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11/02/2015

Side-by-Side Cycle Helps Opportunities Roll

Nov. 2, 2015 — Jay Lindstrom's love for biking and Laura Birkhold's enthusiasm for a hands-on project made designing a side-by-side quadricycle perfect for their senior design project. Along with their team members and representatives from Common Ground Outdoor Adventures and Icon Health & Fitness, the group of mechanical engineering students set out to build a unique tandem cycle they dubbed 'Tandemonium.'



Common Ground provides outdoor activities for persons with disabilities. Tandemonium was built to provide a safe and enjoyable riding experience for their clients. Icon Health & Fitness helped fund the project and offered expert mentoring and manufacturing support along the way.

In designing the bike, students chose four main goals to implement: safety, accessibility, durability and portability. Safety aspects included turning radius, braking distance and visibility. The team wanted Tandemonium to be easily accessible for all body types and to be strong enough to ensure durability. In addition, it needed to be lightweight enough to make it easy to transport.

"It was so easy to get tunnel vision and just design your part," said Birkhold, adding that even when there were problems throughout the project, she enjoyed working with her team members. "Everyone brought different experience and expertise to the table, without which we wouldn't have been able to build the bike."



Tandemonium taught the senior design team how to effectively communicate, work together and overcome problems, an invaluable experience for their future careers. They learned how to work together even when difficult challenges came up.

“My favorite part was seeing it all come together in the end,” added Birkhold. “For so long the bike was just a model on a computer screen or a list of parts we had to source. Seeing it actually in front of me and getting to ride it was the most rewarding experience of the whole project.”

Lindstrom said the project taught him the importance of a thorough design process.

“I was surprised by the number of iterations required to get the final design down,” he said. “With a minor change in one system, it could change the requirements for another system. It was kind of a balancing act.”

The Tandemonium team is working with advisors Rees Fulmer and Dixon Nielson to finalize the cycle and deliver it to Common Ground.