THE STATE OF MICHIGAN, and the nation, need a highly trained engineering technology STEM workforce with baccalaureate degrees to compete in the global economy. To begin to address these workforce needs, Michigan Technological University received $1 million from the National Science Foundation for a five-year student scholarship and retention project. The Engineering Technology Scholars – Improving Retention and Student Success (ETS-IMPRESS) project provides financial support and an ecosystem of high-impact curricular and co-curricular activities to increase the success of academically talented students. A total of 12 first-time students will be supported for four years of STEM study, and 36 students transferring from community colleges in the state of Michigan and neighboring states will be supported for two years. The project will focus on expanding the number and diversity of academically talented and financially disadvantaged individuals entering and completing degrees in Engineering Technology at Michigan Tech. The project brings together Michigan Tech’s programs in engineering technology and programs in the Pavlis Honors College, an inclusive and unique college designed around high-impact educational practices. Targeted majors are: 1) Electrical Engineering Technology, 2) Computer Network and System Administration, and 3) Mechanical Engineering Technology.

Nasser Alaraje, professor and program chair of the Electrical Engineering Technology program at Michigan Tech is the principal investigator and project director. Alaraje says, “This grant will allow us to provide a unique opportunity to engage academically talented engineering technology students in activities designed to foster leadership, technical know-how, and employability skills for technology fields that actively recruit and employ graduates from diverse backgrounds and communities. Our overall goal is to increase student retention and graduation in these fields, which are vital to the regional and U.S. economy.”

“This program represents a unique partnership between the honors college and our majors to explore the most effective ways to produce graduates who are ready to manage the unique and demanding challenges of the 21st century STEM workforce,” says Lorelle Meadows, dean of the Pavlis Honors College and co-PI on the grant.

The comradery, enthusiasm and empowerment are evident within this first cohort of students. The partnership between the School of Technology and the Pavlis Honors College has provided a community foundation for the ETS-IMPRESS students that will help them excel in their chosen degrees and careers” says Adrienne Minerick, dean of the School of Technology.

In year one of the project, 2017-2018, the program received 44 scholarship applications. Applications were received from six states, including Michigan, Wisconsin, California, Florida, and Hawaii. The ETS-IMPRESS management team reviewed the applicants’ materials and ranked them using a selection rubric. Nine were selected for the scholarship, five as first-year students and four as transfer students. Selected applicants include one African American, one multiracial, two female scholars, and students from multiple socio-economic backgrounds.

“I believe the ETS-IMPRESS scholarship will open doors to various opportunities for me. This program will make me more engaged around campus and within my major as well as cultivate new skills in myself that will prove beneficial to me as I enter the workforce in the future.” Tierra Kelley – Electrical Engineering Technology
LT. DON MAKAY ’99

Michigan Technological University Alumnus Don Makay led the world’s largest and oldest parade on March 17, 2018, the New York City St. Patrick’s Day parade. Don Makay led the parade for the second time including the 69th Infantry. “It is an honor to lead the soldiers of the 69th, who not only represent a diverse group of young men and women who have volunteered to defend the country, but represent a long-standing tradition of immigrants who came, built this country, and were willing to fight and sacrifice for this country.”

The 69th Infantry formed in 1848 as a New York State Militia regiment (now part of the New York Army National Guard and the second oldest surviving Army regiment), of entirely Irish descent. They began providing military escort for the parade in 1853 and the regiment has continued to lead each year. Makay says the group, while no longer all Irish, includes many immigrants, with soldiers coming from across the world to serve and protect the United States.

A 1999 Michigan Tech graduate, Makay received his bachelor’s degree in Scientific and Technical Communication and an associate degree in Electrical Engineering Technology. He was a member of Michigan Tech’s Army ROTC and says that was a life-altering opportunity.

“It not only surrounded me with great leaders, it inculcated a sense of values and allowed me to hone and cultivate leadership traits at a young age. Michigan Tech gave me an opportunity to practice the art of leadership, which was crucial in preparing me for the demands that were soon to follow.”

When the 9/11 terrorist attacks occurred, Makay and his fellow soldiers were quickly put to the test. “Many of the lessons and examples I learned during ROTC set the stage for a very demanding requirement to lead troops.”

Makay’s Michigan Tech education and time at ROTC shaped his career path. “Michigan Tech has one of the best ROTC programs and the most challenging academic environments,” he says. “The leaders I met at ROTC saw my potential and they were talented at challenging me to do my best.”

His Michigan Tech experience helped to prepare him for his first job after graduation: platoon leader of 40 soldiers in the 101st Airborne Division in Fort Campbell, Kentucky. “We prepared for and deployed to Kosovo, a province of old Yugoslavia that had been struggling against a tyrannical regime, ethnic cleansing, and a revolution. My job was to help reduce violence and enforce peace in the villages we were assigned, which included military operations in the mountains on the border of Macedonia to stop smuggling, and peace enforcement in the villages.”

Throughout his tours of duty, Makay says his biggest career highlight has been to “fight for what I believe, to perform my duty, and lead soldiers during this difficult time. Politics aside, the fight of our generation was the fight against terrorism, and the highlight was simply to serve when needed.”

Makay also is the recipient of the 2018 Humanitarian Alumni Award. He received the award for his work to create the Iraqi Hope Foundation in 2008. Makay says the program is in the re-planning stages and he is excited about the future of the “Serve first, then talk.”

2018 and 2019 Program Scholar Awards

The 2018 and 2019 Program Scholar Awards were given to the following students (2018 students are pictured):

- Surveying Engineering: Kyle Hiltunen and Steven Smendzuik
- Mechanical Engineering Technology: Frances Luo and Alyssa DePauw; Isai Jonatan Hudy-Velasco
- Construction Management: Brandon Taavola and John Batsikouras
- Computer Network and System Administration: Michael Dabish and Dina Falzarano
- Electrical Engineering Technology: Thomas Prica and Spencer Thompson

Thomas Prica (EET) was also selected from the above program scholars as the nominee for the University’s 2018 Departmental Scholar Award and Isai Jonatan Hudy-Velasco (MET) was nominated for the University’s 2019 Departmental Scholar Award.
His advice for current and future students: “Life is not inherently fair or easy. It is made so by people who are willing to fight for it. If life seems fair or easy, do not take it for granted. Someone, somewhere is fighting to keep it that way. If you want to make the world a better place, serve something bigger than yourself. Serve first, then talk.”

LT. DON MAKAY ’99 (pictured, far left) was selected as the 2018 recipient of the Michigan Tech Alumni Board of Directors Humanitarian Award. Makay is a 1999 graduate of both the Electrical Engineering Technology and the Scientific and Technical Communication programs. This award is bestowed upon alumni of Michigan Tech by the Alumni Board on behalf of the University. It is presented to those alumni who, through their outstanding involvement and dedication, have made a significant contribution of volunteer leadership or service which has improved or enriched the lives of others and the welfare of humanity, and whose accomplishments reflect admirably on or bring honor to their Alma Mater.

The award committee recognized Makay’s outstanding commitment to his work with the Iraqi Hope Foundation which was dedicated to the stability and prosperity of Iraq through investment in private, small and mid-sized businesses and entrepreneurs.

Top Research Expenditures

THE ELECTRICAL ENGINEERING TECHNOLOGY’S FACULTY are involved in numerous research projects throughout the school year. In 2018, Dr. Aleksandr Sergeyev was listed amongst those faculty having the top research expenditures at Michigan Tech. Sergeyev has organized and moderated two sessions “Industry and Academia Collaboration in Robotics and Automation” and “Curriculum Development in Robotics and Automation” at the 2018 ASEE Conference for Industry and Education Collaboration (CIEC) for the Engineering Technology Division. The session on “Industry and Academia Collaboration in Robotics and Automation” was recognized at the 2019 ASEE CIEC conference and received the Best Session Award.

THOMAS PRICA (EET) received a $1,000 scholarship from the Michigan Association of Broadcasters Foundation (MABF) in 2019.

JOSEPH MAYROSE (EET) received a $1,000 scholarship from the Michigan Association of Broadcasters Foundation (MABF) in 2018.

HEATHER HARRIS (EET) and LEE HECKEL (EET) were inducted into the Epsilon Pi Tau Honor Society in 2019, which is the international honor society for professions in technology, recognizing students and technology professionals for academic excellence.
PROGRAMMABLE LOGIC CONTROLLER (PLC) is an integral part of nearly all of today’s industrial processes. A PLC is a digital computer used for automation of electromechanical processes and is designed for multiple input and output arrangements, extended temperature ranges, immunity to electrical noise, and resistance to vibration and impact. The most up-to-date PLCs have endless functionality, including programming using functional blocks, multitasking, and communication capabilities, and therefore are widely employed by the industrial sector. It is also very common that PLC systems are integrated with robotic solutions to enhance automation processes. As a result, the skills of newly employed industrial workers must include the knowledge of PLC, controls, and robotics. In addition, the knowledge of integration of all these tools in one efficient automated process suiting the requirements of modern industrial environment is crucial.

Michigan Technological University prepares the graduates with the skill sets which are up-to-date and relevant to the modern technologies widely employed by the modern industrial world. We strive to train our graduates on the most up-to-date laboratory equipment so they can implement their knowledge starting from day one once employed. Michigan Tech collaborates with NUCOR Steel to update the currently outdated PLC laboratory with state-of-the-art equipment with the goal of providing our students with the best training solution possible. The EET program at Michigan Tech currently offers two PLC courses: EET 3373: Introduction to Programmable Controllers and EET 4373: Advanced Programmable Controllers. The Electrical and Computer Engineering (ECE) department offers EE3261: Control Systems and EE 4262: Digital and Non-linear Control. The EET courses have a significant lab component and stress hands-on use of PLCs, while ECE courses...
Amatrol 990-PAB53 Portable PLC Learning System

The 990-PAB53 Portable PLC Learning System, shown, provides a comprehensive curriculum and application workstation that teaches modern PLC systems as they are used in industry today. Students learn both basic and advanced applications using the powerful Allen-Bradley CompactLogix 5300 PLC, a PanelView Plus terminal, and networks throughout the curriculum. The 990-PAB53 System comes with a mobile carrying case, workstation mounting panel, master control relay circuit, Allen-Bradley CompactLogix 5300 Programmable Controller, RS Linx and RS Logix 5000 software, a PanelView Plus terminal, an Ethernet Switch, I/O Simulator, five application circuits, student curriculum, instructor’s assessment guide, and installation guide. Learners will study industry relevant skills, including how to operate and program PLC systems for a wide range of applications. The 990-PAB53 Learning System enhances learning by featuring a wide array of real-world applications to allow students to actually see their programs control real systems.

Simulator, five application circuits, student curriculum, instructor’s assessment guide, and installation guide. Learners will study industry relevant skills, including how to operate and program PLC systems for a wide range of applications. The 990-PAB53 Learning System enhances learning by featuring a wide array of real-world applications to allow students to actually see their programs control real systems.

have more of a mathematical flavor and also include a lab experience. The new lab facility would allow EET 3373 and EET 4373 to be revised and enhanced to make the courses appropriate for both ECE and EET students. Students from both disciplines would benefit from using the most current PLC technology and would have the opportunity to interface the PLC’s with a new and much expanded set of digital and analog devices that are used in industry. In addition, the new equipment will allow us to develop industry-relevant learning materials, and provide state-of-the-art knowledge and experience to students utilizing the facility. This knowledge and experience will result in a well-educated graduate with practical hands-on experience designing, configuring, and troubleshooting industrial control systems, with an obvious benefit to employers of these graduates.
WHAT’S NEW?

New Faculty in Electrical Engineering Technology

DR. ZAKARIYA AL HAMOUZ joined the Electrical Engineering Technology faculty as a lecturer. He earned a PhD in Electrical Engineering from King Fahd University of Petroleum and Minerals in Saudi Arabia.

Al Hamouz comes to Michigan Tech from the University of Central Florida where he was a visiting scholar. He has held teaching positions at King Fahd University of Petroleum and Minerals, American University of London and AnNajah National University, Nablus, Palestine.

In addition to teaching a variety of electrical engineering courses, Al Hamouz has supervised more than 32 Capstone Projects for 120 students. Research interests include energy storage and electric vehicles, analysis and diagnosis of electric machines, power system planning and operation, and computational electrostatics.

DR. PANIZ KHANMOHAMMADI HAZAVEH joined the Electrical Engineering Technology faculty as a lecturer. She earned her PhD in Electrical Engineering from Michigan Technological University and her BS in Electrical Engineering from Sahid Behesti University in Iran.

Hazaveh has taught Introduction to Circuits and Instrumentation at Michigan Tech. She also taught high school mathematics and physics in Iran.

New Funding

DR. NASSER ALARAJE is the principal investigator on a project that has received a $999,483 grant from the National Science Foundation. The project is entitled: “Engineering Technology Scholars—Improving Retention and Student Success (ETS-IMPRESS).”

Management team on the project include: Dr. Guy Hembroff (CNSA), Dr. Mohsen Azizi (EET), Dr. John Irvin (MET), Dr. Aleksandr Sergeyev (EET), and Dr. Lorelle Meadows (Pavlis Honors College). This is a five-year project.

New Research

ENGINEERING TECHNOLOGY SCHOLARS—IMPROVING RETENTION AND STUDENT SUCCESS (ETS-IMPRESS)

Investigators: Dr. Nasser Alaraje, PI, Program Chair, Electrical Engineering Technology;
Dr. Mohsen Azizi, Co-PI (EET); Dr. Guy Hembroff, Co-PI, Director of Medical Informatics; Dr. Lorelle Meadows, Co-PI, Dean, Pavlis Honors College
Sponsor: National Science Foundation

UNIVERSITY COMMUNITY COLLEGE AND INDUSTRY PARTNERSHIP: REVAMPING ROBOTICS EDUCATION TO MEET 21ST CENTURY WORKFORCE NEEDS

Investigators: Dr. Aleksandr Sergeyev, PI (EET), Dr. Nasser Alaraje, Co-PI (EET), Dr. Scott Kuhl, Co-PI (CS)
Sponsor: National Science Foundation
EET Senior Design Highlights

THE CAPSTONE PROJECT is an intrinsic part of the undergraduate education. Capstone Projects are widely regarded as an excellent mechanism for assessing the outcomes of engineering and engineering technology programs and can serve as a direct measure of the quality of graduates. Capstone Projects provide an opportunity for students to demonstrate their critical thinking skills, communication skills, as well as time and project management skills.

In this Senior Design Capstone Project, the design, construction, and results of a low-voltage, low-current 3-phase lab bench was studied. The potential for a lab bench that is more user friendly, but still provides the user with practical, real world experience was also reviewed. The current laboratory equipment that is used to teach the Electrical Machinery course is outdated and unsafe. Their proposed solution provided an increase in the functionality and safety for learning concepts of 3-phase power systems. The construction of the device was documented with a high level of detail and provided a list of all the necessary components needed to replicate the proposed in this article system. The final design of the system was tested with the newly written labs so that the potential of the unit could be visualized.

New Articulation Agreements

Bay de Noc Community College, Escanaba, Michigan

The EET program established an articulation agreement with Bay de Noc Community College. Students in good standing who have earned an Associate’s degree at Bay de Noc Community College and have at least a 2.75 on a 4.00 scale will be admitted to Michigan Tech’s Electrical Engineering Technology program.

Yanbu Industrial College (YIC), Saudi Arabia

The School of Technology signed an articulation agreement with Yanbu Industrial College (YIC) in Saudi Arabia. The intention is for students to complete their first two-year equivalent component at YIC and then complete senior-level studies (generally 2 1/2 years of full-time academic enrollment) at Michigan Tech to obtain a Bachelor’s degree from Michigan Tech in a respective program: Electrical Engineering Technology; Mechanical Engineering Technology; Surveying Engineering (effective: January 2018 and for five years).

Peggy Gorton Receives “Making a Difference” Legacy Award; Two Other Staff Honored

PEGGY GORTON has built a legacy within the University, the School of Technology, and Geological and Mining Engineering and Sciences (GMES) over her 40+ years of service. During alumni weekend this last August, an alum returning to GMES worked to track down Peggy because she had been such a positive and encouraging force for him. She has helped students find places to live and provided lunches and snacks out of her own pocket.

In addition to Gorton, two other School of Technology staff members were nominated for awards. Pammi Washuleski, Office Assistant and Nicholas Hendrickson, Operations/Facilities Supervisor of the Machine Shop, were nominated in the categories “Serving Others” and “Above and Beyond” respectively.
Dear Alums, Friends, and Students:

IT IS A PLEASURE to share with you a brief selection of the news and accomplishments from our students and faculty in Electrical Engineering Technology. As a new Dean, it has been an honor to learn from and become a member of this community that is so dedicated to the professional, technical, and social development of our students to graduate into the changing needs of industry.

We learned in December that the administrative reporting structure for the Electrical Engineering Technology program will move to the new Computing College and will update its name to Mechatronics, Electrical, and Robotics Engineering Technology (MERET) to enable a central focus on Robotics and Mechatronics. EET will be co-hosting a new Master’s degree in Mechatronics (pending final approvals). This transition will occur over summer 2019 and is being planned to be seamless for the students.

As our program continues to grow and gain prominence, we hope you will partner with us in a way that is highly personal and meaningful to you (scholarships, lab equipment, internship experiences, virtual tours of your facilities, safety modules, etc.) and that has a significant impact on student development.

Feel free to reach out to us. We would love to hear and learn from you!

Best Regards,

Adrienne Minerick
Dean, School of Technology

RELATED ACCREDITED PROGRAMS

COMPUTER NETWORK AND SYSTEM ADMINISTRATION
  Computing Accreditation Commission (CAC) of ABET

CONSTRUCTION MANAGEMENT
  American Council for Construction Education (ACCE)

MECHANICAL ENGINEERING TECHNOLOGY
  Engineering Technology Accreditation Commission (ETAC) of ABET

SURVEYING ENGINEERING
  Engineering Accreditation Commission (EAC) of ABET