

REC Unit 1 for Cortex: Introduction to Robotics

Catalog No.	8105-0010
Category	Mobile Robotics
Duration	15 Hours
Software Supplied	easyC5

REC Unit 1: Introduction to Robotics

Welcome to REC

(Core): Introduction to Robotics

What is a Robot?

Robotic Applications

Robot System Components

Section 1.1 Review

1.2 (Core): The Design Cycle

The Design Cycle

The Importance of Iterations

Section 1.2 Review

1.3 (Activity): Engineering Notebook

Engineering Notebook Guidelines

Setting up Your Notebook

Making Your First Entry

Questions

1.4 (Core): Safety

What do I protect?

Personal Safety Rules

Equipment Safety Rules

Safety Glasses

Robotic Assemblies

Classroom Safety

Safety Rules Reference

Section 1.4 Review

1.5 (Core): The VEX Robot

- Inventory Control
- Structural Components
- Motion Components
- Power Components
- Sensor Components
- Control Components
- Programming Components
- Tools
- Section 1.5 Review

1.6 (Activity): Vex Components

- Classroom Inventory System
- Identifying Vex Components
- Engineering Notebook

1.7 (Core): Fasteners

- What is a Fastener?
- Anatomy of a Screw
- Assembly Tools
- Section 1.7 Review

1.8 (Activity): Chassis Construction

- Safety
- Assembly Techniques
- Using LearnMate Assembly Procedures
- Assembling the BaseBot Chassis
- Engineering Notebook

1.9 (Core): Drive Train

- Motors
- Gears
- Wheels
- Bearings
- Shafts and Collars
- Bringing it All Together
- Section 1.9 Review

1.10 (Activity): Drive Train Construction

- Gear Alignment Techniques
- Assembling the BaseBot Drive Train
- Engineering Notebook

1.11 (Core): Robot Controller

- Vex Controller
- Power Supply
- Battery Maintenance
- Mounting the Battery
- Electrical Connections
- Section 1.11 Review

1.12 (Activity): Wiring the Vex Controller and Battery

- Mounting the Controller and Battery Shelf
- Installing the Battery
- Connecting the Motors to the Controller
- Engineering Notebook

1.13 (Core): Radio Control

Radio Control

Radio Signals

What is Frequency?

Frequency Channels

Transmitter

Receiver

Antennas

Tether Port

Section 1.13 Review

1.14 (Activity): Using Radio Control

Mounting the Receiver Module

Installing the Frequency Crystals

Installing the Transmitter Battery

BaseBot Testing

Transmitter Range

Transmitter Settings

Adjusting the Trim

Resetting the Transmitter

Engineering Notebook

1.15 (Core): Dual Joystick Control (Tank)

Robot Control

Default Code

Tank Control

Section 1.15 Review

1.16 (Activity): Tank Control

Configuring Tank Control

Driving the Robot in a Straight Line

Mastering Tank Control

Engineering Notebook

1.17 (Core): Single Joystick Control (Arcade)

- Arcade Control
- Jumper Clips
- Arcade Default Code Settings
- Section 1.17 Review

1.18 (Activity): Arcade Control Operation

- (Activity): Arcade Control - Fundamental
- Configuring Arcade Control
- Driving the Robot in a Straight Line
- Mastering Arcade Control
- Engineering Notebook
- Arcade Activity Conclusion
- (Activity): Arcade Control - Advanced
- Driving the Robot in a Straight Line
- Navigating Obstacles in Arcade Control
- Engineering Notebook

1.19 (Core): Robot Systems Design

- Stability
- Designing Robotic Subsystems
- Materials Usage
- Section 1.19 Review

1.20 (Activity): Adding Components to the BaseBot

(Activity): Adding Components to the Basebot - Fundamental

Mounting the Marker

Drawing a Straight Line

Tank vs. Arcade Control

Drawing Shapes

Engineering Notebook

Adding Components Activity Conclusion

(Activity): Adding Components to the BaseBot - Advanced

Mounting the Marker

Drawing a Straight Line

Tank vs. Arcade Control

Drawing Shapes

Engineering Notebook

1.21 (Project): Motion Path Challenge

(Project): Motion Path Challenge - Fundamental

(Project): Motion Path Challenge - Advanced

Unit 1 Conclusion