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2019

## Mechanical Engineering Technology Newsletter 2019

Department of Manufacturing and Mechanical Engineering Technology, Michigan Technological University

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# MECHANICAL ENGINEERING TECHNOLOGY

ACCREDITED BY THE ENGINEERING TECHNOLOGY ACCREDITATION COMMISSION (ETAC) OF ABET, ABET.ORG



## WHERE RACING WILL TAKE HIM

*Justin Mondeik can't be sure, but he's  
eager to follow the road.*



JUSTIN MONDEIK, PICTURED WITH HIS CAR

MECHANICAL ENGINEERING TECHNOLOGY student Justin Mondeik was featured in the article "Where racing will take him, Justin Mondeik can't be sure, but he's eager to follow the road" in the Milwaukee (Wisconsin) Journal Sentinel. Mondeik is one of seven regional-level drivers in the Kulwicki Driver Development Program competing for a career advancement stipend of more than \$54,000.

To look at Mondeik's racing schedule, you'd think maybe he was born more than a generation too late.

Dick Trickle, who was from

Mondeik's part of the state, made the rounds like this in the 1970's and '80s. So did Alan Kulwicki and Jim Sauter and Joe Shear, and later Rich Bickle and a few others.

That doesn't happen much these days. But for Mondeik, a 21-year-old college student from the unincorporated burg of Gleason – between Wausau and Rhinelander – this current eight-day odyssey makes perfect sense.

He spent seven days and nights at the track, at two local speedways where he competes weekly, on two regional touring series and in two special events.

"If you didn't have a full-time job,

*Continued on page 2*

## Irwin Wins Center for Teaching and Learning Instructional Award

DR. JOHN IRWIN, Professor and Program Chair, Mechanical Engineering Technology, was awarded the 2018 Curriculum Development and Assessment Award by the William G. Jackson Center for Teaching and Learning.

Irwin was recognized for his experience improving student learning through evaluation and assessment methods used in the classroom, leading accreditation efforts within his discipline, and as a leader in advancing University Assessment.

Irwin has been principal investigator on two Michigan Department of Education projects to improve teacher quality through the Educator's Professional Development Institute Series, which focuses on topics in the physical sciences, and was co-PI on another MDE project, serving as internal evaluator.



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**Graduates receive  
excellent job offers  
and great starting  
salaries as they  
enter their careers.**

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## WHERE RACING WILL TAKE HIM

*Continued from page 1*

this could be your job," Mondeik said at Slinger Speedway during a test day for Tuesday's Slinger Nationals.

Oh yeah, there's that. Mondeik's full-time job. He is fortunate his employer and primary sponsor are one and the same – AGRA Industries in Merrill – which provides understanding other jobs might not. He was on vacation the week of the race.

"Forty-some races throughout the year and we don't have one off week," said Mondeik, who will be a senior in Mechanical Engineering Technology at Michigan Tech. "We have at least one race a week from the beginning of May to the end of October.

"I've definitely got to go back to school right after Labor Day, but the local tracks I run for points, their points nights are done, and then the specials in September and October, those are all Saturday and Sunday shows. Definitely got to finish this out right."

Mondeik operates out of a modest trailer, and his white-and-orange car wears the scars of many a short-track battle. But he's not out to win "best of show." His goal is to continue to progress in racing and see where it might lead.

A former snowmobile and kart racer, Mondeik moved onto asphalt

ovals at 16, and won the title at State Park Speedway in Wausau in his first year in limited late models. Now he races in the super-late model division at State Park and at Golden Sands Speedway in Plover, as well as

### **"Forty-some races throughout the year and we don't have one off week"**

with the TUNDRA Super Late series and ARCA Midwest Tour.

Shut out in 38 races last season, Mondeik has won twice this year at State Park and has finished among the top five in more than half of his races.

"We're definitely going out and running with different competition all over the Midwest, different series, big fields of cars, and we've been running really good," Mondeik said. "That's the difference right now, and we're definitely going to follow that path, I think."

For the second consecutive year, Mondeik is a finalist in the Kulwicki Driver Development Program, one of seven local- and regional-level drivers from across the country competing for a career advancement

stipend of more than \$54,000.

In addition to their on-track performance, the finalists are judged on their ability to help uphold and spread the legacy of Kulwicki, the late 1992 NASCAR champion from Greenfield. Kulwicki received his engineering degree from UW-Milwaukee, was successful on the regional short-track scene and then made his way in NASCAR with his smarts and dedication.

Among his other projects, Mondeik has raised money to send seven veterans on Honor Flights to the memorials to their respective wars in Washington, all in Kulwicki's name.

While Kulwicki's story has been an inspiration to Mondeik, so has that of Ty Majeski, the first winner of the Kulwicki scholarship in 2015. Majeski, of Seymour, is using his engineering education while working for Roush-Fenway Racing as well as driving part-time in the NASCAR Xfinity Series.

"Ever since he won the Kulwicki Cup, it's really skyrocketed his racing career," Mondeik said. "That's what the whole Kulwicki program is about-to get you to that next step in racing.

"Hopefully we'll continue a similar path, and hopefully it works out good for us."

## **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.



**2018 PROGRAM SCHOLARS**

## 2018 Bob Mark Business Model Competition Winner in Mechanical Engineering Technology

STUDENTS RUSSELL CROFTON (Mechanical Engineering Technology) and Gary Tropp (Computer Network and System Administration) were amongst the winners in the 2018 Bob Mark Business Model Competition held on the Michigan Tech campus in December.

There were more than 20 participants making up 15 teams from various majors and disciplines who pitched to a panel of judges.

Ideas ranged from hypothermia-preventing life jackets to a web-based stress management program. Participants had five minutes to pitch their ideas and present their business model. The judging panel then had time following the presentation to ask questions and provide valuable feedback.



RUSSELL CROFTON AND SCHOOL  
OF BUSINESS AND ECONOMICS  
DEAN DR. JOHNSON

The Bob Mark Business Model Competition is part of Husky Innovate, a series of workshops and competitions that guide students through key phases of business development while emphasizing strategies for success.

## Five MET Students Inducted into Epsilon Pi Tau Honor Society

NINE STUDENTS were inducted into the Michigan Tech Delta Zeta Chapter of Epsilon Pi Tau Honor Society, Spring 2019. Epsilon Pi Tau is the international honor society for professions in technology, recognizing students and technology professionals for academic excellence. The student chapter of Delta Zeta Epsilon Pi Tau was recently selected as the recipient of the 2019 Warner Chapter Award for Region 3.

### Spring 2019 Delta Zeta–Epsilon Pi Tau MET Initiates:

- Anna Connelly
- Isai J. Hudy-Velasco
- Timothy Ingram
- Justin Mondeik
- Taren Odette



MET STUDENTS HAD GREAT SUCCESS IN PASSING THE FUNDAMENTALS OF ENGINEERING (FE) EXAM taken during their final fall or spring semester. The FE is usually the first step towards becoming a professionally licensed engineer.

The exam is for recent graduates and students who are close to finishing an undergraduate engineering degree from an ETAC/ABET accredited program.

Results from the fall 2018 FE exam showed 14 out of 21 students passed with a 67% rate—the highest ever obtained in MET.

### Topics covered:

- Computational Tools
- Dynamics, Kinematics, and Vibrations
- Electricity and Magnetism
- Engineering Economics
- Ethics and Professional Practice
- Fluid Mechanics
- Heat Transfer
- Material Properties and Processing
- Mathematics
- Materials
- Measurement, Instrumentation and Controls
- Mechanical Design and Analysis
- Mechanics of Materials
- Probability and Statistics
- Statics
- Thermodynamics



# SENIOR DESIGN PROJECTS

Mechanical Engineering Technology students complete a Senior Design Project that brings together all of the knowledge and skills they have learned. Many projects are funded by industry partners and students are often charged to develop a working prototype. Senior Design is two semesters and culminates with a final paper and presentation.



## VAWT Blade Redesign

Outside the south entrance of the Michigan Tech Rozsa Center stands a vertical axis wind turbine (VAWT). The advantage of the VAWT design is that the blades rotate regardless of wind direction, making them ideal for residential locations. The current VAWT is stationary even on windy days. The team designed, tested, and manufactured new blades for installation.

## ATS Chemical Safety Cart

Michigan Tech needed a better way to transport chemicals across campus. The carts were too heavy and didn't handle obstacles safely. The team's new cart allows users to safely transport chemicals across campus in accordance with Michigan OSHA requirements and Michigan Tech's University policy. The cart includes a dead man braking system, so the cart stays in place when left by the operator, and treads that provide better traction on snow.



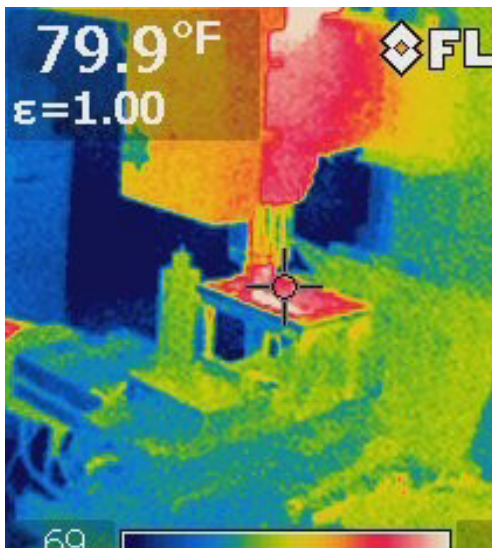


## Electric Powered Velocipede (EPV)

The EPV is an electric mid-drive full mountain bike that retains full suspension and gear selection while allowing the bike to be completely modular. The EPV is able to operate both off and on the road. The frame is chromoly steel (built in-house) and uses a Milwaukee battery to power the electrical drive system.

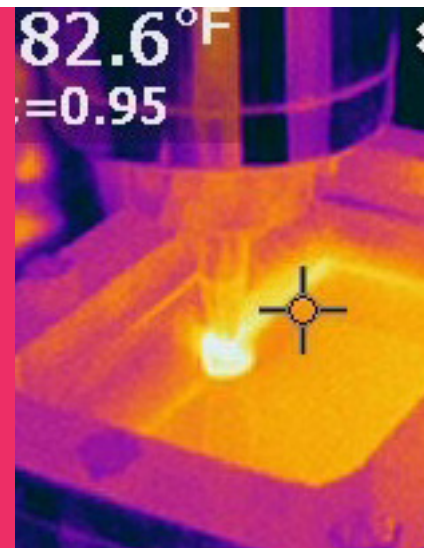
## Hovercraft

MET intends to use the hovercraft as an example of fluid dynamic principles in a lab setting. Due to thrust and drive control issues, the original hovercraft model was in need of new and updated parts. The team focused on driver safety and made general improvements to the hovercraft to achieve their project's end goal within time, money and performance constraints.



## Multi-Point Incremental Forming

The team used a three-axis CNC mill to form sheet aluminum. The aluminum is held in a fixture and formed downward using incremental steps. Spinning the tool along a tool path was used to finish a pocket of a milled part. The overall goal of the project was to achieve the best surface finish and the deepest draw of the part.





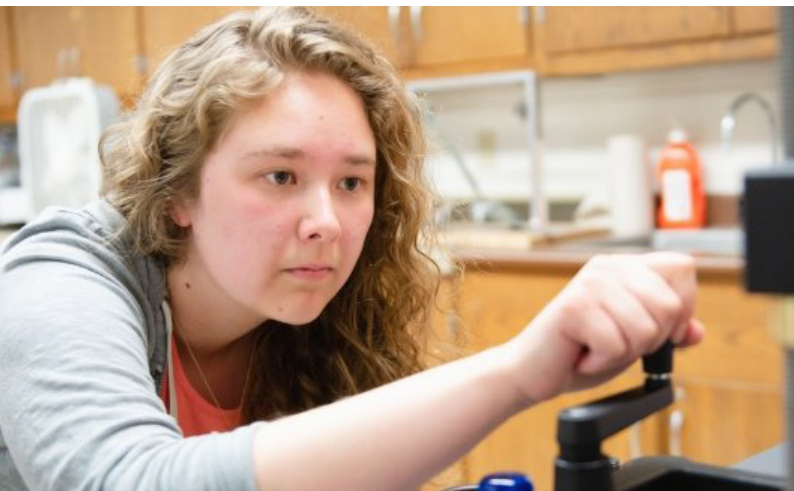
# WHAT'S NEW?

## New Research 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)."

Co-PIs on the project: Dr. Guy Hembroff (CNSA), Dr. Mohsen Azizi (EET), Dr. John Irwin (MET), and Dr. Lorelle Meadows (Pavlis Honors College). This is a five-year project.

**DR. SCOTT WAGNER** is the principal investigator on a project that has received a \$12,500 research and development grant from Michigan State University. Michael Morley is Co-PI on the project titled "Self-Lubricating Bearing Prototype Using Novel Friction Stir Powder Metallurgy Process." This is a 15-month project.



**GRANT RECIPIENT KAREN HELPPI (MET) DEMONSTRATES CALIBRATING A TEST MACHINE IN THE MATERIALS TESTING LAB.**

## New Faculty in Mechanical Engineering Technology



**MR. KEVIN JOHNSON** joined the Mechanical Engineering Technology faculty as an instructor. Johnson earned master's and bachelor's of science degrees from Michigan Tech and is currently a PhD student. He has several years of experience at Michigan Tech as a research engineer/scientist.

Johnson has 20 years of industry experience as a professional engineer at several Upper Peninsula companies including Pettibone/Traverse Lift, Blizzard Corporation, Somero Enterprises, and Lake Shore Systems.



**DR. DAVID LABYAK** joined the Mechanical Engineering Technology faculty as an assistant professor. He earned his PhD in Mechanical Engineering-Engineering Mechanics from Michigan Tech.

Previously, Labyak served as a part-time instructor of Mechanical Engineering Technology at Michigan Tech. As senior engineer and facility security officer at Great Lakes Sound and Vibration of Houghton, Labyak served as the lead analyst for all finite element analysis related projects among several other duties.



## New Minor in Manufacturing Systems to be Offered – Fall 2019

THE MINOR IN MANUFACTURING SYSTEMS provides manufacturing fundamentals and the option to elect up to six credits of courses related to automating manufacturing processes. Students will gain skills necessary for the design, set-up and troubleshooting of automated machinery for assembly, inspection and testing and/or robotic systems used to improve efficiency and safety. Skilled engineers with a background in manufacturing fundamentals such as lean, six sigma, production planning and safety along with knowledge of automated control systems used to communicate between devices are necessary for industries such as chemical processing, steel manufacturing, or power generation.

The combination of MET manufacturing related courses with EET automation related courses will provide students the means to specialize in manufacturing with the skills necessary to integrate the electronics required to automate the processes.

## New MET Thermal-Fluids Lab Course Offered – Fall 2018

A NEW LAB COURSE, MET 4360 Thermal-Fluids, was developed for combining Fluid Mechanics, Thermodynamics and Heat Transfer. Activities utilize industrial-like examples for students to practice verification of computational methods.

## AROTC Cadets Commissioned at Fall 2018 Commencement



AMONG THOSE COMMISSIONED at Michigan Tech's Fall 2018 Commencement and Commissioning Ceremony on December 15, 2018 were:

- Second Lieutenant Aaron R. Crapsey, BS Construction Management
- Second Lieutenant Nicholas S. Schaefer, BS Mechanical Engineering Technology

The Army Reserve Officer Training Corps (AROTC) prepares you to become a second lieutenant and lead soldiers. It is a proud Michigan Tech tradition. AROTC history dates back to 1917, when every officer of the 1st Battalion, 107th Engineers, was a Michigan Tech graduate.

## 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.

## FACULTY, FALL 2018





# FROM THE DEAN

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 Mechanical 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 Mechanical Engineering Technology program would change to the College of Engineering to form a new department in Manufacturing and Mechanical Engineering Technology. The Machine Shop will remain managed by this program. EET and MET will be co-hosting a new Masters 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)

### ELECTRICAL ENGINEERING TECHNOLOGY

Engineering Technology  
Accreditation Commission (ETAC) of  
ABET

### SURVEYING ENGINEERING

Engineering Accreditation Commission  
(EAC) of ABET



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