

WRO Robot Development Roadmap

Overview

Goal: Build a Raspberry Pi-based autonomous robot for the World Robot Olympiad (WRO).

Time Estimate: 4-5 months with 10-15 hours/week.

Core Areas: Python, Raspberry Pi, Robotics, Computer Vision, WRO Practice.

Phase 1: Python & Linux Basics (2-3 weeks)

Learn Python programming (syntax, logic, OOP) and Linux terminal basics.

Courses:

- Python for Beginners - Learn Programming from Scratch
- Linux Command Line Basics

Phase 2: Raspberry Pi & Electronics (3-4 weeks)

Learn Raspberry Pi setup, GPIO control, and sensor/motor interfacing.

Courses:

- Raspberry Pi: Full Stack
- Introduction to Raspberry Pi 4 and Python

Phase 3: Robotics - Movement & Obstacle Avoidance (3-4 weeks)

Master motor control, sensor integration, and movement algorithms (PID, line following).

Courses:

- Build Your Own Robot Using Raspberry Pi
- Robotics for Beginners - Level 1

Phase 4: Computer Vision (4-5 weeks)

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Learn OpenCV for camera input, object tracking, and line/path detection.

Courses:

- Python for Computer Vision with OpenCV
- Raspberry Pi & OpenCV Robot Vision

Phase 5: Integration & WRO Practice (4-6 weeks)

Combine all systems. Practice WRO course runs and optimize performance.

Courses:

- Robotics: Learn by Building - Raspberry Pi & Arduino
- + Use WRO YouTube demos and GitHub for examples.

Hardware Checklist