

# AFRL NEW MEXICO STEM OUTREACH

## ROBOTICS CHALLENGE

The Robotics Challenge Mission, for middle school students, is a school-based program in which students explore systems engineering, computer science and robotics by learning to build and program small robots to complete tasks and solve problems.

Teachers and students are provided with online training and materials related to robotics and computer science. AFRL NM STEM Outreach provides teachers with materials they can use to explore and apply computer science and engineering concepts with their students over the course of the school year.

Students are introduced to the concept of a system and see how a computer is a system. The students learn to think like a computer, in binary, using only ones and zeros and try their hand at some binary math. They then discover how to use a computer to talk to the microcontroller using computer programming languages.

Teams create solutions to a variety of challenges through computer programming and building robots that use a variety of hardware and electrical components.



Student teams complete a series of online assignments to earn points toward qualification for the Robotics Challenge Expo. The culminating Expo event is held in the spring at our facility on Kirtland Air Force Base for the top 30 point earning teams. At the Expo, student teams demonstrate and share creative applications of their skills and knowledge and complete programming challenges.

The Robotics Challenge is a great opportunity to actively involve your students in innovative applications of science, technology, engineering, and math (STEM) concepts.



## **YOU PROVIDE THE STUDENTS, THE ENTHUSIASM, AND THE EXPERTISE, AND MAKE THE FOLLOWING COMMITMENTS:**

- ◆ Complete and submit the Coach Registration (link found at [afrlnm.com/stem/missions/robotics-challenge/](http://afrlnm.com/stem/missions/robotics-challenge/)).
- ◆ Attend the Robotics Challenge Coach Orientation.
- ◆ Ensure that your school submits an EPA Modification Form.
- ◆ Recruit and create student teams for the Robotics Challenge.
- ◆ Complete and submit an Inventory Form (link will be provided).
- ◆ Ensure that your teams have access to computers for programming.
- ◆ Provide guidance and advice as your teams work through the units building and programming their robots.
- ◆ Ensure that teams meet assignment requirements (including file sizes) BEFORE submitting assignments.
- ◆ Ensure that all survey information is returned by students, parents, and coaches.

If one or more of your teams qualifies for the Robotics Challenge Expo:

- Submit requested information for the Robotics Challenge Expo by specified deadlines.
- Arrange transportation for you and your students to attend the Robotics Challenge Expo.
- Attend the Robotics Challenge Expo with your students.

If you have questions or need additional information, please contact us at:

**(505) 846-2677**

**OR**

**[robotics@afrlnewmexico.com](mailto:robotics@afrlnewmexico.com)**

**OR**

**Visit us on the web at:**

**[afrlnm.com/STEM/missions](http://afrlnm.com/STEM/missions)**

