	7.09.25	8.09.25	9.09.25	10.09.25	11.09.25	12.09.25
Extra	Project	Extra	Extra	Sunday Extra	Extra	