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3D Technology Brings Hope to Student

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CEDARVILLE, OHIO -- Mallory Waayenberg likes to stay in shape. But when you're born without a right forearm or hand, going to the gym becomes a difficult proposition. However, four Cedarville University mechanical engineering students are designing an attachment for her prosthetic arm that will allow Waayenberg to perform weight-bearing exercises with both of her arms.

"I don't like going to gym now; no one wants to feel more uncomfortable going to the gym than they already do," said Waayenberg, a junior psychology major from Grand Rapids, Michigan. "Because of this project, I'll be able to work out my arms and back."

The four mechanical engineering students designing the attachment are seniors Austin Land of Juneau, Alaska; Richard Mathias of Centerville, Ohio; Tyler VanDerMolen of New Hampton, New York; and Aaron Waller of Gray, Tennessee.

The students are using 3D modeling computer-aided design called Solid Works, 3D finite element analysis and 3D printing technology. The students plan to eventually market this device, in its current or modified version, so that others will benefit.

The project is currently in the early stages of design. The engineers will build multiple prototypes that Waayenberg will test for their effectiveness in meeting all of the project specifications, such as gripping, staying attached and supporting the weight she lifts.

The weight-bearing attachment is the capstone project for the group's bachelor's degrees. The project proposal has taken place, and the students are in the process of preliminary designs and approvals. The students will have two prototypes to compare before the end of the fall semester. Their goal is to complete the attachment by the beginning of May 2019. The estimated cost is $435, funded by the school of engineering and Waayenberg.

"Because of my exposure to para-sports, I recognize that adaptive equipment can result in exceptional enhancements to sports participation and performance," commented Dr. Tim Norman, distinguished professor of mechanical and biomedical engineering. "This project contains key elements in our capstone design series but has the added feature of being customer driven."

“Engineers, especially those from Cedarville University, want to help people by using their knowledge and skills,” Norman added. “They are driven to alleviate suffering in the world and are satisfied from seeing their work make a difference in someone’s life, especially when that someone is a fellow Cedarville student.”

Waayenberg has been inspired and encouraged as well. “This project proves how dedicated Cedarville faculty and students are to use their God-given ability to help me and others like me,” she said. “This project is such an awesome opportunity to show our dedication to research, innovation and helping others.”

Located in southwest Ohio, Cedarville University is an accredited, Christ-centered, Baptist institution with an enrollment of 4,193 undergraduate, graduate, and online students in more than 150 areas of study. Founded in 1887, Cedarville is recognized nationally for its authentic Christian community, rigorous academic programs, strong graduation and retention rates, accredited professional and health science offerings, and leading student satisfaction ratings. For more information about the University, visit www.cedarville.edu.