A Senior Year Like No Other

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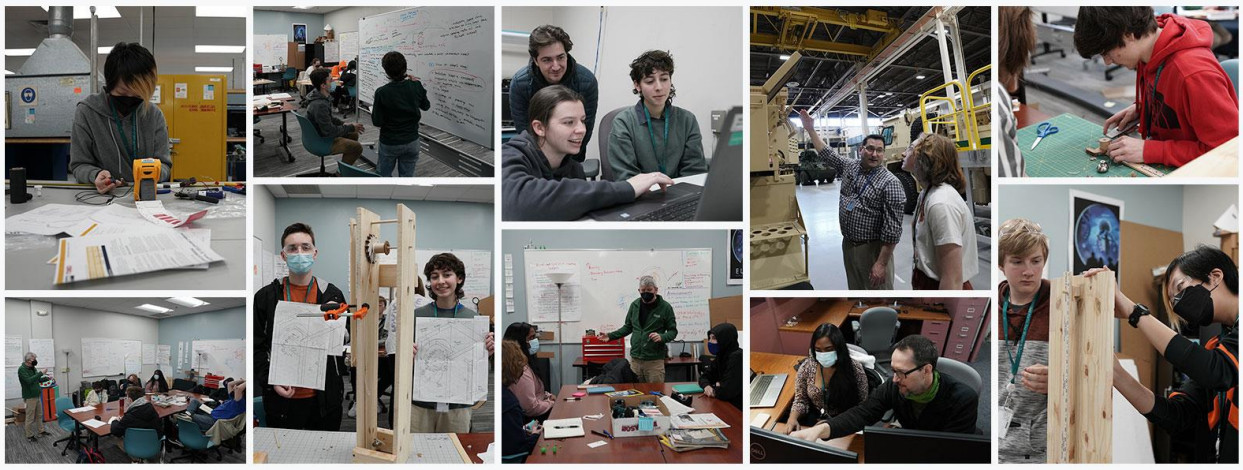

A supporting bracket on the external cooling unit for the new Sentinel multi-mission radar needed to be designed. The program team assigned the project – to a high school student.

"I did a 3-D drawing on the computer to present my solution," Autumn Brown, a senior at a local Syracuse, N.Y., area high school, said. "It's incredible to actually see it being used now on the actual radar."

Autumn is one of 16 students in the New Vision Engineering Program. A partnership between Lockheed Martin RMS in Syracuse and the region's BOCES program. New Vision Engineering is a selective one-year program intended for high school seniors who have expressed a strong interest in STEM. Students are on site at Lockheed Martin for half a school day with the 16 students split into morning and afternoon sessions.

(L to r) A New Vision Engineering student meets with a Lockheed Martin engineer; the class works on its pendulum project.

"It's a college preparatory program that takes college-bound high school seniors that are going into engineering and builds both their interpersonal and technical skills to help them make that transition to college and set them up for success their freshman year and throughout college," Dr. Mark Povinelli, the students' New Vision Engineering teacher, said. "Everything they do in the program is experiential and gives them a window into their future."

In addition to classroom work focusing on engineering processes, the students spend up to six hours a week working side-by-side with Lockheed Martin engineers. "They get hands-on exposure with real engineers and see the dynamics, details and relationships required to be an engineer," said Povinelli. "They learn that engineering is a team profession, not one person working in alone."

"We're assigned to an engineer for each of our three rotations during the year," said Jack Mohat, another student in the program. "My first was with a mechanical engineer, now I'm working with an electrical engineer. And through them we meet their manager and teammates and work through our assigned project."

Jack is working now to create a diagram of a radar antenna subsystem, something he said the program team has been wanting to do for a while but could not find the time to do so.

(L to r) Students tend to their projects; Jack Mohat (left) and Autumn Brown (right) work with New Vision Engineering teacher Dr. Mark Povinelli.

Systems Engineering Associate Manager Paul Fioramonti serves as the New Vision Engineering program manager for Lockheed Martin and works with the Syracuse engineers and their managers to coordinate student assignments.

"I find the early career engineers gain a great deal from this experience as well," Paul said. "They have a lot in common with this age group, so they relate to the students on a different level, and it helps them learn how to delegate and manage the tasking. And older engineers who often have kids older than the students can offer even a different perspective on what to expect from college and can provide career-path advice."

The students also work on projects in class. For their most recent endeavor, students formed teams to design, build and test pendulum clocks. "The first step was designing the clock, then doing the drawings to understand the principles behind what we were building, and now we're building it," Jack said.

Jack has been part of a FIRST Robotics club since he was in first grade and his interest in engineering has never wavered. He has already been accepted by the Rochester Institute of Technology (RIT) and Clarkson and he wants to study mechanical engineering.

Autumn Brown will be attending RIT in the fall majoring in aerospace engineering. "It's definitely a unique experience, especially as a high schooler, to be in the workplace learning new skills and that includes communication skills. We're taking what we're learning in the classroom and immediately applying it to real-work situations."

"This has given me such an insight into engineering as a whole," added Jack.

"These are high school students getting tremendous exposure, so for them to have this opportunity at this stage really sets them up for success in college and beyond," Povinelli said. "New Vision Engineering teaches them a holistic design process and that requires a lot of trans-disciplinary knowledge. The program emphasizes students taking their experiences, reflecting on them, thinking abstractly about them, and putting them into action. It's a cycle."

The year-long course is set up to further students' engineering interest, something Autumn clearly subscribes to. "Even the everyday little things make me say, 'Wow, this is what I want to do.' It's nice to have that feeling."

Note: The photos in this article were taken over several weeks; photo sessions included both when site mask requirements were in effect and when mask use was optional.

More about New Vision Engineering

The program is in its third year at the Syracuse site. The 2019-2020 class finished the year remotely due the pandemic and the 2020-2021 New Vision session was entirely remote. Despite those hurdles, students were able to continue with their engineering rotations. Students have been able to be on site during this latest school year.

The students' Friday class is a college-level English class the first half of the year that serves as a prerequisite for a technical writing class they take the second half of the year. Both are college credit-eligible courses.

Several students from the first two years of the program have gone on to work as summer interns at the Syracuse site.