Robotics Training Roadmap: From Zero to Autonomous Systems

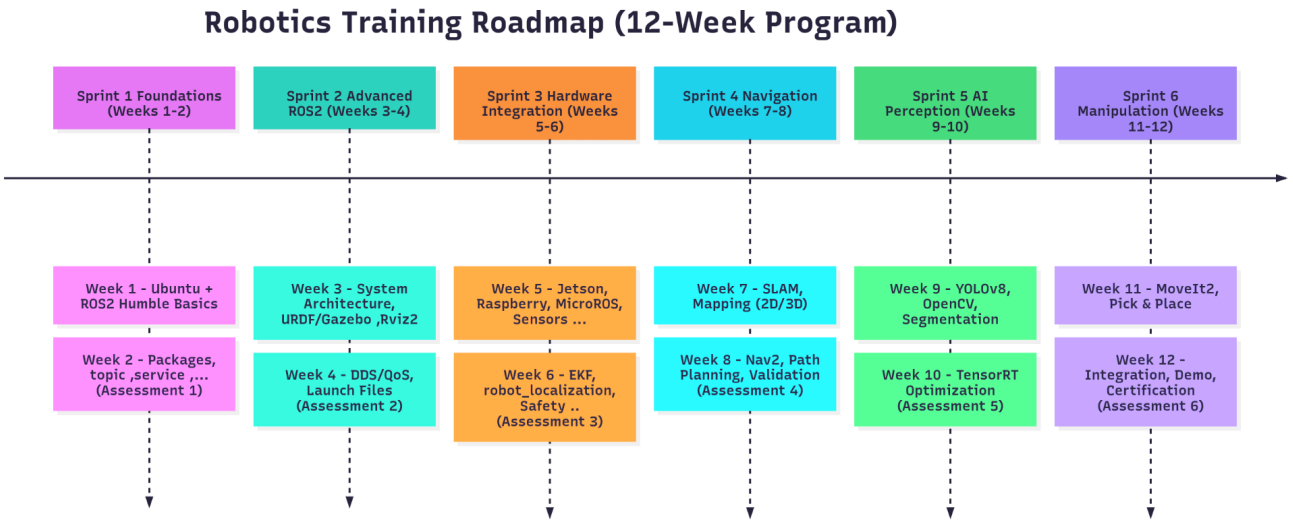
Welcome to the Robotics Training Roadmap ,your complete guide to progressing from absolute beginner to building fully autonomous robotic systems.

This roadmap is designed as a clear and structured journey that removes confusion and replaces it with real, practical skills. Whether you come with zero background or some experience, this path ensures you develop the right foundations before touching advanced robotics concepts like perception, navigation, and manipulation.

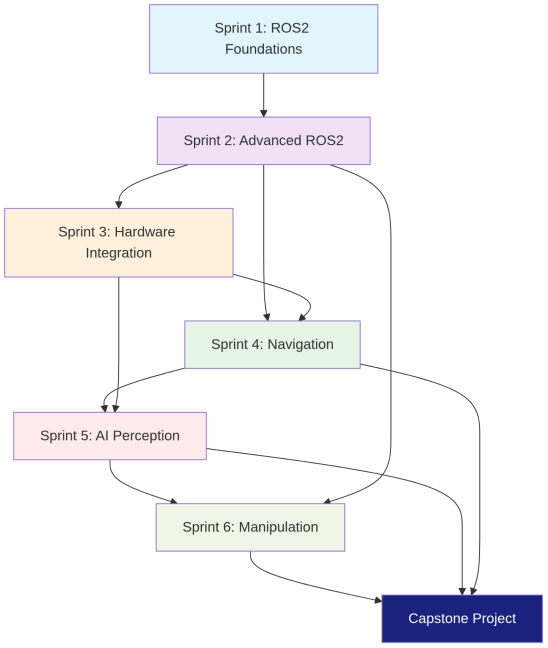
This training follows a learn-by-building philosophy: instead of long theory sessions, you'll quickly apply each concept through real ROS2 nodes, simulations, sensors, AI models, and autonomous navigation. Every phase builds directly on the previous one, ensuring a smooth transition from simple robot movements to full autonomous systems.

Your Learning Path Explained

Three Progressive Phases to Mastery



Learning Path Dependencies



PHASE 1 — Core Foundations (Weeks 1–4)

Students learn the fundamental tools of robotics — Linux, ROS2 middleware, simulation environments, and the basics of robotic communication.
This phase answers: **How do robots talk, think, and simulate?**

PHASE 2 — Hardware & Perception (Weeks 5–10)

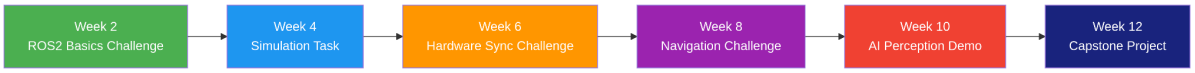
After mastering software, students begin interacting with the physical world using sensors (LiDAR, IMU, cameras), embedded boards like Jetson Nano or ESP32, and AI perception models.
This phase answers: **How do robots see, feel, and understand their environment?**

PHASE 3 — Autonomy & Integration (Weeks 11–12)

Students integrate everything they learned into advanced systems like Nav2, MoveIt2, SLAM Toolbox, Zenoh, and multi-robot architectures.
This phase answers: **How do robots navigate, plan, and make decisions autonomously?**

By the end, you will be able to build end-to-end systems:
Simulation → Perception → Localization → Navigation → Autonomy.

Assessment & Milestone Map



What Makes This Different?

Traditional Learning:

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Lecture → Theory → some practice
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Our Approach:

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Quick concept → Immediate practice → Build something →Understand deeply →Repeat
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What You'll Achieve

By the End of This Program, You Will:

- Speak the language of robotics (ROS2) confidently.
- Build and program real robotic systems from scratch.
- Make robots see, navigate, and interact with their environment.
- Have a professional portfolio of robotics projects.
- Understand the complete robotics stack from sensors to AI.
- Be prepared for robotics engineering roles in industry.