

MARS ROVER LAB

Autonomous Self-Driving Mars Rover

MCK-MRLB-001



MINDS-i STEM INTEGRATED ROBOTICS: AUTONOMOUS SELF-DRIVING MARS ROVER

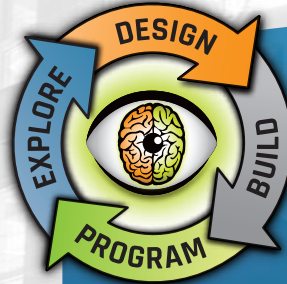
Take STEM learning to new heights with this cutting edge GPS-IMU powered rover. Students explore programming, electromechanical systems, and autonomous navigation. Students design, build, and program the rover for ground-based missions, environmental exploration, autonomous obstacle avoidance, and other compelling space related challenges.

SPARK AND SUSTAIN STUDENTS' INTEREST IN STEM

MINDS-i Robotics engages students in an energizing STEM learning environment with easy to build, program, and modify robots. Technologically advanced rovers and drones perform impressive real-world tasks that build excitement for STEM careers. The curriculum encourages collaborative problem-solving and the open-source Arduino® C++ programming language fosters endless creativity. With outstanding technical support, teachers are empowered and students are inspired to build whatever they envision in their "mind's eye."

I COURSE DESIGN

This lab is a half semester (45 Hours) and designed for 2-4 students.



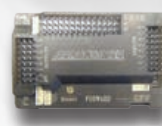
GPS & COMPASS



ENCODER



DASHBOARD



CONTROLLER



RC CONTROL

FIND YOUR MINDS-i SALES REPRESENTATIVE AT:

mindsieducation.com »

info@my minds i.com »

CURRICULUM OUTLINE - 45 HOURS

Unit 1: Introduction to Autonomous Vehicles

1. Student Performance
2. What is an Autonomous Vehicle

Unit 2: Mars Rover Autonomous Vehicles

1. Space Exploration
2. Mars Exploration
3. Parts & Purposes
4. Mars Rover Chassis Build

Unit 3: Autonomous Vehicle Technologies

1. Testing the Micro-Controller
2. Parts & Purposes
3. Core Syntax Overview
4. Surface Mapping of Mars
5. Martian Autonomous Navigation
 - 5.1 Earth Based GPS Navigation
6. IMU Heading
7. Autonomous Vehicle Build
8. Power Level Monitoring
9. Communications

Unit 4: Electrical Engineering & Energy Transfer

1. Energy Types & Transfer
2. Electric Motors
3. Volts, Amps & Watts
4. Batteries

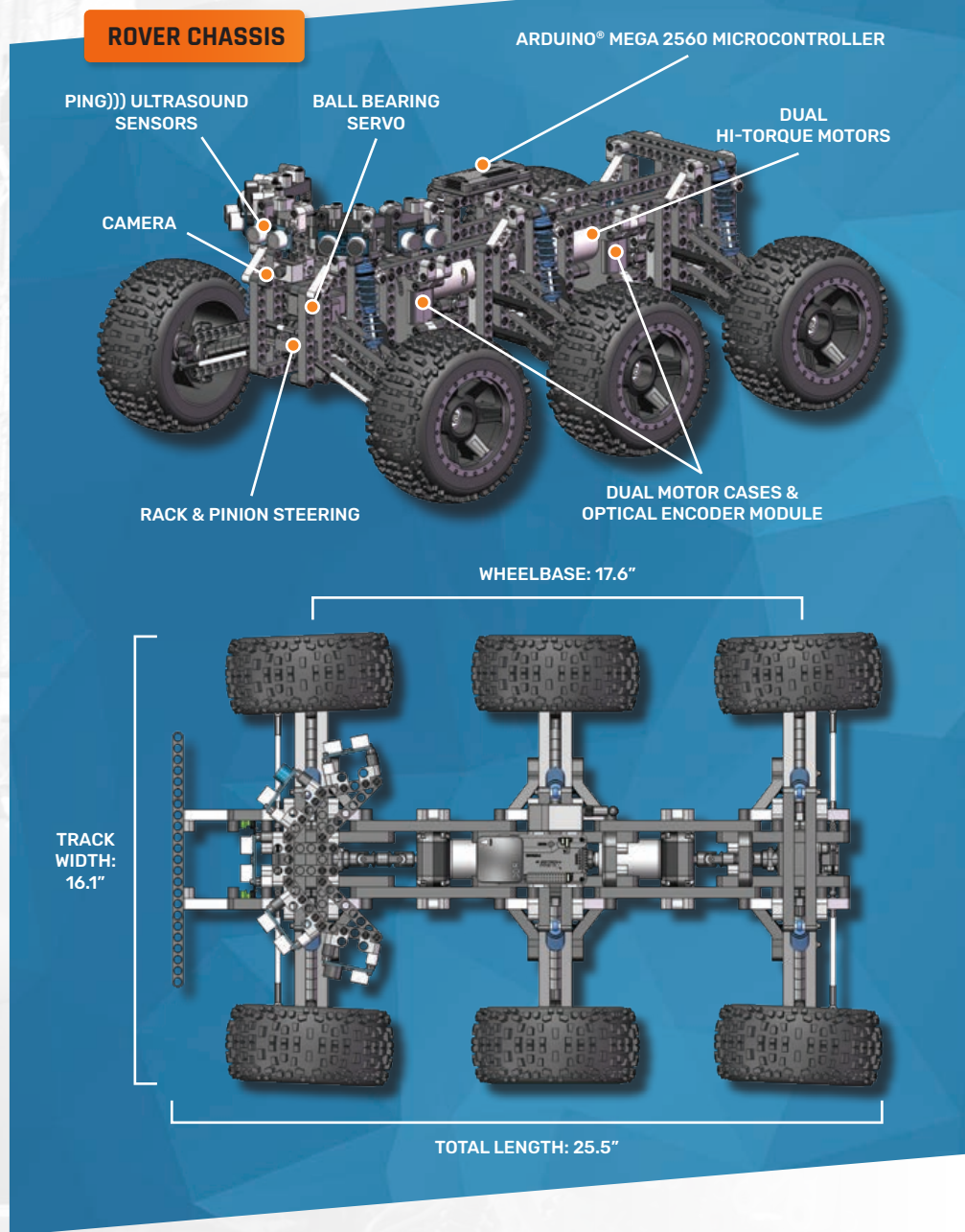
Unit 5: Applied Systems Thinking

1. Earth Based Autonomous Navigation
2. Inputs, Outputs and Constraints
3. Interrelationship Diagrams

Unit 6: Culminating Project

1. Search for Life
2. Obstacle Avoidance
3. Autonomous Navigation

INCLUDES A CAMERA FOR FIRST-PERSON VIEW



I MINDS-i DASHBOARD SOFTWARE & MEGA 2560 HARDWARE

- » Open Source Software / Windows 10, OS X & Linux Ready, Easy to use Graphical Interface
- » Drag and Drop Installation (w/Radio Driver)
- » Save and Load GPS Paths, Capable of Navigating to 100 Waypoints
- » Live Location Tracking and Wirelessly Adjust Settings
- » Customizable Graphs: Latitude, Longitude, Yaw/Direction, Pitch, Roll, Ground Speed, Voltage, Amperage and Altitude
- » Full Telemetry Logging and Inclinometer Gauges

