

Future Teachers Find New Problems to Solve in Integrative STEM Lab

In the past few months, Osburn Hall's Integrative STEM Lab and Resource Center (iSTEM LRC) has seen a bit more action. That's because the students preparing to be Early Childhood Education teachers who are enrolled in the Integrative STEM Education Methods (ISEM) minor are spending more time exploring some of the new tools and materials available in this facility. This is made possible due to some of the extra financial support available through Sharon Brusnic's National Science Foundation (NSF) grant, *Integrative STEM for Teachers of Young Students (iSTEM4ToYS)*.



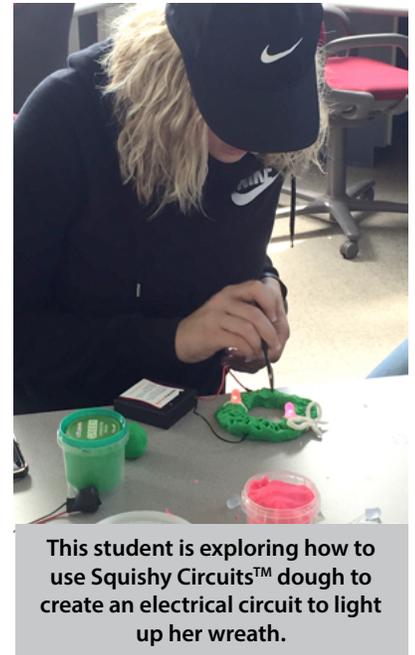
Taylor Neuman (Graduate Assistant, standing in middle) shows these future teachers how to use some of the new gadgets, kits, and robots available in the iSTEM LRC.

Taylor Neuman is a graduate student in AEST's Technology & Innovation program. She was hired through the iSTEM4ToYS grant and part of her graduate assistantship responsibilities is to supervise open labs in this space and to provide motivating activities and projects for ISEM students and Technology & Engineering Education majors to do when they

visit the lab to learn and explore. Taylor has led activities to engage these future teachers in all kinds of imaginative and inventive problem-solving and design experiences. For example, students learned to build Squishy Circuits™ that basically use conductive and non-conductive play dough to create the connections between circuit components. Taylor also engaged students in designing and building computer controlled devices with Makey Makey® -- an incredibly versatile interface that enables users to turn everyday objects (e.g., bananas, aluminum foil, pencil markings) into computer touch pads that can connect to the computer and control games, music, and more. ISEM students learned to use a 3D printing pen – the 3Doodler® -- to create 3D plastic objects, designed and launched straw rockets, and used KEVA® planks to erect structures in response to an open-ended challenge. They also learned how to use an

app on their phones to control a spherical robot named Sphero.

This summer the lab will be repainted and there are plans to expand the resources in this facility in the months ahead. The iSTEM LRC is a great place for all future teachers to spend time making, designing, and learning...and, it will get even better as we continue to transform the space and open up more opportunities for future teachers to “play” and learn in this facility. We believe that teachers who are creative, inspired, and confident are much more likely to pass on that enthusiasm for learning and doing to their students. The iSTEM LRC is just one way that we are helping to shape and inspire these kinds of teachers!



This student is exploring how to use Squishy Circuits™ dough to create an electrical circuit to light up her wreath.



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Dr. Sharon A. Brusnic, TECE Coordinator

Recruit One Today!

Did you know that today's teachers are the #1 recruiters of the next generation of teachers?

RECRUIT ONE!

Look around. Find the student who you believe has the potential to become a Technology & Engineering Education teacher. Encourage your student to consider this dynamic profession that is in high demand. Share resources. Mentor this student to follow through and apply for admission to our Technology & Engineering Education teacher education program.

The future of Technology & Engineering Education is in your hands. (If every teacher recruited just ONE, we wouldn't have a shortage.)

Millersville University
Department of Applied Engineering, Safety & Technology
For More Information:
Dr. Sharon Brusnic
Coordinator of Technology & Engineering Education
201 W. Frederick St.
Millersville, PA 17329
www.millersville.edu/tece
717-874-5248
Sharon.Brusnic@millersville.edu

Pennsylvania and states all across the country are facing a major shortage of Technology & Engineering Education Teachers. Take a moment and click on the link to the right to download some important information. If all of you recruit **just one** current student, we wouldn't have a shortage.

AEST Hosts Local Science Fair Winners

On Tuesday, 11 April 2017, the Department hosted members of the ASM-International; South Central Pennsylvania Chapter monthly meeting. ASM-International is dedicated to being the world's largest and most established materials information society. Formally known as the American Society of Materials, it strives to engage and connect members to a global network of peers through reference content and data, education courses, international events, and research. In the past few years, the local chapter, through support from the International office, has sponsored Materials Teacher's Camps held in Osburn Hall.

The Dean of the College of Science and Technology, Dr. Mike Jackson, and the Chair of the Department, Dr. Len Litowitz were on hand to bring greetings from the University. The April 2017 monthly meeting was to recognize several groups. The first group included Science Fair winners from the greater Lancaster, York, and Harrisburg areas. Students from middle schools/junior high schools, and high schools were recognized for outstanding science fair entries. Each were provided a cash prize and a free student membership to ASM.

Mr. Simon Munyan, from the Elizabethtown Area High School, presented his activities at the locally sponsored Drexel University Student Materials Camp and the nationally sponsored Eisenman Student Materials Camp. The Eisenman Camp was sponsored and held at the ASM World Headquarters in Materials Park, Ohio (located near Cleveland, Ohio).

To round out the evening, members of the Student Chapter of the Society for Manufacturing Engineers (SME) of the Department presented the design challenge they face for the coming year. Mr. Samuel Brennan presented a video that explains the challenge for the student group: to create a vehicle that can meet many different requirements. Included were safety guidelines that must be followed to crossing over some of the worst terrain the contest committee can think up! Plans are still under development, but the group is energized to compete in the next year. Dr. Alex Johnson is the faculty advisor. The entire ASM group and Department members wished him and his team good luck for the future.

Dr. Kenneth P. De Lucca ■

Marketing AEST Programs

Please help us market our programs! Everyone talks about elevator speeches – conversations that include a few stump lines or key points that they try to leave an audience within 60 seconds or less. Here are a few of the stump lines I use when marketing our programs here in AEST. They are all posed in the form of questions as follows. Did you know?

1. There are more than five employment requests for every Technology & Engineering Teacher we graduate
2. Our Occupational Safety & Environmental Health majors are employed at 98% placement in their field with an average starting salary of \$52,000
3. More than 60% of our Applied Engineering & Technology Management majors who interned were offered full-time employment by their host companies
4. Our Robotics teams have won more than 36 national awards within the last 15 years

Dr. Len S. Litowitz, Department Chair ■

New OSEH Faculty Member

The Occupational Safety & Environmental Health (OSEH) Program conducted a successful search to fill the faculty position that was open as a result of Dr. Paul Specht's retirement. We are pleased to announce that Dr. Betty-Jo Legutko will be joining the OSEH faculty in the fall of 2017.



Dr. Legutko holds a Doctorate degree in Leadership from Alvernia University, a Masters in Business Administration from Pennsylvania State University and a B.S. in Environmental Engineering Technology from Pennsylvania State

University. Dr. Legutko comes with over 15 years of industry experience in Environmental Health and Safety. Please join us in welcoming Dr. Legutko to Millersville University.

Dr. Jack O. Ogutu ■

A Field Trip to Osburn Hall

How do you get high school students interested in going to college and majoring in programs such as those offered through the Department of Applied Engineering, Safety & Technology (AEST)? Todd Brown and Michael Minchoff, Technology Education teachers at Solanco High School (Quarryville, PA), decided that their students could greatly benefit from a trip to Millersville University to see their alma mater.

On May 3, 2017, Brown and Minchoff brought some of their students on a field trip to Osburn Hall. The visit started with an introduction to all of the programs available in AEST, including Technology & Engineering Education (teacher preparation), Applied Engineering & Technology Management (with 7 technical concentrations), Occupational Safety and Environmental Health, and Automation & Intelligent Robotics Engineering Technology. Dr. Litowitz provided this 15-minute overview to the group using slides and photos to explain each program area. Then Dr. Litowitz and Dr. Sharon Brusica divided the group and took them on a tour of Osburn Hall. During the hour long tour, the Solanco High School students were able to see firsthand how college students are learning by doing in the 19 AEST labs. In some labs, they were able to ask questions of other professors or students who happened to be available in the facility. It was a great opportunity to get a realistic view of several great programs that these high school students might want to consider for their college studies. After the tour, Dr. Litowitz led this group through a quick engineering design and problem-solving activity.

It was a productive visit and a win-win situation for both the high school visitors and AEST. In fact, Todd Brown noted, "I found it very interesting that at the beginning of the day no student was willing to admit that they may be interested in attending Millersville or specifically major in one of the majors in your department. However, at the end of our tour over two-thirds of the students picked up literature or camp information... Even students who did not have Millersville on their radar now have it high on their list. The exposure was great for them, and us too." AEST was able to promote its programs and the high school students were able to learn about some college opportunities that they may not have fully considered before. We are thankful for teachers like Todd Brown & Michael Minchoff – and others over the years – for taking the time to make this field trip a part of their curriculum.

If you are a high school teacher, please give consideration to arranging a field trip to Osburn Hall in the future. We welcome the opportunity to host students from your class, especially those who might one day be interested in coming to MU and enrolling in one of our programs. If this is of interest to you, please contact Dr. Sharon Brusica at Sharon.Brusica@millersville.edu or 717-871-5548 for more information. We will gladly work with you to find a mutually convenient time to showcase what we can offer and engage your students in an educational field trip.



Dr. Sharon A. Brusica, TECE Coordinator

DART Foundation Awards Mini Lathe to Department



Kids participating in the 2017 Technology and Engineering will have an opportunity to take a new class entitled Machining for Kids. The new bench top metal lathes that will be used in this class were made possible, in part, by a grant from the Dart Foundation, entitled Machining for Kid's Camp, which was proposed by Dr. Len Litowitz and Dr. Alex Johnson. The grant along with matched funds from the College, will allow the department to purchase eight 7x16 HI Torque bench top metal lathe packages. These small scale metal lathes will be used to teach students participating in the upcoming camp the fundamentals of metal lathe operation in a safe, and fun hands-on environment.

In addition to their use during the upcoming summer camp, these lathes will also be utilized in Material and Processes classes in the upcoming fall semester.

Dr. Alex Johnson

Osburn's Iron Handpress is Alive and Well

Relief printing, or better known as letterpress printing, is printing from a raised surface. It was the main mode of printing for over 500 years. Press designs made a dramatic change from the Common Press, constructed of wood during the colonial period, to the Washington Press, made of cast iron at the beginning of the industrial revolution. Also known as an Iron Handpress, the Washington Press was a style manufactured by a number of companies. The one in the photo was manufactured by the Hoe Company of New York. Each press was numbered as they were produced, the number on this one is Hoe #6070, and was built in 1905. According to our records, Dr. Burl Osburn purchased the press second-hand for his personal use in 1949 for \$75.00. The AEST department received the press as a gift from the Osburn estate 2008. The press, which was set up in the family dining room, was in fairly good shape. His family said they couldn't remember a time when the press wasn't locked up with a typeform and Osburn was printing something. Dr. Tom Bell and his students have been conducting research on the press and letterpress processes. In addition to setting lead type for printing, the use of newer technology such as photopolymer plates has allowed Osburn's press to be more than a conversation piece. The photopolymer plate material is exposed, processed and mounted on an aluminum block to the specific measurement of .918, or typehigh. With proper press adjustments, the quality of the prints are excellent. Setup and printing on an iron handpress is a time-consuming process, not to mention the physical demands of making each impression. Using Osburn's press allows students to experience and appreciate a piece of history.



Burl Osburn was hired in 1932 to teach graphic arts at Millersville State Teachers College, and was the Director of Industrial Arts from 1941 until his death in 1962. He wrote a number books dealing with a variety of topics, including printing. Notably he co-authored "Exploring the Graphic Arts" in 1942. I'm sure Dr. Osburn would be thrilled to see his iron handpress in operation and know that students are still learning from him.

Dr. Tom Bell ■

Construction Option Changes Title

Starting in fall 2017, the bachelor's degree in Applied Engineering and Technology Management (AETM) - Construction Technology concentration will be updated with a new title. The AETM-Construction Management concentration and will include two new courses: ITEC 347-Engineering Visualization and ITEC 348-Green Buildings and Sustainable Systems. Students in ITEC 347 learn how to visualize a construction process by 4D (3D models + time) modeling application. ITEC 348 covers fundamentals of green buildings and sustainable energy technologies and their dynamic costs and benefits. This course allows students to explore the integration of design principles and application of renewable energy, natural building materials, and ecological landscape into building design and community development. In addition to these two new courses, Building Information Modeling (BIM) will be added to the existing course, ITEC 346-Architectural Drawing and Design. BIM represents building elements such as beams, columns, and walls as smart three-dimensional (3D) objects that include embedded data such as geometry details, energy use data, and lifecycle cost information. The realization of these changes will not only allow students to seek positions as architectural drafters, but also allow them to seek employment in BIM related roles such as BIM manager, BIM coordinator, BIM modeler, BIM drafter, and BIM consultant.

Dr. Ebrahim Karan ■

AEST to Host PATT Conference



The AEST Department will be hosting a major international research conference this summer in Philadelphia, PA. The PATT Conference, short for Pupil's Attitudes Towards Technology will take place from July 10 - 14, 2017.

Colleagues from about twenty countries will be attending and presenting at the international PATT conference. Presentations are research-based and have international relevance.

Interested in attending?

For information or questions, contact Marc de Vries at m.j.devries@tudelft.nl, or Len Litowitz at llitowitz@millersville.edu.

Inspiring Women to Choose Engineering & Technical Careers

Last spring a review of demographic data from the Applied Engineering, Safety, and Technology (AEST) Department confirmed what we already knew — there are fewer women enrolled in our degree programs than men. In fact during spring 2016, just 16.6% of AEST students were female. This is low considering that on average one in four employees in technical and engineering fields are female. In an effort to inspire more young women to select an AEST degree program, Dr. Sharon Brusic and Prof. Donna Painter developed the first ever Girls Careers in Engineering & Technology Seminar.

This seminar was held on October 27, and was attended by twenty-nine high school girls along with their parents and teachers. The seminar included a faculty-developed presentation about the kinds of careers that are in high demand in engineering and technical fields, as well as degree programs offered in the Department of Applied Engineering, Safety, and Technology, and a tour of Osburn Hall's labs and facilities.



Amanda Piergallini [left], a junior in B.S.Ed. Technology & Engineering Education, talks informally with two high school students and a parent.

Millersville University

The Department of
Applied Engineering, Safety & Technology
PO Box 1002
40 East Frederick Street, Osburn Hall
Millersville, PA 17551

717/871-7237
<http://www.millersville.edu/aest>
aest@millersville.edu

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One of the primary aims of this seminar was to provide role models for young women who are considering entering an engineering field. To help meet this goal the program included current AEST students — Abigail Barnhart, Morgan Darrah, Tiffany Edwards, Ashley Latz, Marie Leatherman, Brittany Myers, Amanda Piergallini, and Katie Remely — who shared experiences about their degree programs and career paths. Additionally, the seminar included a panel discussion with recent AEST graduates who are currently working in technical and engineering fields. Panelists included:

- **Jana Bonds**, Technology and Engineering Educator, Emory H. Markle Intermediate School
- **Katherine Miller**, Environmental Health & Safety Manager, Armstrong World Industries
- **Colleen Moore**, Product Designer, Brentwood Industries, Inc.
- **Erin Nuss**, Associate Manager of Education, Specialty Graphics and Imaging Association
- **Heather Scheuring**, Project Manager/Controls Engineer, Keystone Engineering Group, Inc.
- **Lexi Scrivano**, Market Coordinator, Benchmark Construction Company

The panelists shared stories from both their college and workplace experiences and provided valuable insight about their career decision-making processes.

Initial feedback indicates that this seminar was successful. Survey data found that 95.6% of girls and their mentors found the seminar to be “very helpful” or “somewhat helpful”. The most favorable parts of the program, as rated by participants, were the panel discussion with recent graduates and the faculty-developed slide show presentation. Additionally, the girls’ perspectives about careers in engineering and technology changed as a result of the seminar. Prior to the event, 31% of girls were either undecided or not likely to choose an engineering or technology career. Following the event, this percentage declined to less than 8%. Additionally, most girls (88%) showed some interest in an AEST major.



The seminar was free for participants and their mentors, and was partially funded by the Millersville University President's Commission on the Status of Women. Vilas A. Prabhu, Provost and Vice President for Academic Affairs, and the AEST Department provided additional funding.

Ms. Donna M. Painter