

STEM MAGNET-IC NEWS

A quarterly newsletter brought to you by Bloomsburg University

VOL. 1, ISSUE 1

FALL 2014

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Director's Corner



Welcome to the first edition of Bloomsburg University's **STEM Magnet-ic News**; the only e-newsletter with news from the STEM Magnet program and information about the STEM field. In this newsletter you will find information about who is involved with the STEM Magnet program, what exciting things the students in the program are doing, upcoming events, available resources, and information on the STEM field.

The brainchild of [Bloomsburg Area School District](#), [Central Columbia Area School District](#), [Berwick Area School District](#), and [Bloomsburg University](#), the STEM Magnet program began in Fall 2013 with its first cohort of juniors from these three school districts. During that year, the program offered an engineering track to 19 students. This fall we have seen an expansion to the program with 23 new juniors, including students from two new school districts ([Danville Area School District](#) and [Columbia-Montour Area Vocational-Technical School](#)), plus an additional track in health sciences.

The growth of the program has created new ideas and opportunities to encourage these students to pursue careers in the science, technology, engineering, and mathematical fields. The program is under the direction of Dr. Elizabeth Mauch, dean of the college of education with the cooperation from the dean and faculty of the college of science and technology. In addition, this year a director of the STEM Education Center has been added allowing the program to grow with more activities. Check out "Student News" on page four to learn about these.

If you have questions or would like to learn more about the STEM Magnet program, feel free to contact us at kbolig@bloomu.edu or by calling (570) 389-4608.

Did You Know?



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Everyone is talking about the STEM (science, technology, engineering, and math) field, but do you know why? Learn the facts about why our nation is focusing on the need for more individuals to go into STEM careers.

Featured Employer:



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The STEM Magnet program is very fortunate to have leaders in the industry partner with it to provide real world experience and guidance. This edition's feature employer is Kawneer Alcoa in Bloomsburg, PA.

Student News:



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The STEM Magnet students have now been in the program for two months. Find out what they have been doing during this time.

STEM Education Center

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Did You Know?



Have you noticed that STEM is mentioned everywhere these days? You can find it on the news, in political campaigns, and even in television ads. Take for example Exxon Mobil's current "Why be an Engineer?" television commercial that asks, "Want to change the world?" Exxon Mobil has been at the forefront of promoting STEM through its support for the National Math and Science Initiative (NMSI). NMSI was created to address the need to improve America's competitiveness by significantly improving K-12 math and science education. (Huffingtonpost, 2013) Exxon Mobil isn't the only oil company to jump on the STEM bandwagon. Chevron added a new television commercial to support STEM entitled, "Science is Cool." Chevron's commercial states "Science Rules" and shows an eighth grade student working on a robotic claw project while a geologist explains that Chevron has invested \$100 million into science education.

Why the push from these companies, and others, to encourage students to go into STEM fields? In 2005 the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine compiled the report *Rising above the Gathering Storm* where they noted that the United States may not continue to be a world leader in science and technology unless a federal effort is put into place to bolster our competitiveness in science and technology. The Obama Administration responded to this concern in 2009 by launching the "Educate to Innovate" Campaign for Excellence in Science, Technology, Engineering & Math (STEM) Education. The campaign's three overarching priorities are to increase STEM literacy for all students, improve the quality of math and science teaching, and expand STEM education and career opportunities for underrepresented groups including women and minorities.

There is good reason to make STEM education a national priority. Take a look at this data from the STEM Education Coalition:

- ⇒ The top 10 bachelor degree majors with the highest medium earnings are in the STEM field.
- ⇒ From 2008-2018, STEM occupations will grow 1.7 times faster than non-STEM occupations.
- ⇒ 45% of those with STEM bachelor degrees earn more than PhDs in non-STEM occupations.
- ⇒ Over the past 10 years, STEM jobs grew three times faster than non-STEM jobs.
- ⇒ 60% of U.S. employers have difficulty finding qualified employees to fill their vacancies.

Unfortunately, the nation's K-12 education system is not keeping up with the STEM field's demand. While 93% of K-12 parents feel that STEM education should be a priority in the U.S. only 49% believe that it is. In addition:

- ⇒ Students are getting less time for science in elementary school than they did 15-20 years ago in almost every state (including Pennsylvania).
- ⇒ In the 2009 Organization for Economic Co-operation and Development assessment, twelve nations had a higher science average literacy score than the U.S.
- ⇒ Only 45% of U.S. high school graduates in 2011 were ready for college math and only 30% were ready for college science.
- ⇒ 40% of students who enter college as a STEM major fail to complete their degree.

Students participating in the STEM Magnet Program and their parents can feel good knowing that they are on the forefront of the nation's STEM initiative. With the strong push from regional school districts, and the support of industries, we can make a change in these statistics for our nation and, especially for our region.

Featured Employer:



KAWNEER ALCOA

Bloomsburg, PA

Located along the Susquehanna River is Kawneer Company, Inc., a part of Alcoa's Building and Construction business and leading manufacturer of architectural aluminum products and systems for commercial construction. With a commitment to advance the next generation of innovators, employees at Kawneer have partnered with the STEM Magnet Program at Bloomsburg University to encourage area high school students to enter the exciting, evolving industry of manufacturing; one that for them begins with their parent company, Alcoa.

Since 1888, Alcoa has directed its business with the vision, "to create innovative and sustainable solutions that move the world forward." First incorporated as the Pittsburgh Reduction Company, Alcoa started in Pittsburgh, PA. and was based on co-founder Charles Martin's technology which created aluminum through electrolysis. The company quickly outgrew its original facility and moved to New Kensington, PA where it expanded their business to include fabricated products. Implementing a vertical integration strategy allowed Alcoa to establish a core smelting business, a diverse fabrication model and venture into power generation.

Alcoa has been on the forefront of creating innovative engineering designs since 1989 when it produced the first aluminum tea kettle. Today, Alcoa's aluminum products have evolved to dominate the commercial aerospace industry, be significant in the automotive industry as seen in the new Ford F-150, and can be found on ships, furniture, windows, military equipment, military Humvee armor, drill pipe, buses, soda and beer cans, and even mobile phones.

Alcoa Building and Construction Systems' Kawneer business is meeting the needs of an evolving, more sustainable commercial construction industry with innovative, high-performance, energy efficient building products and solutions. Kawneer celebrates more than 100 years producing high thermal performing, sun control, blast mitigation and impact resistant products, which include entrances, framing systems, curtain walls, and windows. Diana Perreiah, president of Kawneer North America, regards Bloomsburg's Kawneer operations as an "invaluable flagship location." During a visit to Bloomsburg, she noted, "...one in every three doors you walk through in the U.S. are Kawneer doors, and more often than not, those doors were manufactured here in Bloomsburg."

Kawneer is a market leader in innovative, sustainable building solutions. At Kawneer Bloomsburg, engineers create product design and rigorously test solutions that meet the regional specifications, weather challenges, and building designs of their customers. Kawneer's innovation is apparent in the façade of buildings like the renowned Geisinger Center for Health Research in Danville, PA; its curving glass walls flaunt a dramatic appearance and its sophisticated green design earned Leadership in Energy and Environmental Design (LEED) certification. However, nowhere is Kawneer's innovation and dedication to the Bloomsburg community more apparent than the floodwall designed to protect the town and its buildings from future floods similar to Tropical Storm Lee in 2011. Though devastated by the flood, Kawneer continues to thrive, and advances with new additions to its facility such as an automated robotics area to replace ruined equipment.

The STEM Magnet Program is fortunate to have an innovative, forward-thinking, and community-minded partner in Kawneer. This partnership has greatly benefited our amazing students and will continue to inspire budding innovators in years to come.

From Our Students



It's hard to believe that the Fall 2014 semester is halfway over for the STEM Magnet Program students. So much has happened since they began on Monday, August 25. Here is a short synopsis of what they have been doing on Bloomsburg's campus.

The senior students in the program have been busy taking classes in calculus II and physics. While they will continue with calculus in the spring, soon they will be scheduling their final course for the STEM Magnet program. May 8, 2015 will see the completion of requirements for the first STEM Magnet Program class. It will be a proud moment for all students, parents, school districts, and Bloomsburg University. A STEM Magnet Graduation Reception is currently being planned and more details on this will be in the next newsletter.

Our juniors in the program have been just as active. Those in the health sciences track have been taking courses in visual basics and biology. The engineering track students are working through courses in Java and cryptology. Both tracks are finding their courses interesting and challenging. For support, juniors have study periods three days a week. During these study periods, their faculty either stop by the room or have available office hours to offer assistance. In addition, the program has a tutor who is available to tutor students with Java and math.

The study periods have also offered juniors an opportunity to listen to speakers in the STEM field. To date, faculty from the college have discussed careers in digital forensics and archeology, and current college students have talked about their majors and Bloomsburg's Science and Health Science LLC (Living & Learning Community). The addition of this programming, along with the study periods this semester, was requested by the school districts and has definitely been an improvement to the program.

But more enhancements to the program are coming! A new addition to the STEM Magnet Program will be occurring in December and January — the STEM Magnet Winter Break Program. During the winter break for the College, juniors will get professional development workshops, work on critical thinking problems, and go to externships with regional employers during which they will job shadow professionals in their fields. At the same time, seniors will have the opportunity to either take a winter course or complete an internship in their career field. As part of the internship, seniors will work with faculty to research their career area and create STEM education presentations that they can give to middle school students in the area school districts. Finally, five of the STEM Magnet Program juniors will also work over break on projects for the first PA Governor's annual STEM Competition project. The competition will be held regionally with the winners of the regional competition competing at the state level for scholarship money.

As you can see, the STEM Magnet Program has been and will continue to have a lot happening along with the college courses and credits that the students are receiving. The 23 juniors and 14 seniors who are participating are involved in exciting, novel, and fun activities that will be expanded upon in the spring semester. But don't just take our word for it; here are some thoughts about the program from our juniors:

"I'm glad I'm in the program because it is really beneficial and will help me with what I want to do in life. I started out wanting to be a nurse, but now I'm thinking about being a doctor. I like this program because it gives me a head start toward my goals. The professors are open and easy to talk to here. I like having the ability to go to them with questions. The program also gives me the chance to meet students in other schools who want to go into the same career. I think it is definitely a great program because it helps with the transition into college." — Katelyn Miller, Berwick Area High School

"I came into this program to get ahead in college and to get a feel for what college is about. I'm learning to handle college classes which is different than high school. There are fewer tests in college. I'm interested in biology and want to be a doctor. The program is nice and everyone is friendly. Plus I don't feel like I'm missing out on high school." — Moiz Khan, Danville Area High School

"I came for the college experience. I get to meet new people, make new friends, and be treated more as a grown up. I get to work with professors that have new teaching styles and I'm excited that I am getting college credits during high school." — Logan Cheesman, Bloomsburg Area High School

"I like the supplemental experience that I get in science and technology in the program that I don't get in high school. I'm planning on going into mechanical engineering because I like that it is creative; you get to design and build new things that weren't there before. Now I'm getting experience and knowledge to do this plus I'm with students from the area who have the same interests but sometimes different insights." — Stephen Eyerly, Central Columbia Area High School