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[2013](#)

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[2010](#)

[2009](#)

[2008](#)

[2007](#)

[2006](#)

[2005](#)

[2004](#)

[2003](#)



Picatinny mentors prepare students for robotics competition

Jason Kaneshiro
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A student receives guidance on the operation of machining equipment.

Scientists and engineers at Picatinny Arsenal have volunteered their time to mentor local students in a robotics competition as part of an ongoing effort to promote science, technology, engineering and mathematics education to students.

The FIRST Robotics competition is scheduled for March 23-24 at Mount Olive and will have 13 teams sponsored by members of the Picatinny Arsenal community. The acronym FIRST means "For Inspiration and Recognition of Science and Technology."

The Department of Defense established the Science, Technology, Engineering and Math (STEM) initiative in an effort to ensure a leadership position in economic growth and technological supremacy.

FIRST was established in 1989 by Dean Kamen, who is best known for having invented the portable dialysis machine, the Segway and recently the Luke prosthetic arm. Since its establishment the "game" has changed from year to year and the number of teams has continued to grow.

"Every year it gets bigger and bigger. Now there are more than 2,500 teams with more than 51,000 students involved," said Charlie Patel, Chief Engineer with Product Manager Excalibur, a part of the Program Executive Office for Ammunition at Picatinny.

"We've been sponsoring teams for four years now," said Shahram Dabiri, STEM technology manager with the Defense Ordnance Technology Office (DOTC).

The teams receive the parameters of the game and all of the rules at the same time via YouTube.

They have only six weeks to design, build, test and field a functional robot. Adding complexity to the challenge the robots do not come in "kit form" nor are any instructions provided.

Instead, by using parts available through FIRST and ones the students fabricate themselves, a robot must be built and tested to not only compete against other robots, but also to meet critical physical and safety parameters.

Three years ago, the DOTC-STEM office started with four teams. One team, #3142 from Newton, N.J., made it to finals in Atlanta Ga., in its rookie year.

The DOTC-STEM support has expanded to 13 local teams. Each team is provided a sponsorship to help fund the team and, more importantly, continued technical assistance through a professional mentor.

Mentors keep students focused and keep their projects within designated parameters, as well as ensure that safety remains a top priority at every stage.

With the growth of the number of locally supported teams, an Integrated Product Team was formed to establish communication among various Picatinny supported teams. "Teams share together," Patel said. "They share parts and knowledge because there's no way they can succeed on their own."

Unlike other sponsors, Picatinny mentors provide a continuous link between the engineers and the students.

Students participating in the competition gain more than just learning engineering principles as they bring their projects from concept to reality.

"They learn project management, presentation skills, engineering, and safety procedures," said James O'Malley, an engineer with the Armament Research, Development and Engineering Center.

One of the most positive comments that the engineers received from the students was that they were truly helpful to students.

Dabiri recalled students who said that other non-Picatinny sponsors would rarely check on them, while other sponsors wouldn't let the students do anything and would complete the project for them.

"We've been told that some other mentors only stop once in a while and others wouldn't let the students touch any of the machine tools needed to fabricate parts for the robot," said O'Malley.

The students are not the only ones who benefit from the competition. "It helps me as an engineer because we have to be able to explain these concepts to a 17-year-old," said O'Malley.

By learning to communicate sometimes complicated engineering principles to the students, O'Malley added, it helps him to be a better communicator with other Picatinny personnel who do not have an engineering background.

"If we can explain these things to students, we can explain to it anyone," Dabiri elaborated.

The local FIRST robotics event on March 23-24 will be at Mt. Olive High School in Flanders, N.J., (18 Corey Rd, Mt Olive Township, N.J., between Routes 206 and 46) where teams will compete in a robotic game of Frisbee golf/football. No tickets are needed.

"I encourage everyone at Picatinny to come to the event," Dabiri said. "It's free and there's never a down moment. It's like going to a NASCAR race where everyone gets front row seats and access to the pits!"

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