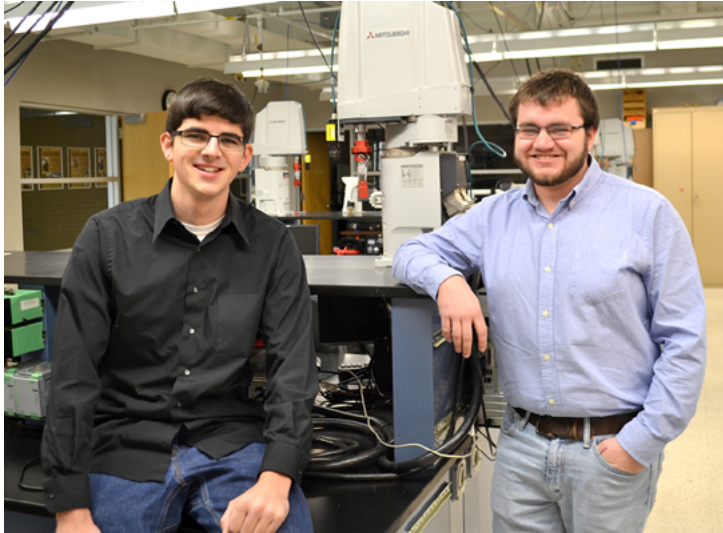


## First Graduates from ARET Major



**Kevin Wagner and Quentin Kilgore**  
First ARET Degree Graduates, Fall 2017

The Automation & Intelligent Robotics Engineering Technology (ARET) degree was approved by the State of Pennsylvania in November 2015. The degree is a hybrid study of automation/robotics and computer science and now has approximately 25 majors. The first graduates, Kevin Wagner and Quentin Kilgore, of this relatively new program will enter the next chapter of their life as gainfully employed engineers come January.

Kevin Wagner will be joining Multi-Dimensional Integration (MDI), a long-time employer of our robotics and control systems graduates, as a Controls Engineer. MDI is a systems integration company that has offices in Shrewsbury (Headquarters) and Allentown. Kevin began working for MDI in June in the panel shop, and will now be advancing to working with a number of clients with systems integration, PLC programming, software upgrades, and general support in his new role with the company.

Quentin Kilgore started working for Engel Machinery as an intern in May 2017. In January, Quentin will be advanced to a Software Engineer for the Austrian Company. Engel Machinery manufactures injection-molded machinery (IMM) and integrates robots/automation for customers such as Tesla, 3M, and TE Connectivity. Come February, Engel is sending Quentin to Schwertberg Austria for three months of specialized training on their custom design Cartesian robots, as well as, their custom-programming interface for KUKA robots.

Congratulations to Kevin and Quentin! We wish them success in their new engineering roles and life adventures.

**Dr. John Wright, ARET Coordinator** ■

## AEST Capital Campaign Launched

The AEST department is embarking on an external fundraising campaign for equipment and facilities in order to maintain the health and vitality of the department, to provide space for growth, and to help keep tuition affordable for all students. Plans are to construct annex space that would allow us to teach Construction courses on campus and to provide for additional project and research space for the department. The university will match the first \$50,000 raised dollar for dollar, and planning for the new facility can begin once we reach the \$100,000 mark. So, be a Stud (or a Studess) or maybe even more! While contributions are welcome at any level, some unique funding levels have been established.

Target Funding Levels
\$100,000 <i>Superstructure</i> <small>(includes naming rights)</small>
\$25,000 <i>Pillar</i>
\$10,000 <i>Truss</i>
\$5,000 <i>I-Beam</i>
\$1,000 <i>Stud</i>
\$500 <i>Sill Plate</i>
\$250 <i>Anchor Bolt</i>
\$100 <i>Footer</i>

[Click here to make your tax-deductible donation today!](#)

**Dr. Len S. Litowitz, Department Chair** ■

## Exciting Changes in the Grad Program

Over the last couple of years, the graduate program in the Department has gone through some major changes. The first change was to the program name. It was changed to a Master of Technology & Innovation. This name change was done first to set the stage for the curriculum change that quickly followed. The core courses were changed to reflect the universal and enduring thinking processes associated with technology and innovation. The three new courses are *EDTE 603: Applying Creativity by Design*, *EDTE 604: Engineering Principles and Concepts for the Non-Engineer*, and *EDTE 605: Applying Critical Thinking and Decision Making*. Another change to the program that was being fostered in these early stages was the recruitment of students from a wider range of backgrounds. Technology and Engineering Education teachers are still the primary audience but there has been an increasing number of teachers from other content areas including elementary education, gifted education, STEM education, geography, library science. Furthermore, the program is now attracting students from other areas such as architecture, engineering, the sciences, the fine arts, and entrepreneurs and other business people. This mix of students from such wide-ranging backgrounds is a new source of enrichment for everyone's experiences in the program.

Which leads to the most recent change to the program. As of January 1<sup>st</sup> the program will officially be a recognized Master of Science Degree with two concentration areas – Education and Enterprise. The increasing number and variety of students entering the program (there are 32 active students in the program as of Spring 2018) has resulted in a program reorganization that led to the new Master of Science in Technology & Innovation degree program. The education track is exactly like the old M.Ed. program.

*Continued on page 2*

# Millersville University to Host International Graphic Conference in 2018

The Graphic Communications Education Association (GCEA) will hold their annual conference at Millersville University in the summer 2018. GCEA is a professional association of educators, in partnership with industry, who are dedicated to sharing knowledge relating to graphic communications and imaging technology. This year's conference theme is *Composing our Future: Design, Technology, and Pedagogy*. It begins on July 29 and runs through August 2, and includes professional development opportunities for teachers and industry professionals alike. For graphics teachers, the conference offers opportunities to learn about emerging technologies, get project ideas, share experiences with others in the field, and make connections with area businesses.



Details of the conference schedule will not be finalized until late February, but some highlights include:

**Industry Tours:** Conference participants will be able to choose which of the following print production facilities they would like to visit—LSC Communications or the H&H Group. This is a great opportunity to see industry in action and make connections with area businesses.

**Industry Economic Outlook Breakfast:** On Wednesday, August 1, Dr. Ron Davis, Senior Vice President and Chief Economist will present an *Industry Economic Outlook*. This event will be open to industry leaders as well as conference participants, and includes time for networking over breakfast.

**Interactive Design Track:** To keep with our conference theme of *Composing our Future: Design, Technology, and Pedagogy*, an interactive media and emerging graphic technologies track is being developed. We have invited presenters to provide workshops and sessions in various design and technical areas. A great opportunity for teachers who are looking for ways to expand their curriculum beyond print.

**Recognition of Gutenberg Award Winners:** Each year GCEA members submit the best of their students' work in printed projects, digital photographs, and websites. Those student works will be displayed and the winners in each category will be recognized at this year's conference. This is an exciting opportunity to see the kinds of work that our next generation of graphic communication leaders are creating.

If you currently teach graphic communication, or have an interest in the industry, please consider attending this conference. It is a great opportunity to get an update in graphic communication, and it's happening at Millersville from July 20–August 2, 2018. For event details contact [Donna Painter](#), the conference host or visit <http://www.studentservicesinc.com/uncategorized/gcea-annual-conference/>. We are very excited to have been selected to host of this prestigious event, and hope that you will consider joining us in July.

Ms. Donna M. Painter, M.Ed. ■

## Tech Camp Turns 25

The Technology & Engineering camp program has now been offered for 25 consecutive summers here at Millersville University. The original camp consisted of only the computer controlled LEGOs but the camp program quickly expanded to include offerings in CADD, Aviation and Robotics. Today approximately 30 camps are offered throughout June and July on approximately 20 different topics. Some of the topics such as 3D Printing and Cybersecurity were not even an inkling on anyone's radar screen at the time the camp program was founded.



The 2018 camp schedule will be posted in March. Here is a link to our link to last year's camp program: [Technology & Engineering Camps](#)

Dr. Len S. Litowitz, Department Chair ■



## Grad Program, continued

*Continued from page 1*

The only change is that students will now receive a Master of Science degree. Interviews with school district superintendents and curriculum leaders in Lancaster and Chester County indicated that the switch to a Master of Science Degree would not affect their acceptance of the degree for their teacher's professional development needs. The enterprise track has an enterprise core that replaces the education core and addresses the professional development needs of non-education directed students. In the enterprise core students can select from business and mathematics courses. As with the education concentration, students taking the enterprise concentration will also be able to select from three degree completion options including a thesis, a research and development project, or they can take five elective courses.

All of these changes have resulted in growth for the graduate program. For the foreseeable future, the program will be on solid footing with a strong curriculum, healthy enrollment and graduation numbers (seven graduates in the spring of 2017), a degree offering that provides lots of options for each student's professional development needs, and strong support from the department, the College of Science and Technology, and Graduate Studies and Adult Learning, and Millersville University.

[To view degree organizational structure click here.](#)

Dr. Scott Warner, Graduate Coordinator ■



# Digital Electronics: Celebrating 10 Years of Designing Printed Circuit Boards

Years ago, we used to manufacture our own printed circuit boards (PCBs). This involved the costs related to the purchase of copper clad board, the cleaning of these boards, coating the boards with a photo-sensitive film, exposure of the board to a negative, a liquid solution to develop the board, and then, finally, etching the board in a ferric chloride solution. The process did not stop there. There was always drilling the board's holes with a #64 drill bit-some of you may remember that process like I do. But wait, there's more. There was the clean-up of the developing solution and then disposal of the ferric chloride. Lastly, the "etchers," as they were called, needed a huge amount of maintenance. Pumps regularly failed, plastic tubing broke down and leaked-needless to say it was a nasty job just to keep the etchers up and running.

We went several years without a PCB experience in our classes for Robotics & Control Systems majors. It was thought to be a short-coming of the curriculum, but how to present students with a "real world" PCB experience? After discussions in the option a "middle way" was implemented, an experience that was more like that practiced in industry.

The PCB experience was moved to an advanced class (ITEC 364 Digital Electronics). It was determined that students would have a greater experience with components and troubleshooting by that time. Here is the process we currently use:

1. Students are given a schematic of an introductory electronics circuit. The circuit would be made up of several integrated circuits, and/or an input device or output device. Input devices included switches, microphones, photocells, etc. Output devices included light emitting diodes, speakers and 7-segment light emitting diodes.
2. Students *must* get the circuit up and running on a solderless breadboard (protoboard) first. The circuit must function completely. Some students, at this point, changed the circuit to complete different functions in different ways.
3. A new schematic was created by the students with software contained on Department computers. This was the circuit design that the students now used.
4. Now, the hard part. Students would now translate the schematic into a PCB. At the beginning of the class, students were suggested to make up *only* one sided PCBs. However, by the end of the design phase, several groups wanted to try double sided boards. The great news is that they were successful!
5. A free software package was provided by a PCB manufacturing firm located on the Internet. Students used this software package to translate a schematic into an actual single sided or double sided PCB.
6. The least expensive PCB package included three of the same boards to be created and shipped back to us. Because of this, each laboratory group member and I could keep one.
7. Once received from the PCB manufacturer, students stuffed the boards with integrated circuit sockets, chips, and other components with the *hope* of the boards functioning properly after assembly.
8. At this point, troubleshooting ensued! Fortunately, we had more successes than failures. It is possible that even *more* learning took place with these problems.
9. Students would then present their schematic, discuss the operation of the circuit, and discuss the final product which included the good, the bad, and the ugly of PCB design!

Figure 1 shows a laboratory group made up of Ethan Bressler (left) and Noah Hawkins as they make their presentation. Figure 2 shows Ethan describing the operation of the circuit. Figure 3 displays the project created by Dan Simms and Randy Mercado. All photos by Bill Horst.

It is believed that this experience provides much more than just creating a PCB. This activity gives students the opportunity to design a circuit (perhaps with only minor changes), create a schematic with software available in the Department, translate that schematic into a PCB with another software package provided free of charge from the manufacturer, stuff and troubleshoot the circuit for 100% operation. This activity, it is thought, certainly mimics industrial applications.



Figure 1

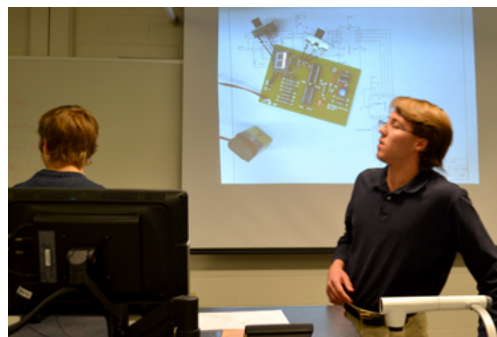


Figure 2

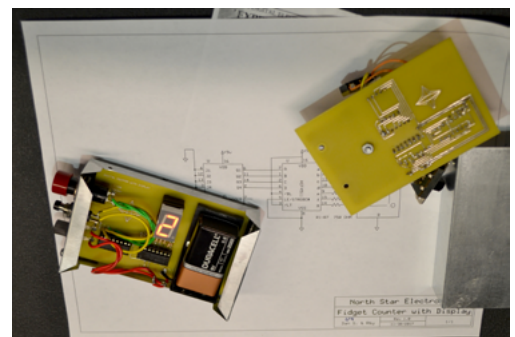


Figure 3

Figure 1 (left): Ethan Bressler and Noah Hawkins make their presentation on the project.  
Figure 2 (above): Ethan Bressler describes the operation of the circuit.  
Figure 3: (above right): project created by Dan Simms and Randy Mercado

# TEECA Conference a Big Success!

Technology & Engineering Education Collegiate Association (TEECA) members proudly represented Millersville University at the TEECA Eastern Regional Conference in Virginia Beach, VA from November 9-11, 2017. Twenty-eight students ranging from freshmen through seniors, plus five advisors/faculty, participated in this conference. Congratulations go out to the following student teams who brought home a total of seven awards.



[TEECA@MU at 2017 TEECA Eastern Regional Conference](#)  
[CLICK HERE TO SEE MORE PHOTOS OF TEECA@MU](#)

## First Place

- Teaching Lesson: Amanda Piergallini & Abigail Sweeney
- Technology Challenge: Dan Simms, Ashley Lucabaugh, Luke Rhine, and Thomas Kauffman
- Robotics: Al Gallo, Luke Rhine, and Marie Leatherman

## Second Place

- Manufacturing: Carla DiStasio, Lauren Woods, Joseph Kaskel, JC Egresitz, Zach Scher, and Jeffrey Swartz
- Instructional Module: Lauren Coker and Joshua Handshaw
- Transportation: Adam Kennedy, Spencer Hall-Yurasits, Ryan Walburn, Michael Clappison, and Patrick McCarty

## Third Place

- K-5 STEM: Ashley Lucabaugh, Vivian Feliciani, Saarahi Navarrete, and Lexi Iagnemma

The competitions were challenging, but all TEECA members competed well in every event they entered. In addition to participating in competitive events, students engaged in a team-building experience, interacted with potential employers at the job fair, and networked with about 200 peers and professors from about ten universities throughout the Eastern seaboard region during meal and social functions.

This annual conference is hosted by a rotating list of universities and this year was MU's turn to organize the annual event. This meant that the weeks and months leading up to the conference were busy ones as students, faculty, and advisors made preparations for the annual event. One of the key aspects of the program that was designed and led by the TEECA @ MU students was the team-building experience called The Amazing TEECA East Race. Participants had to engage in a variety of different activities as a team and be first to complete the circuit in order to win "a bag of cash" at the end. All of the activities were organized

and led by TEECA @ MU students and involved everything from a donut-eating contest, sand bagging on the beach, digging for hidden toys in the sand, matching inventors, balancing on a beam, and much more. Everyone who participated had a great time engaging in the event.

Another highlight of the conference was the keynote speaker during the dinner banquet. Mr. Scott Didra (MU class of 1981) entertained and inspired guests with his Reach for the Stars presentation which combined incredible stories about some of his teaching experiences over the course of his 35 years in the field. He also captured everyone's attention with a few ingenious magic tricks that engaged audience members on stage. It was a memorable and motivational experience for all.



**Scott Didra '81**  
"Reaches for the Stars" at the  
2017 TEECA Conference

Congratulations go out to all TEECA @ MU students who participated in this conference and who helped make the event so successful. The 2017 officer team is to be particularly commended for their leadership to help organize the membership, solicit funding to support conference attendance and travel, and to plan this professional development experience. Many thanks also go out to numerous faculty, staff, and students who contributed their time and resources to help plan and implement this conference.

[CLICK HERE TO SEE MORE PHOTOS OF TEECA@MU](#)

**Dr. Sharon Brusic, TECE Coordinator**

## Students Earn Professional Certification

Total Quality Management Students took the Certified Technology Manager (CTM) Professional Certification Exam on December 12th. 20 of the 24 students passed the open-book, 160-question, multiple-choice examination. The CTM includes questions on Leadership/Self-Management, Systems, Processes, Operations, People, Project, Quality, and Risk.



While the exam's national pass rate has hovered around 60% for the last two years, our Applied Engineering and Technology Management (AETM) students exceeded this rate significantly with a 83.3% pass rate. The CTM is one of several professional certifications offered by The Association of Technology, Management, and Applied Engineering (ATMAE). ATMAE is also the professional accreditor for the Department's AETM Bachelor of Science degree program. Congratulations to the following students for passing the CTM!

Marthelis Abreu, Madeline Bartush, Jacob Grover, Tate Gugino, Samuel Hahn, Tyler Kessler, Michael Marks, Cody Martin, Sean McMullin, Dakota Michael, Zachary Miller, Jamahl Oglesby McKay, Andrew Pearson, Kenneth Ravel, Kaitlyn Remely, Gabriella Rizzo, Andrew Spisak, Zachary Stumbaugh, Megan Wentz, Michael Wiles

**Dr. John Wright, ARET Coordinator**



## 2017 TEEAP Honors

The 65th Annual TEEAP Conference took place on October 27-28, 2017 in Lancaster, PA. This year's SEAM Conference theme was "Change Again: ESSA and Career Readiness."

TEEAP recognizes individuals for their contributions to the profession, organization, and for their potential for future excellence.



Jeffrey Swartz is a freshman Technology & Engineering Education major at Millersville University was awarded the William J. Wilkinson Scholarship. The scholarship is awarded to an outstanding high school graduate who has enrolled in an undergraduate Technology & Engineering Education program. The applicant submits a resume of noteworthy achievements, proof of academic excellence, and recommendations from three individuals.

In-service TEEAP members also garnered some recognition:

- Jeff Seamans, Lifetime Achievement Award
- Joanne Trombley, Ambassador Award
- Phil Grigonis, Innovative Educator Award
- Molly Miller, Emerging Leader Award
- William Turner, Cooperating Teacher Award
- Chris Sauer, Cooperating Teacher Award

Read more about the TEEAP STEM Conference 2017 on their Web site: [www.teeap.org](http://www.teeap.org)



## EPT Inducts 27, Awards 4 Laureates

Epsilon Pi Tau (EPT) inducted 27 Applied Engineering, Safety and Technology students this semester. Those honored are Abigail E. Barnhart, Matthew M. Blackmon, Nicholas A. Bozzelli, Samuel Brennan, Weston B. Chambers, Michael C. Clappison, Joshua L. Handshaw, Rebecca L. Howell, Adam C. Kennedy, Quentin D. Kilgore, Cole Lefever, Betty-Jo Legutko, Cody A. Leisey, Ashley N. Lucabaugh, Patrick McCarty, Nicole L. McNerney, Andrew J. Miller, Brittany M. Myers, Kaitlyn N. Remely, Jacob B. Robison, Andrew M. Sellers, Abigail B. Sweeney, Daniel M. Vazquez, David R. Wacker, Michael P. Wiles, Lauren C. Woods, and Joseph R. Wright. Four Laureate Citations were also presented to Thomas J. Bechtold, Scott F. Framer, Robert S. Swisher, Jr., and Daniel P. Quinn



## MU Hosts 2017 PATT Conference

Millersville University's Technology & Engineering Teacher Preparation Program hosted the 2017 Pupils Attitudes Toward Technology (PATT) Conference in Philadelphia this past July 10th -14th. This international research conference brought people together from more than 20 countries to present contemporary research about technology & engineering education. The conference was held at the Wyndham Hotel in the historic district. As part of the conference, participants enjoyed a cultural tour of the greater area that included Longwood Gardens, a stop at Osburn Hall on the MU campus, and a tour of Amish Country. A formal dinner was held at the City Tavern where George Washington held his inaugural ball toward the end of the program. We had a visit from Ben Franklin! In addition to Americans, conference participants from Sweden, New Zealand, Australia, Ireland, France, Finland, the UK, Canada, Israel, the Netherlands and more attended.



Dr. Len S. Litowitz, Department Chair

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The **abbozzare** is a newsletter published  
by The Department of Applied Engineering,  
Safety & Technology at Millersville University of Pennsylvania.  
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