

Problem: The current computing curricula for the first two years is mostly comprised of foundation courses in mathematics and introductory computing courses that **lack of** the characteristics of real world applications, hands-on projects and teamwork.

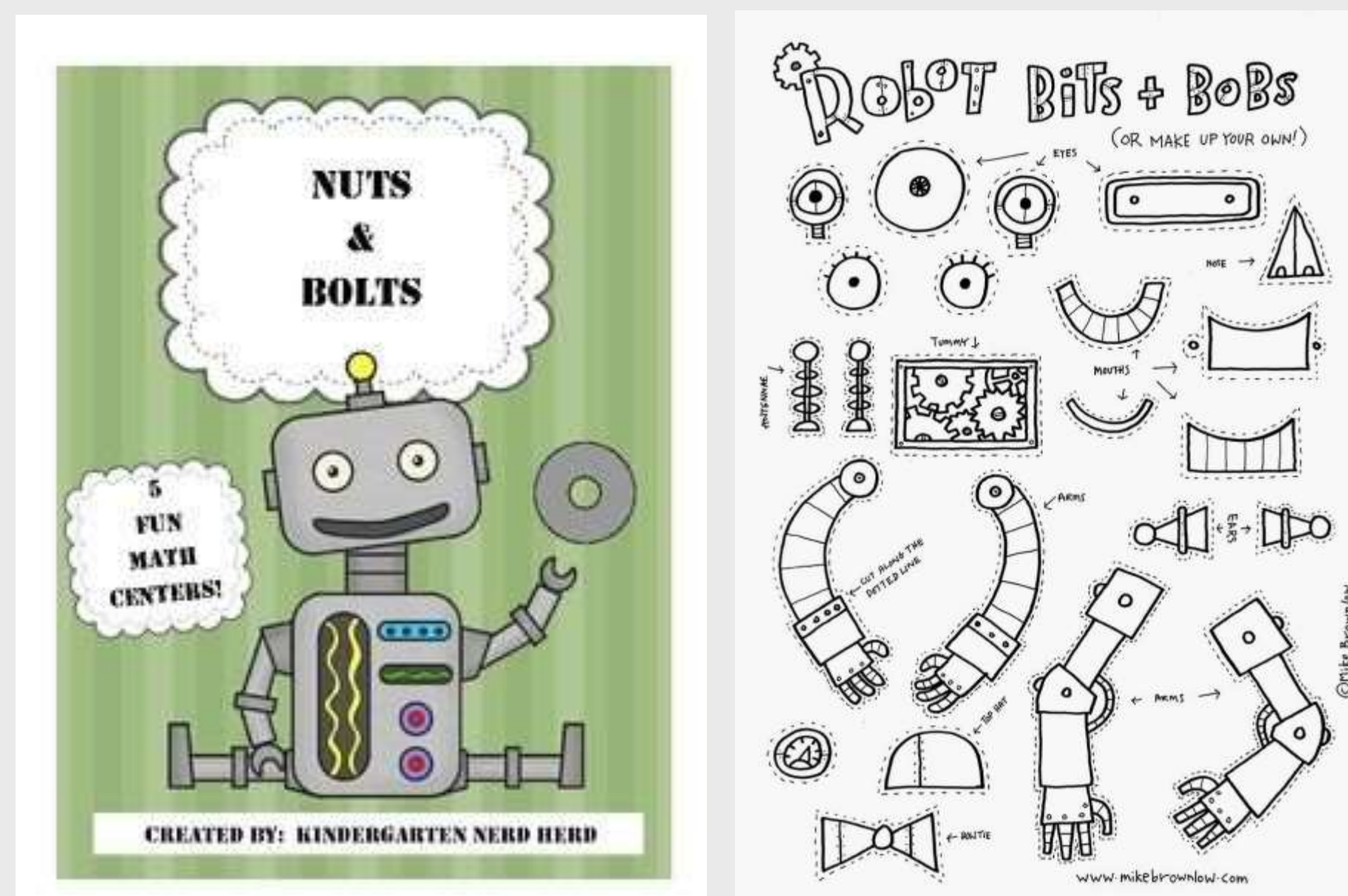
Solution: We present our robotics-based solution that incorporates tangible projects and team learning in computing curricula to promote recruitment and retention. The primary component of our robotics based solution is a series of robotics oriented courses.

Three courses have been developed or being developed in a sequence.



The First Course:
FYEX 102: Robots-Bits and Bolts

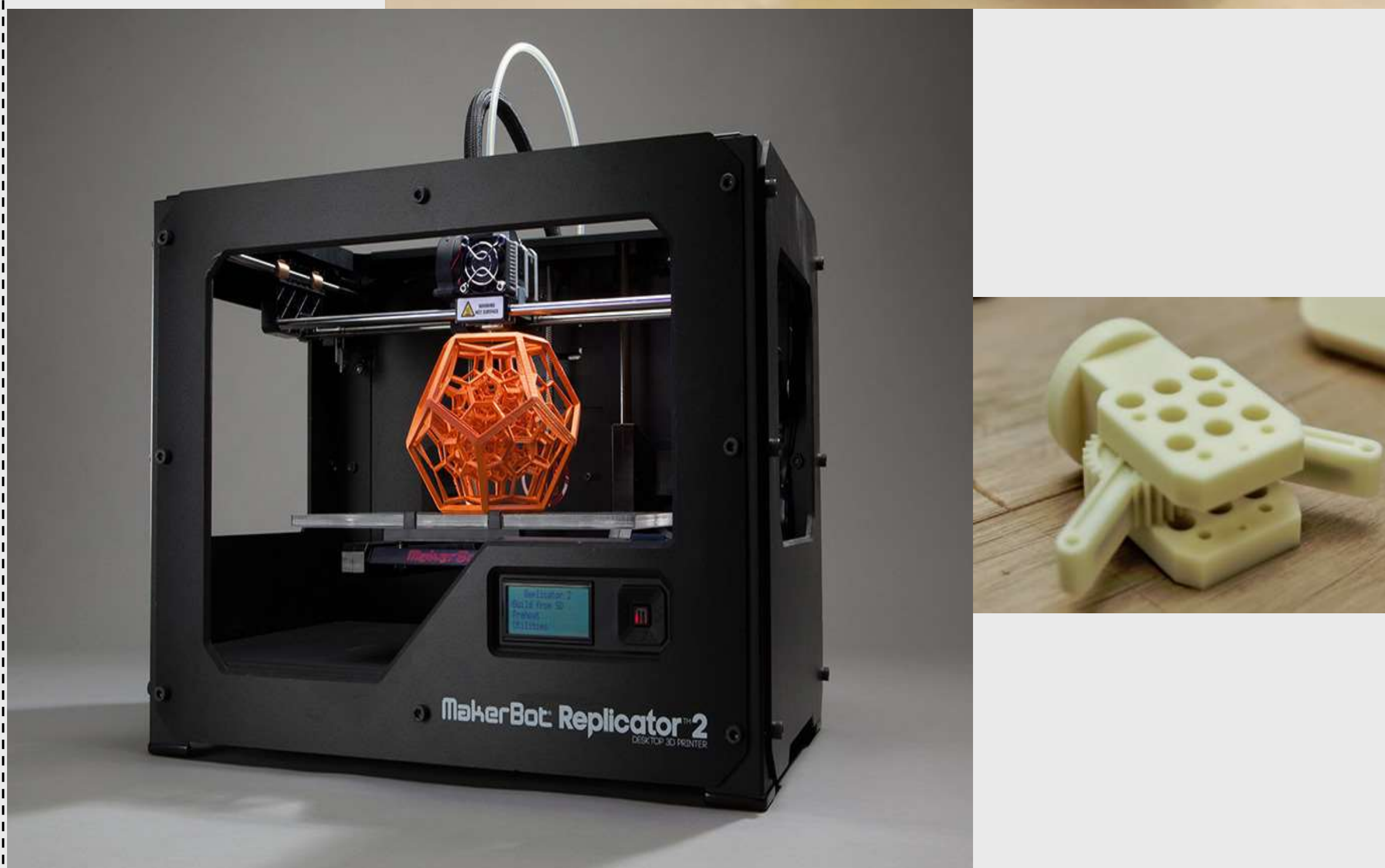
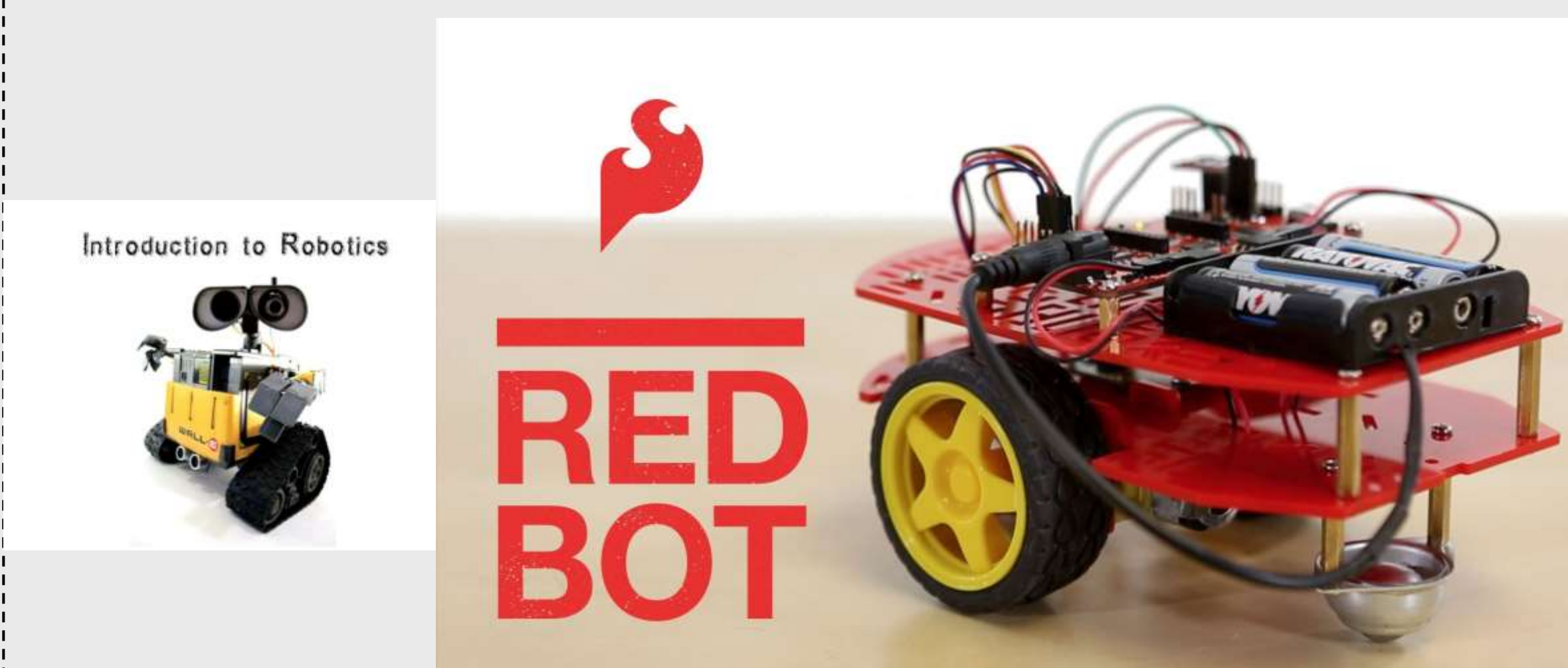
This is a first year experience. Students in this class will learn about robots and how to build simple robots.



The Second Course:
ENGR 300: Intro to Robotics

The ENGR 300 will be a project and team-based course that includes the active participation of two students as peer educators. This course will include a lab component using Robot SparkFun RedBot Kit, a robotic development platform capable of teaching two motor robotics and sensor integration.

Students will learn about the basics of modeling, design, planning, control and programming prior to building a simple robot. The design project is first modeled by implementing 3D drawing software (Autodesk Inventor) and replicating that in 3D printer.



The Third Course:
ENGR 350: Robotics Seminar

The one credit seminar, ENGR 350 is a seminar course that will provide an opportunity for students to work in teams on robotics projects. At the end of the semester each team will demonstrate their robotics projects in a competition format, at ShepRoboFest or other events.



ShepRoboFest

Conclusion

Our robotics based approach motivates students to study a variety of computing concepts and gain knowledge and skills in hardware, software and communication networks such as sensors, sensor networks, robotics APIs, and programming.

Students also get chance to explore how computing knowledge and skills can be utilized in practical robotics projects and applications, and learn the importance of teamwork and communication.

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