

Tech Corner

Fred Bauer – Council Rock High School South

Fred Bauer is an exceptional Council Rock teacher who gives an extraordinary amount of expertise, time, and dedication to students both in and out of the classroom. To describe Fred Bauer as a Technology Education Teacher does not do him justice.

Under Mr. Bauer's mentorship, CR Students are given many opportunities to explore and grow. One rare and coveted example comes via the Zero Robotics project that partners with Massachusetts Institute of Technology (MIT) and the National Aeronautics and Space Administration (NASA). In this project, students program simulations in "C" language to control satellites aboard the International Space Station (ISS) to perform a task assigned by MIT. This is a competition against teams from all over the world, and in the finals the codes are uploaded to ISS to perform in zero gravity. In 2013, Council Rock Placed 2nd, and this year placed 23rd out of ~173 teams (<http://zerorobotics.mit.edu/>).

Mr. Bauer arrives at South five days a week two hours before school starts and stays until 9:00 or 10:00 p.m. He is often in the classrooms on weekends and spends most of his summer at South working on projects, maintaining and repairing equipment, and planning out the next school year.

Although many students believe Mr. Bauer "lives at South," he resides in the Hatboro area with his wife. They have two young adult sons. He is a 1982 graduate of Penn State University with a degree in Industrial Arts Education. Throughout his teaching career, Mr. Bauer has completed many graduate classes from several universities. As a lifelong student, the advanced courses that he takes focus more on practical content that he believes will "directly add value to teaching students."

Mr. Bauer teaches six different classes this year: Engineering and Robotics, Honors Engineering and Robotics, Independent Study in Engineering and Robotics, Graphic Arts, Advanced Graphic Arts, and Independent Study in Graphic Arts.

In addition to being a classroom teacher, Mr. Bauer is the Department Coordinator for Technology Education at South, the faculty advisor of the Technology and the Graphic Arts Clubs, the class advisor for the Class of 2017, advisor for the NASA HUNCH (High school students United with NASA to Create Hardware) team, NASA/MIT Zero Robotics team, NASA/CELERE team and the Technical Director for South's Golden Wings Theatre Company.

The Technology Club's goal is to increase students' understanding of modern technology through discussion, demonstration and experience. Members of the Technology Club are divided into three teams according to their skills and interest: a research and design team, a web design team, and a marketing team. The Technology Club is the corporate umbrella for CR Rock Rovers, HUNCH, and various projects that give back to the community, such as designing and printing t-shirts for charity events, providing signs for Special Olympics, and giving time to the CR Science Night and presentations about NASA for elementary schools.

In 2012, CR Rock Rovers designed a ROV (Remotely Operated Vehicle) to be used in a zero gravity environment that would inspect the outside of the space vehicle while the astronauts remain inside. The following year, students designed ROV 2 for use on the International Space Station (ISS) or on the flight to the ISS, and NASA invited Fred Bauer and a team of four other teachers, Jerry Fetter, Jeff Warmkessel, Joe Warwick and Tom Hegedus, to the Johnson Space Center in Houston to test the ROV on a zero gravity flight that is also known as "the Vomit Comet." Teachers communicated with the

students via webcast. Also in 2012-13, the CR South team was accepted to the NASA/HUNCH Microgravity Program. The approval allowed students to prepare for their own zero gravity flight.

HUNCH gives students and educators the opportunity to design, fabricate, fly and evaluate reduced gravity technology over a course of four to six months (<https://www.nasahunch.com/>). The selected teams work with NASA mentors to carry out scientific research, hands-on investigational design and test operations.

In 2013-14, South students designed a self-contained, compact experiment that analyzed the effects of microgravity on the capillary action of fluids. South's team, led by Mr. Bauer, was one of only 16 schools selected from applicants across the country to design and test their HUNCH experiment aboard NASA's reduced gravity aircraft. Based on their resume and work ethic, four South students (two to fly and two as ground crew) were chosen to go to Houston. Their test and flight were fantastic, and the students had an experience they will never forget. More people have been to the top of Mount Everest than have experienced zero gravity free float; these students in Mr. Bauer's program have earned that honor.

During this school year, South students are building an incubator designed to survive in the zero gravity environment of the space station and test the development of life in that environment. In past years, sponsorships and donations, including a grant from the Council Rock Education Foundation (CREF), funded students involved in the HUNCH project that represented Council Rock South in Houston. Mr. Bauer does not believe that students should have to pay their own way. As of this writing, the HUNCH team, which lost Lockheed Martin as a major sponsor, is short of the financial goal needed to send six students to Houston, so they are still looking for sponsors. To find out more about the project and sponsorship, the marketing team can be contacted at <http://www.crzeroq.org>.

Graphic Arts Club is another organization supervised by Mr. Bauer. Citizens interviewed Mr. Bauer in his graphic arts room, where students design and transfer their creations onto a number of different mediums. They include printed publications, tickets for events, stationery, vinyl signage, and various apparel. Mr. Bauer's students not only hone their design skills and learn how to screen-print clothing; they also grasp valuable lessons regarding business management. The students make shirts for many school events, such as the senior trip, Blue, White and Gold Night, and Golden Wing's productions, to name a few. They also design shirts for the benefit of community charity events such as Breast Cancer Awareness and Juvenile Diabetes.

As the Golden Wings Technical Director, Mr. Bauer and his students have provided many special effects for theatrical productions. For example, he and his crew engineered real rain in *Singing in the Rain*, they fabricated a flying car for *Chitty Chitty Bang Bang*, and they had a real chandelier come crashing down for *Phantom of the Opera*. Also, astute and observant theatre goers may spot Mr. Bauer incognito as he often appears in cameo roles.

Mr. Bauer is making a difference in student's lives in many ways. Many of his former students focus their college studies in math, science or aeronautical engineering, leading them on to successful careers. Former students and club members often stay in touch. Some Technology Club alumni have proverbially paid it forward by giving donations to benefit current students. One former CR South HUNCH team member (Kat Johnston) is currently mentoring students on an Indian reservation in Washington State to help them develop their own HUNCH team, and will be flying with CR in Houston this year.

Citizens for Education is proud to honor Mr. Bauer as the first person from either high school to be featured in "Tech Corner." We thank him for his dedication to his South students, and for his time offered to both North and South students who are part of the Technology Club.