

ROBOTICS OUTREACH PROJECT



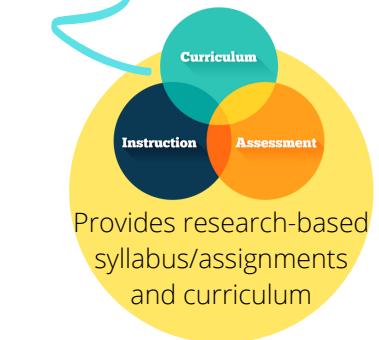
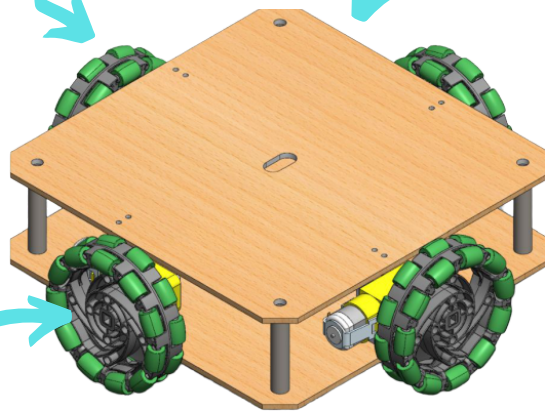
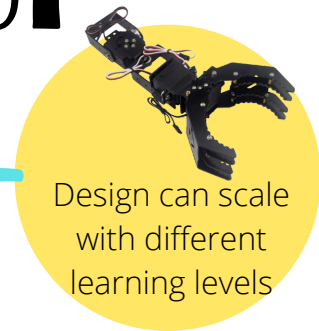
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The goal of this project is to successfully design and build a robot to introduce students typically underrepresented in STEM to engineering.

To achieve this goal, we will construct a robotics kit that incorporates many introductory level features and an evidence-based curriculum that a middle/high schooler will be able to safely construct with assistance.

To facilitate funding for future outreach projects, the team will research materials to minimize cost without compromising the safety of potential users.

MEET OUR ROBOT



PROMOTES LEARNING

This project uses active learning and team work techniques from current literature in engineering education. A syllabus, curriculum, and instruction manual for instructors will be provided to ensure that the kit requires no master of robotics to complete, and that students are provided a learner-centered experience!

ECONOMICALLY EFFICIENT

This project addresses the needs of low-income schools that cannot typically afford to provide STEM-related resources like robotics competitions, coding courses, 3D-printing, and/or machine shops.

By minimizing cost, our project can facilitate funding for outreach programs to promote students' interest in engineering and computer science.

PROMOTES DIVERSITY

This project will promote diversity in STEM by providing robotics project for students that are typically underrepresented in STEM.

By making a curriculum that is open source and accessible for non-robotics instructors, outreach programs can be implemented with greater ease. Furthermore, the curriculum will provide techniques to address issues commonly faced by underrepresented students in STEM (e.g., stereotype threat).

WHY WE NEED THIS SOLUTION

1 in 3 U.S. Adults would like to see a greater emphasis on K-12 STEM education

(Pew Research Center)

The education system neglect students' needs due to **poor administration of resources**

(Darling-Hammond, L.)



Current educational coding and robotics kits range from:

\$150-\$600+



Research shows that students develop stereotype threat as early as the **2nd grade**, which creates **under-performance** in certain contexts, and grows into adolescence.

(Cvencek et al., 2011)

Current prototype cost

\$155

(can be brought down if bought in bulk)

THE FUTURE OF OUR ROBOT

1

Create a PCB to increase the safety of the kit

3

Code on the bluetooth blink app controller

5

Test kits with outreach and/or after-school programs

2

Create arm claw to provide more rigor and pique interest in Engineering

4

Create a more detailed teaching curriculum for novices in coding and wiring