ME Bulletin

News for Mechanical Engineering Majors

Vol. 55, No. 1 ME Advising Office • 2560 EB • 355-3338 Fall, 2017

PHOTO PROVIDED BY DR. REID BUSH

ME 497/MKT 420 competition winners! Megan Beisser, Kelly Patterson, Sophie Moss, Jake Wojnicki and Jason Sammut are shown with the judges Paul Jaques from MSU Innovation, and Kaitlyn Hassett, Angelica Wilson and Matt Ply, from General Motors. Read about their winning product on page 6.

Practice

by Professor Ron Averill, ME Associate Chair

There are many famous quotes about practice. For example, National Football League player and coach **Vince Lombardi** said,

"Practice does not make perfect. Only perfect practice makes perfect."

There are so many quotes about practice that you might start thinking practice is important. Let's explore this.

Have you ever given a speech or presentation and your mouth does not say what your brain is telling it to say? The speech sounded so great in your head, but when the words left your lips the message was not quite what you intended. I know this has happened to me.

We often prepare to give a speech or presentation by first thinking about what we want to say. In some cases, we might even write it down. But there is no substitute for actually saying out loud precisely what you intend to say during the event, and then practicing out loud many times. Somehow, thinking about what you want to say is not the same as saying it. Our ideas "sound" different when we say them out loud than when we think them. The execution of giving a speech requires live practice, even if that speech is a short answer to an interview question (hint).

Have you ever watched a football team practice? Even the simplest offensive plays are run over and over again. The play might first be introduced as x's and o's on the chalkboard during a team meeting. Then, a slow motion "walk-through" will happen a few times on the field to make sure that everyone knows what to do. But that's not enough. An offensive play is never called during a game unless it has been executed flawlessly in practice dozens, if not hundreds, of times at full speed. The execution must be precise, and the only way to achieve that is through repetition.

These ideas apply to classes, as well. An exam is like a performance. It is an opportunity to show what you know and can do. To perform well, it takes a lot more than "looking over" the material or "reviewing" the example problems. These steps can give you false confidence. Topics and solution processes might seem clear in your head, but they feel a lot less clear when you have to execute them on exam day.

When learning a new concept, process or skill, you may not know ahead of time which aspects are going to be the most challenging for you. It's better to discover these challenges early in the learning process, so you can focus on what is most important to you, on what will get you to the next level. In other words, personalize your training experience.

The best way to achieve this is by practicing over and over again. For example, solve different problems every day until they all start to look the same. This may require doing much more than the assigned homework problems.

If you're not bored with practice yet, then you haven't done enough of it.

ME Bulletin

The *ME Bulletin* is published twice a year (fall & spring) for sophomores, juniors, seniors, faculty, and staff of the Department of Mechanical Engineering. Photographs were taken by Craig Gunn unless noted otherwise.

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In This Issue

Deadline: Nov 17

Students Select Dr. Recktenwald for the 2017 Withrow Award!

PATRICIA MROCZEK

Dr. Leo Kempel, Dean of the College of Engineering, Dr. Geoffrey Recktenwald, and Dr. James Klausner, ME Chairperson

Professor Geoffrey Recktenwald received the 2017 Withrow Teaching Excellence Award last spring at a special awards luncheon and ceremony. He was presented with an inscribed plaque, a medallion, and a small stipend. Each year a committee consisting of student representatives from ASME and Pi Tau Sigma reviews nominations from ME juniors and seniors and makes the selection.

Dr. Geoffrey Recktenwald, ME teaching specialist, is described by many of his students as a professor who motivates them to put in the time and effort needed to be successful in class. Students enthusiastically declare, "He challenges us, but does not try to break us." He teaches with "enthusiasm that is hard to find, making sure that the concepts are understood so that everyone understands the material." He is passionate about his courses and his teaching. This is reflected in the comments of students who refer to him as "patient and caring." His interests do not stop at the equation or figure; he embraces the potential in each of his students demonstrated by the effort he genuinely makes for each individual in his classes. His students say that he sets all of them up to succeed and champions the high expectations he demands. By being thought provoking and fair, he "resonates, inspires, and drives one to succeed."

Dr. Recktenwald is a Michigan native with bachelor's degrees in mechanical engineering and physics from Cedarville University in Ohio. After receiving his Ph.D. in 2006 from Cornell University, he remained to teach engineering courses in the Department of Mechanical Engineering, Theoretical and Applied Mechanics, and Mathematics. In 2009 he began pursuing post-doctoral work at the University of Texas at Austin. He joined the MSU ME department in Fall 2013.

His areas of expertise include vibrations and stability, methods development, and modeling radiation transport. In addition to teaching and working with students, he is an avid skier and plays soccer and hockey. He also enjoys riddles and an occasional bridge game. This semester, he is teaching ME 391 and 461.

Tutoring

•The ME Learning Center in 1237 EB, has free mentors for ME 201, 222, and 361 at 6-10 p.m. on Sunday through Thursday.

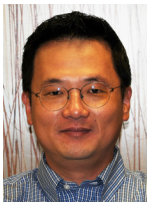
•The Guided Learning Center (GLC) in 1108 EB, offers free drop in tutoring in math up to differential equations, science courses (chemistry, physics, etc.), and many core engineering courses. To request assistance, go to: https://www.egr.msu.edu/dpo/sites/default/files/content/Application_for_Academic_Assistance.pdf

•The Cornerstone & Residential Experience (CoRe) program offers free tutoring in G24B Wonders Hall on Sunday through Thursday from 6 - 10 pm. This "drop-in" setting provides help for MTH 132 and 133; CEM 141 and 151; and PHY 183 and 184.

•ME graduate student and Pi Tau Sigma undergraduate tutors can be contacted through the ME Advising Office. These tutors charge a fee, which you can negotiate with them. If you are interested, email **Gaile Griffore** at griffore@egr.msu.edu

Department News

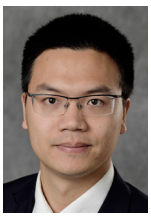
•**Dr. Patton Allison** has joined the ME department as an assistant professor. Dr. Allison received his Ph.D. from the University of Michigan in 2013. Most recently he has been a research associate at the Unviersity of Cambridge in the UK. His research interests include experimental studies of thermo-fluids and reacting flows, turbulent combustion physics, the development of non-intrusive laser diagnostics, alternative fuels in IC and gas turbine engines, and the improvement of computational modelling of combustion dynamics in practical devices. This semester he is teaching ME 440. Dr. Allison is passionate about cooking, mixology, and learning about food science. In addition, he enjoys travel and film. Read about Dr. Allison's research on page 8.



•**Dr. Haseung Chung** has joined the ME department as an assistant professor. Dr. Chung received his Ph.D. from the University of Michigan in 2005. Since then he has held research positions at the U of M. Dr. Chung's research is focused on additive manufacturing system development and optimization, cyber manufacturing; cyber manufacturing systems for open product realization; laser-induced material processing technology development and optimization; micro/nano machining, low-temperature polycrystalline Si technology, numerical model development of various thermal deformation phenomena; predicting bowing phenomena of thin Silicon solar cell, thermal deformation by injection molding process and IML, thermal energy network model development and energy usage optimization, heat transfer phenomena investigation numerically and experimentally, and innovative joining technology. This semester he is teaching ME 477. Dr. Chung loves most sports that involve playing with a ball, such as tennis, golf, basketball, soccer, etc. He is always trying to play these sports with his 7-year-old son.

•**Dr. Firas Khasawneh** has joined the ME department as an assistant professor. Dr. Khasawneh received his Ph.D. from the Duke University in 2010. He comes to us from the State University of New York Polytechnic Institute where he was an assistant professor since 2013. While there he started a new collaborative project with researchers at the University of Albany and MSU to explore the connection and advance the theory at the intersection of topological data analysis, dynamical systems, and machine learning; started a research program that investigates using topological data analysis for studying the time series of dynamical systems; and initiated a collaboration with a researcher in the Complex Systems and Nonlinear Dynamics group at Chemnitz University of Technology in Germany to study the stability of machining compliant structures. This semester Dr. Khasawneh is teaching ME 860. He enjoys traveling and biking. When he is not busy trying to avoid stepping on legos, Dr. Khasawneh also enjoys teaching his toddler about dynamical systems.

•**Dr. Zhaojian Li** has joined the ME department as an assistant professor. Dr. Li received his Ph.D. from the University of Michigan in 2015. His dissertation was entitled "Developments in Estimation and Control for Cloud-Enabled Automotive Vehicles." Since 2016 he has worked for General Motors Engineering propulsion Systems as a Multivariable Controls Algorithm Design Engineer. Dr. Li will be teaching ME 451 next semester. He enjoys playing basketball, tennis, and Chinese chess.



•**Dr. Himanshu Sahasrabudhe** has joined the ME department as an assistant professor. Dr. Sahasrabudhe received his Ph.D. from Washington State University in 2016. Since then he has been a LENS Applications Engineer/Scientist at Optomec Inc. in Albuquerque, NM. While there he conducted applied research and was responsible for the Laser Engineered Net Shaping (LENS) additive manufacturing process and LENS Print Engine (LPE) Hybrid Manufacturing process operations. Next semester he will be teaching ME 891. Dr. Sahasrabude likes to hike with his dog, and he enjoys jazz and rock music. He is currently learning to play the bass guitar.

Dr. Rodney Tabaczynski has retired from his position on the faculty. Dr. Tabaczynski received

his Ph.D. from MIT in 1971 and is a world authority on engines, engine modeling and engine system performance. He was director of Ford Powertrain and Vehicle Research Laboratory and a Ford Technical Fellow until his retirement from that company. In 2002 he was elected to the National Academy of Engineering, the most prestigious recognition offered to engineering leaders in the US. He joined the ME department in 2011 and has played an active role in the development of research programs in both the Mechanical Engineering Department and the College of Engineering.

Mr. Craig Gunn has become a Fellow in the American Society for Enginering Education (ASEE).

Dr. Like Li, teaching specialist, has left MSU and is now an assistant professor in the ME department at Mississippi State University.

Dr. Rebecca Anthony was presented with a $500,000 2017 NSF Career Award.

Academic Advising

1) **ME Juniors and Seniors** are advised by **Gaile Griffore**. For an appointment, call 355-3338, or go to 2560 EB.

2) **Sophomore juniors-to-be with a 3.1 GPA** are advised by **Gaile Griffore**. For an appointment, call 355-3338, or go to 2560 EB.

3) **Sophomores** who do not fit the criteria in number 2 above are advised by **Jeffrey Tsang**. Schedule an appointment with at online at: https://login.msu.edu/?App=Shibb-SSC-GradesFirst

4) **ME Freshmen** are advised in W-8 Wilson Hall on a walk-in basis only.

Dr. Lillehoj Receives the 2017 Withrow Distinguished Scholar–Junior Award!

PATRICIA MROCZEK

Dr. Leo Kempel, Dean of the College of Engineering, Dr. Peter Lillehoj, and Dr. James Klausner, ME Chairperson

Dr. Peter Lillehoj, an assistant professor in the Departments of Mechanical Engineering and Biomedical Engineering, and an adjunct professor in the Institute of International Health, has quickly established himself as an internationally recognized authority in the areas of BioMEMS, lab-on-a-chip and biosensors with applications toward mHealth, wearable sensing, and point-of-care testing since joining MSU less than five years ago.

Dr. Lillehoj was the first to demonstrate the use of a mobile phone for quantitative electrochemical measurements of disease biomarkers, which has opened up a new direction in mHealth technology. Additionally, his pioneering work in wearable sensors for biomolecular detection was recognized by a prestigious NSF CAREER Award in 2014.

Through a strong network of collaborators, both within and outside of MSU, his research has been acknowledged by the scientific community through publications in respected scientific journals, and invited talks at premier scientific meetings and universities. His recognition by the research community and professional societies has resulted in invitations to serve on proposal review committees for multiple funding agencies including NSF, NIH and The Wellcome Trust, and as a reviewer for top scientific journals such as the Proceedings of the National Academy of Sciences (PNAS) and PLOS ONE.

He has published eight journal papers in respected peer-reviewed journals, and five articles in peer-reviewed international conference proceedings in collaboration with his colleagues and students. In 2014, he was recognized with the Annals of Biomedical Engineering Award for Most Downloaded Article. His work has also been featured in various news media including *The Huffington Post*, CBS Detroit, Gizmodo, Bioscience Technology, Malaria.com, and others.

Teaching Award Nomination Form:

ASME

The Michigan State chapter of the American Society of Mechanical Engineers is a professional organization that strives to enrich the academic, professional and social lives of its members. ASME hosts company information sessions throughout the year where company representatives are invited to campus to discuss the functions of engineers within their organization and employment opportunities. This also gives students the chance to make connections with recruiters in an informal setting This semester, ASME has hosted information sessions with Dow Chemical, Black and Veatch, General Motors and DTE. General meetings are typically every other Tuesday at 6:30 p.m. ASME also provides members with events to connect with other engineering students through community outreach activities and social events.

The latest community outreach activity will be at Okemos High School on Tuesday and Thursday afternoons to facilitate engineering activities for the special education students. Later in the fall, ASME will be hosting a 3D Design Competition. More information on this competition will be announced. Upcoming events for the spring semester include the annual Broomball game and Junk Yard Wars. To connect with ASME or request additional information please visit the group's Facebook page, ASME at MSU. *Submitted by Megan Friedrich, Treasurer.*

COVER STORY

ME 497 / MKT 420 - Biomechanical Design Competition Winners! by Dr. Tamara Bush

ME 497-Biomechanical Design course and MKT 420-New Product Design & Development, co-taught by **Drs. Tamara Bush** and **Hang Nguyen**, give students a chance to integrate engineering, marketing, and entrepreneurship in a class design competition. The class focuses on design for rehabilitation for persons for disabilities. Representatives from General Motors participated in the design process by sponsoring a competition in the course, offering feedback to teams, and serving as guest judges during team presentations.

The National Science Foundation also provided support for this class for curriculum development and prototype costs.

Their winning product was the HEAT – Hand Extension Activity Tracker – to be used for hand rehabilitation after stroke.

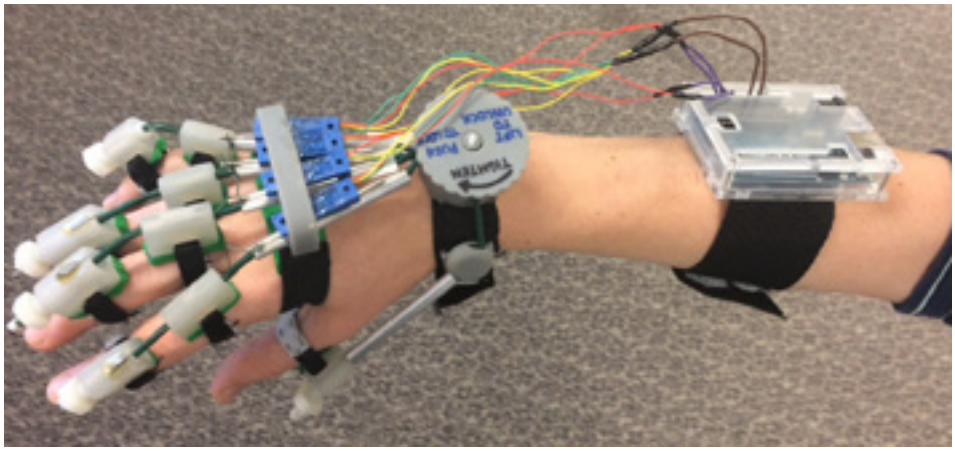


PHOTO PROVIDED BY DR. BUSH

The HEAT (Hand Extension Activity Tracker) assists stroke patients with finger extension while recording movement data to allow therapists to monitor patient rehabilitation.

GENERAL MOTORS

Deadline: Nov 17

Career Updates to See, as a Spartan ME!

by Kyle Liechty, Co-op/Intern Coordinator

SEELEY

Here is the semi-annual update from the world of careers,
There are many opportunities about, from computers to gears.
Handshake is full of job postings, events, and other fun gigs,
Opportunities are vast, from clean labs to oil rigs.

Companies like Consumers, Steelcase, Dow and BP,
Plus Tenneco and ZF would sure love an ME!
Be sure to apply, as applications may be expiring fast,
But the job outlook is great, based on our forecast.

While we're on Handshake, there are ways to enhance your account,
By filling out your interests, to narrow results, as job postings mount.
Make sure that you "favorite" employers, so you get their notifications,
You won't be able to miss them, whether you're here or on vacation.

Beyond the job applications, we have more updates to share,
Especially in co-op education, ME's are going everywhere!
From BorgWarner in Metro Detroit and Stryker in the Zoo,
To Tesla in Cali and Albemarle down in the bayou.

In addition to those, here are some options that have been such a hit,
Gallo Wines, BMW, Universal Studios, and NASA are all pretty lit.
Throughout the year, co-op hires continued to soar,
Over six-hundred thirty, but this year, we'll have more!

It isn't that bad to take off a semester or three,
Talk to the Spartan Co-op Advisory Council, they'll totally agree.
When you work in a job at such length and variety,
You'll have a much greater chance of having an impact on society.

When career fairs slow down and you are still looking for work,
There is no need to freak out, so please don't go all berserk.
Events will appear, such as ASK Sessions and mixers across the land,
Look for "Careers in Beers and Link in the D, for a couple we know offhand.

Continue to look and keep searching or help out a friend if you're already hired,
Use your connections and network to help get any position desired.
Even if the job search is stressful, you truly have nothing to fear,
Because at the end of the day, you're a Spartan Mechanical Engineer.

Curriculum News

Co-op Students: Before you leave for your Spring 2018 co-op rotation, be sure to discuss your schedule for next Fall 2018 / Spring 2019 with your academic advisor.

ME 481–ME Design Projects requires *department approval* before you can enroll. If you have an accurate long-term schedule on file in the ME Advising Office, request approval by submitting the ME 481 Approval Form: https://www.egr.msu.edu/me/me481-approval-form. If you do not have an accurate long-term schedule on file, schedule an appointment with Gaile by calling 355-3338 or stopping by 2560 EB. NOTE: May and August graduates who will have completed ME 471 and are at least concurrently enrolled in ME 410, may be eligible to take ME 481 next fall. Ask Gaile if you qualify.

Class Standing. ME juniors and seniors can obtain this information in 2560 EB. Sophomores should go to W-8 Wilson. Be prepared to show your MSU I.D.

Job Search Advice: The Center is available to answer questions about your job search. To ask a question or schedule an appointment, go to 1340 EB or call 517-355-5163. Or, email the office at: careers@egr.msu.edu

Prerequisites: The ME department expects all students, *including members of the Honors College*, to observe all course prerequisite requirements. If you have a question about prerequisites, contact the ME Advising Office.

Why Study Combustion?

Combustion is at the heart of many devices that touch our daily lives including candles, automobiles, jet engines, and gas burners for cooking, heating, and large-scale energy production. Even with the much-needed advancement of renewables, many devices will continue to depend combustion and fossil fuels for the foreseeable future. For example, gas turbine engines for commercial aviation will continue to operate on kerosene-based fossil fuels for the foreseeable future due to the high energy densities provided by jet fuels at low cost. It is imperative that, while fossil fuels continue to play a major role as an energy solution in our supply portfolio, research continues to focus on better usage, application, and fundamental understanding of combustion as a process.

Combustion science is the study of reacting flows and chemical processes involved in the consumption of fuel-oxidizer mixtures. It involves an incredibly complicated interplay between fluid dynamics and chemistry. Research in the combustion community spans a broad range of studies from elemental chemical reactions to jet engine performance and how to better implement these processes in practical devices.

Modern combustion science is ultimately about making combustors and engines more efficient and cleaner for the environment.

Dr. Patton Allison is a new assistant professor in mechanical engineering with a background in combustion and aerospace propulsion. He comes to MSU after postdoc work experiences at the University of Cambridge and Ohio

PHOTO PROVIDED BY DR. ALLISON

Swirl flames, at the heart of gas turbine combustion, improve fuel-air mixing and stabilization within engines due to high levels of turbulence and recirculation.

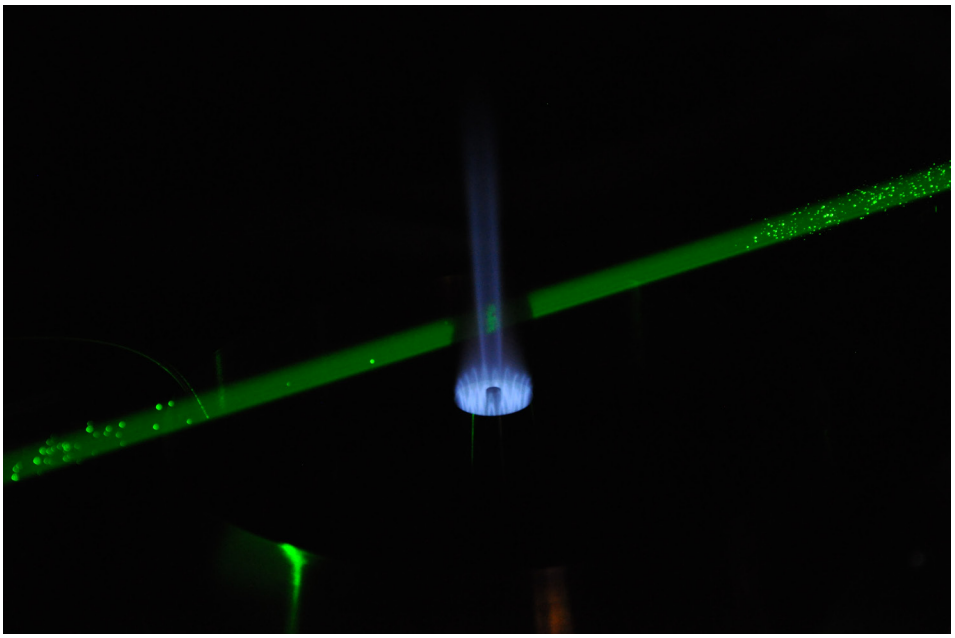


PHOTO PROVIDED BY DR. ALLISON

Laser diagnostics, such as Rayleigh scattering thermometry, can be used to determine gas temperatures and locate mixing layers in flames non-intrusively.

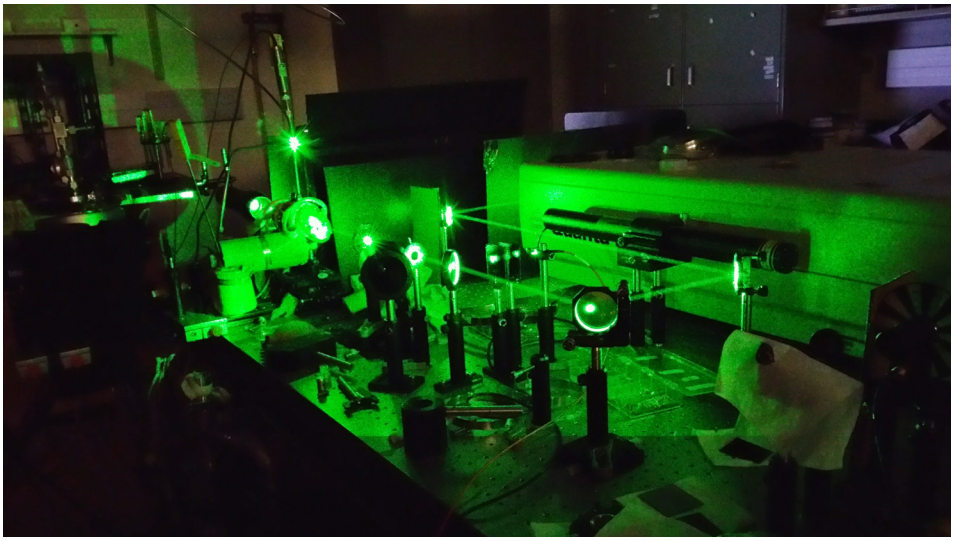


PHOTO PROVIDED BY DR. ALLISON

The structure and dynamics of flames can be imaged and studied with the application of optical and laser-based diagnostics in the visible to UV spectrum.

State. He completed his PhD at the University of Michigan. He is excited to be teaching ME 440 Aerospace Engineering Fundamentals, focusing on jet and rocket propulsion, this fall. Dr. Allison is developing the Advanced Diagnostics and Combustion Laboratory (ADCL) program focusing on laser diagnostics and reacting flow research at MSU. The ADCL will focus on fundamental and applied topics regarding both combustion in gas turbine and automotive engine relevant flows.

His primary research program will be based on the application and experimental combustion studies of real-world liquid fuels, particularly kerosenes and heavy hydrocarbon fuels. Reacting jet fuel sprays are complicated systems involving atomization, evaporation, fluid dynamics, and high temperature chemistry. Optical and laser-based diagnostics are used to study flame structure and dynamics, droplet effects, and interactions between turbulence, flames, and sprays. The ADCL wants to investigate transient and unsteady processes including ignition, blowout, and thermoacoustics, as well as lead the development of laser diagnostics tailored for use with liquid fuels. For more information, visit the ADCL website at www.pmallison.com

For all we know about fire and flames over thousands of years of experience, there's still so much to do and learn.

MSU – RWTH Aachen Program

by Prof. Brian Feeny, Program Director

College is a great time in life for trying new experiences, and a fantastic way to broaden your experiences is to take part in a Study Abroad program. Our exchange program with RWTH Aachen, Germany, provides a summer experience where you can work on an applied engineering project in an advanced facility, tour fascinating sites, savor European foods and beverages, soak in the ambiance of languages and culture, and meet new people. By doing a study abroad, you will get immersed in an environment with not just unique scenery, but where you can witness first hand different ways of meeting basic needs that are easily taken for granted.

MSU ME students with a 3.0 GPA or higher have the amazing opportunity to (a) live in Aachen, Germany (mid-May to end of July 2018), (b) earn 5 credits independent study plus 4 credits German language and culture, and (c) travel in Europe with planned 3-day weekends, i.e., the motto is "Work hard, play hard!" The experience will involve interaction with fellow engineering students from around the world at RWTH-Aachen, a premier European technical university. The city center is a blend of an old, historic European city and a modern college town. The superb rail system allows our students easy access to Munich, Paris, Amsterdam, Zurich, Rome, and many more destinations on their 3-day weekends. Those with a wanderlust for nature might consider places like Verndon Gorge in France, the Alps, Germany's Jasmund National Park, or Stromboli in Italy.

Note: Scholarship funds are available through the North American Rockwell Endowment.

Find out more! Watch for an announcement about an upcoming informational meeting. You can also contact me at feeny@egr.msu.edu or 517-353-9451. A great way to get more information is to talk to former exchange students. They enjoy sharing their experiences with the program. Let me know, and I can help you get in contact with former Aachen exchange students. Don't miss this opportunity!

Study Abroad in France (ECAM in Lyon)

by Professor André Bénard

The Department of Mechanical Engineering offers a month-long study abroad program for junior-level students in Lyon, France each summer. The students stay at ECAM, a French engineering school located in the old part of Lyon, for the entire month of June. Students can take the equivalent of ME 201 or ME 410, both taught in English. They also take a French language course (taught in French). If you are interested in this program, please contact:
Ms. Maggie Blair-Ramsey <blairram@egr.msu.edu> or
Professor André Bénard <benard@egr.msu.edu>

Study Abroad at the University of Edinburgh

by Gaile Griffore & Craig Somerton

Founded in 1582 the University of Edinburgh is one of Europe's finest universities with a great tradition of producing outstanding scholars, including such giants as **Charles Darwin** and **Sir Arthur Conan Doyle**. In engineering, there is **William John Macquorn Rankine**, who proposed both the Rankine cycle (primary in the operation of steam power plants) and the Rankine temperature scale (the absolute scale used in English units).

The mechanical engineering facilities are very modern, allowing the faculty and students to pursue research topics varying from wave energy to micro-fabrication.

The city of Edinburgh, whose downtown is a short bus ride from the university's engineering buildings, is listed as a World Heritage Site. In addition, for students seeking leisure activities the city has a terrific night life with many activities for young adults.

You will be able to take courses that fulfill your entire Senior Elective requirement (i.e., 12 credits of Senior Electives, including the 3-credit design intensive course). For more information, contact **Gaile Griffore**, ME Advisor, 2560 EB, 517-355-3338 (griffore@egr.msu.edu)

Deadline: Nov 17

Where Do You Stand in Relation to Other Undergraduate Engineers? by Craig Gunn, Director of Communications

If you think about that question, I would guess (and guess pretty well) that you are equal in knowledge to almost every other undergraduate mechanical engineering student across the United States and probably across the whole world at your level. Whether it be MIT or U of M or Western Michigan University or Stanford, the education that you have received is the same as other mechanical engineers.

Okay, so what is the purpose of this short 300 word article anyway? The purpose is simple. You need to be aware of how you will stand out from the crowd. How you will shine when others around you don't quite match the glow of your being. This can be accomplished with a good looking set of clothing, a new haircut, fresh deodorant, and shining teeth. That is obviously the LOOK. But one area that can really rocket you to the front of the line is the manner in which you communicate!

Do you speak with confidence. Do you make that riveting presentation that grips your audience so that they really believe what you say and understand that you are a master of your information? Now is the time to start to hone those skills that make you stand out. Let your voice be heard in every classroom, at every meeting, and in every situation that gives you a platform to be heard. Get comfortable with being under the microscope of the audience. Be that one speaker who wows the audience and gets them talking about how great it was to listen to someone who knows what he or she is talking about.

As a last note, now is also the time to start fine tuning those writing skills that may have lain dormant for a few years. Make every writing assignment an adventure in discovering how well you are presenting your information. This can be everything from a quick email to a lab report to a formal report at the end of the semester. Make every effort to think about your audience, the information you are presenting, and the words you are using to present it. Mechanical engineering should be your love. Communication should be your life.

MSU – Denmark (DTU) Program

Denmark is a tiny country that has some castles that can best be described as magical. This country of mermaids and Vikings as well as delightful pastries and lovely beaches can enchant any tourist, which is why people come here year after year in search of the many pleasures that a Scandinavian country has to offer. You will find something here that caters to every taste. Whether it's the Tivoli Gardens or the popular beaches that can be found in Legoland and no matter what your age is, there is plenty for you to enjoy in Denmark.

In 1829, when **Hans Christian Ørsted** founded what became the Technical University of Denmark (DTU), he created an eloquent response to an important need in society: to make use of scientific progress in the service of society by applying technology. DTU has applied this fundamental idea for the past 177 years. Based on intensive efforts in research, innovation and the transfer of knowledge, DTU has contributed to Denmark achieving a leading position within such diverse fields as design, wind energy, biotechnology, electronics and telecommunication. DTU thereby deserves a substantial share of the credit for Denmark being able, despite its modest size, to create and maintain a welfare society that is the envy of many nations. DTU, claims the role as a leading force within the technical and natural sciences seriously.

ME students may study Fall and Spring at The Technical University of Denmark in Lyngby, and courses are offered in English. They provide education, research and innovation at a high international level. This is a great study abroad opportunity for students at ME majors.

Undergraduate Program Educational Objectives Department of Mechanical Engineering Michigan State University

(Approved by the ME Department Faculty on December 10, 2015)

Our graduates will:

•Be competent and ethical engineers practicing in a diverse range of activities.

•Use their mechanical engineering education as a stimulus for personal and professional growth.

•Be recognized for their capability, creativity, and application of knowledge.

•Be independent and critical thinkers who identify problems and develop effective solutions.

Dean's List

Congratulations to these 530 ME majors who made the Dean's List after Spring and Summer 2017. To be on the Dean's List, you must have a semester GPA of 3.5 or better. This list is from September 22. For updates, go to: http://www.reg.msu.edu/ROInfo/GradHonor/DeansList.aspx

SPRING 2017: Christian Abbate, Sam Addy, Alec Adgate, Mitch Agrwal, Raid Alaswad, Ali Alhajji, Omar Alhammadi, Ahmed Alhosani, Shwan Al-Howrami, Jimmy Almacddissi, Mojtaba Almiskeen, Majed Almughair, Hadi Alnaji, Mohsen Al-Qamber, Naif Alzahrani, Timur Aminov, Tony Anason, Jon Andrejczuk, Scott Anthony, Matthew Arenz, Austin Aselage, Albert Asta, Alexander Athens, Ally Austin, Joseph Auty, Matthew Auvenshine, Sadab Bahar, Allison Bakka, Ryan Ball, Geoff Barfield, Cameron Barghahn, Connor Barker, Will Barrett, Tyler Bauder, Kyle Bauer, Payton Bauman, Lexi Baylis, Wyatt Beachy, Jenna Beauregard, Ben Beckas, Zach Becker, Chris Beeman, Madison Begin, Megan Beisser, Kyle Benedict, Marcell Benkes-Toth, Matt Bergdolt, Michael Bigelow, Zahji Billingslea, Frank Biondo, Niklas Boisten, Brenna Bolton, Will Book, Nick Borellis, Zach Borgerson, Jonathan Borgiel, Michael Bowen, Samuel Boyea, Zac Brei, Chris Brenton, Joe Brenton, Zachary Brokaw, Rourke Brummette, Abbey Bugenske, Adam Burnick, Morgan Burr, August Butzke, Cam Cabana, Alexander Caine, Caleb Calfa, Connor Campbell, Devin Cao, Kevin Carlson, Nathan Cascarelli, Sam Case, Oscar Castro, Caitlyn Cavicchiolo, Arya Chakraborty, Trevor Chamberlain, Brian Chan, Robert Chaney, Brad Chapman, Pranay Chaturvedi, Haoran Chen, Simon Chen, Yibin Cheng, Peter Chew, Martyna Cieslak, Sarah Clark, Sydney Clark, Stephanie Close, Austin Coha, David Cohle, Jeremy Coleman, Steven Collareno, Kalie Collins, John Conklin, Robert Cortese, Mira Crain, Cortney Craven, Luke Crompton, Evan Cummings, Emma Curd, Ethan Curtiss, Jenna Dalrymple, Connor Daly, Trevor Dame, Sarah Daugherty, Devon Davenport, Elizabeth Davidson, Craig Declerck, Delang, NickDepierre, Jacob Saleski, Jessica Derkacz, Muhammad Djafri, Angela Dobrzelewski, Andrew Dolenga, Brian Doyle, Evan Drew, Tyler Dubois, Carly Dugan,
Parker Dukus, Drew Dunker, Ben Dunklee, Sarah Egbert, Tanner Ellens, James Ellison, Rachel Emerick, Nathan Engler, Phillip Erickson, Christopher Fadanelli, Colton Fairbanks, Mike Falter, Ryan Fantin, Brian Fedewa, Paul Ferraiuolo, Brad Fischer, Brendan Fitzpatrick, Nicholas Flannery, Mathew Flegel, Jacob Flight, Zach Flowers, Matt Forsyth, Jake Fosmoen, Andrew Franko, Alexis French, Gregorio Gaio, Brittany Galliers, Pavitra Gangapur, Michael Geiger, Kayla Gibbs, Ryan Giere, Justin Gilgallon, Cristian Gilman, Reison Gjolaj, Tyler Gleason, Grant Gooch, Lindsay Goodrich, Samuel Greenwald, Demarcus Gregory, Marissa Grobbel, Tianyuan Gu, Charlie Guidarini, Rishi Gupta, Hunter Gvozdich, Neil Haakenson, Nathan Hadobas, Tecumseh Hakenjos, Jeffrey Hall, Humphrey Han, Tianyu Han, Tal Hanani, Lance Haner, Darren Harnden, Bradley Harris, Will Hartnagel, Eric Hausermann, Kyle Hawkins, Renjie He, Carly Head, Chris Heilman, Abigail Henning, Max Herzog, Mitchell Holt, Colin Horton, Hanyao Hu, Kevin Huang, Michelle Huang, Jill Hubbard, Ihn Hur, Rhylan Huss, Richard Hutchins, Reed Hylka, Jeffrey Ingell, Kory Iott, Ivan Iovtchev, Hana Irvine, Taylor Jacobs, Owen Jarl, Alex Jennings, Hunter Jenuwine, Adri Johari, Cj Johnson, Mark Johnson, Mike Johnson, Sam Johnson, Jessica Jones, Meredith Jonik, Suvir Josh, Nattida Jubju, Ryan Kalis, Muhammad Kamarudzaman, Tom Karbon, Jonathan Katt, Jacob Keller, Ross Kelly, Danielle Keusch, Kamal Khan, Do-Hyung Kim, Edward Kim, Hyang Kim, Logan Kincaid, Alex Kintner, Andrew Kistler, Kyle Klocko, Austin Klump, Sara Knoedler, Thomas Kobak, Jason Koberstein, Genevieve Kobrossi, Suhas Kodali, Patrick Korte, Jennifer Kozlowski, Austin Krauss, Jacob Krummrey, Zak Kubiak, Dean Kuharevicz, Niranjan Kulkarni, David Kumiega, Anthony Lafata, Chase Lamere, Andrew Lamkin, Mark Lapinski, Zack Lapinski, David Lawless, Matt Lawrence, Jack Leckner, Andrew Lee, Mark Leiman, Nathaniel Lewis, Jiayi Li, Rex Li, Eric Lindlbauer, Ian Lindsley, Huan Liu, Simon Liu, Yangzhe Liu, Zhan Liu, Sarah Lohman, Scott Lohman, Fanghan Lu, Jiajun Lu, Julia Lutz, Collin Lynch, Cody Lysher, Kaidi Ma, David Mackens, Maria Magidsohn, Shayne Maguire, Saul Makanga, Erin Maroney, Matt Marsh, Eric Martin, Mackenzie Martin, Abner Martinianobarbosajunior, Shaya Master, Brandi Mazzella, Michael Mcatee, Danny McCarty, Kevin Mccarty, Chris McGinnis, Danny McGrail, Nathan Mclean, Marissa Meaney, Trystan Melnyk, Josh Meyer, Zhaoqiang Mi, Jack Michalski, Noah Milberger, Brandon Miller, Helen Miller, John Miller, Robert Miller, Sophia Miller, Spencer Miller, Dante Minatel, Patrick Miyamoto, Ahmad Mneimne, Emily Money, Bradley Moore, Hunter Moore, James Moran, Alexandra Morford, Kanshu Mori, Nehemiah Mork, Morrice Morris, Nick Moscone, Ryan Mulka, James Mulkern, Taylor Mullahy, Radhika Murgai, Josue Natarenmoran, Shane Neal, Jake Nevin, Justin Ngo, Hai Nguyen, Hoa Nguyen, Tracey Nguyen, Yuchen Ni, Tyler Nicolay, Allison Nielsen, Mikayla Nitoski, Kathleen Noblet, Leah Nonis, Lucas Notarantonio, Stephen Oberheim, James Oconnor, Michael Okuniewicz, Hassan Olaiwat, Kyle Oliynyk, Ginnie Olszewski, Breanna Osborn, Garrison Osborne, Maria Osinski, Zachery Osisek, Emily Oswald, Jacob Overla, Nick Pak, Andrew Palucki, Cameron Papson, Bram Parkinson, Owen Parmeter, Kelly Patterson, Jeffrey Pattison, Evan Paupert, Jianyuan Peng, Vincent Pernicano, Kent Peterson, Sammie Pfeiffer, Trey Pfeiffer, Amanda Pfutzenreuter, Justin Piccolo, Brian Pieciak, Bill Pittman, Robert Pizzimenti, Carolyn Poleski, Mitchell Pollee, Mauricio Ponsmartinez, Michael Popielec, Matthew Pottebaum, Reed Potter, Michael Powers, Diego Prakash, Zixuan Pu, Matt Pusheck, Andrew Quang, Chase Quencer, Connor Quigg, Daniel Quinn, Parwesh Rallapalli, Max Ralya, Michael Rasmussen, Li Ren, Dominic Rende, Vince Rende, Becky Reneker, Michael Rettschlag, Andrew Retzlaff, Matt Rice, Adam Richards, Alyse Richards, Matt Rimanelli, Noah Rimatzki, Sam Rinke, Spencer Rinke, Matthew Rist, Justin Roelant, Vincent Rogers, Derek Roggenbuck, Brett Roginski, Winter Romeyn, Drew Roth, Taylor Ruelle, Armando Ruiz, Taylor Rush, Owen Ruster, Brendan Rybicki, Zachary Sadler, Michelle Samalik, Jason Sammut, Michael Sanchez, Matt Sarver, Jacob Schoenborn, Ethan Schrader, Kevin Schuett, Paul Schulman, Vasha Sedlacek, Zhongyu Shi, Jacob Sickelsteel, Richard Simon, Ryan Simon, Drew Skedel, Elizabeth Slifkin, Josh Smith, Tyler Smith, Thomas Smither, Josh Soyka, Jon Spiwak, Andy Stamm, Alex Stangeland, Kayla Starr, Eric Stauffer, Ryan Stawara, Jared Steen, Nick Stein, Conner Stevenson, Matt Strzalkowski, Jake Stuifbergen, Ruiwei Sui, Jeri Sutter, Abby Swasey, Caden Swindell, Sytsma, PaulCharlie Tappan, Jacob Templin-Fulton, Jordan Thayer, Josh Theis, Heidi Theisen, Spencer Thompson, Lars Thornton, Joel Todd, Frank Todem, Diamant Topllari, Connor Torpey, Jason Troppens, Tommy Tsuchiya, Brandon Twiehaus, Antonio Ulisse, Matthew Urdea,
Brian Valentine, Nick Van Oost, Michael Vanbemmelen, Gabe Vanhollebeke, Ethan Vassallo, Marc Veihl, Sivajyothi Vemulapalli, Ben Vitek, Dennis Volostnykh, Alex Vu, Jules Waelchli, Philipp Waeltermann, Amad Wahib, Brock Walquist, Connor Walters, Matthew Walz, Andrew Wandor, Philip Wandor, Wang, Binliang Wang, Lingfeng Wang, Wayne Wang, Xiaoke Wang, Yanze Wang, Zhenyu Wang, Bryan Warholak, Madeline Warner, Brent Weakland, Andrew Webb, Demetria Webster, Zaman Wehab, Garrett Weidig, Megan Weiss, Olivia Weprich, Stephen Wernette, Jonathan West, Jay Wideman, Nic Wiggins, Henry Wikol, Ashley Wilkey, Colby Williams, Leah Williams, Chase Wilterdink, Gabbie Wink, Chad Winner, Jake Wojnicki, Ross Wolniakowski, Kyle Woods, Zhiwei Wu, Hannah Wyatt, Joey Xie, Dong Yang, Jimin Yang, Jianan Yao, Junke Ye, David York, Che-Kuan Yu, Gabrielle Zapolnik, Connor Zehr, Austin Zeitler, Chengming Zhang, Hansheng Zhang, Zihan Zhang, Qilin Zhu, Paul Zhuang, Levi Zimmerman, Cody Zorn, Kris Zoto, Chizun Zou, Yifan Zou

SUMMER 2017: Ahmed Alblooshi, Alexander Athens, Yeeun Lee, Zhan Liu, Austin Miller, Zexi Peng, Brandon Twiehaus, Matthew Walz, Yanze Wang, Renchi Wei, Chengming Zhang

Deadline: Nov 17

95 Seniors to Graduate in December!

Congratulations to all mechanical engineering December graduates! On behalf of the ME faculty, I wish you the greatest happiness and success in your careers, graduate studies, and personal lives. The following students had applied for graduation by October 10. If your name is missing, please contact me immediately (Email Gaile at <griffore@egr.msu.edu> Tele: 517-355-3338).

Michael James Accettura
Raid Abdulla Alaswad
Manea Yousuf Alhammadi
Omar Ismail Alhammadi
Adnan Abdulkhaliq Alhuwait
Mohsen Al-Qamber
Bridget Mary Anderson
Jonathan Anthony Andrejczuk
Roobin Arbab
Alexander William Athens
Allison Renee Bakka
Biswas, Pronob
Joshua Evan Borton
Luke Austin Boulter
Ziqing Cao
Pranay Chaturvedi
Benjamin Paul Childs
Steven Michael Collareno
Kalie Noelle Collins
Evan Matthew Cummings
Muhammad Faiz Djafri
Angela Marie Dobrzelewski
Emily Kathleen Donohue
Tanner Lee Ellens
Zachary Ryan Engen
Paul Joseph Ferraiuolo
Megan Patricia Friedrich
Jacob Paul Flight
Christian Alan Genord
Yurun Gu
Hunter Charles Gvozdich
Darren Jonathan Harnden
Syunsuke Lewis Hata
Andrew C Hieber
Mitchell James Holt
Ihn Uyeb Hur
Rachael Elizabeth Kain
Cody Lane Kelly
Jacob L Khodl
Logan Kreg Kincaid
Thomas Michael Kobak
Douglas William Kubiak
Anxhelo Lalaj
Ruichen Li
Eric Matthew Lindlbauer
Jiajun Lu
Cody Michael Lysher
Eric Thomas Martin
Kevin Michael McCarty
Marissa Ashlyn Meaney
Jason Thomas Moll
Leah Jewel Mondro
Hai Manh Nguyen
Hoa X Nguyen
Austin Phillip Nicholsen
Laura Alison Nye
Thomas Michael Obrien
Michael Peter Okuniewicz
Hassan Ali Olaiwat
Melissa John Oudeh
Byeong Gwon Park
Jeffrey Thomas Pattison
Trey Thomas Pfeiffer
William Iddo Pittman
Mitchell Robert Pollee
Kyle Edward Raden
Michael James Rasmussen
Nicholas John Raterman
Kristian Rafael Rego
Matthew Robert Rist
Daniel Adam Setili
Patrick Alton Sharp
Richard John Simon
Tyler Christopher Sloan
Tyler Russell Smith
Jacob Charles Smyth
Sarah Elizabeth Sonego
Matthew James Strzalkowski
Jeri Ann Sutter
Michael David Vanbemmelen
Amad Rashad Wahib
Matthew Hall Walz
Zirui Wang
Taojun Wanyan
Brendan John Webberly
Gino Anthony Wickman
Ashley Anne Wilkey
Colby Steven Williams
Jacob Jerome Wojnicki
Nicholas Joseph Wojno
Carly Paige Wolf
Penghao Wu
Shiyuan Zhong
Yitian Zhu
Jonathan Michael Zofchak

Nominate

your favorite professor for the 2018 Withrow Teaching Excellence Award!

Deadline: Friday, Nov. 17

To access the Nomination Form:

1) Go to the ME Website:

https://www.egr.msu.edu/me/

2) Click on Undergraduate

3) Click on Forms and Policies

4) Select Withrow Nomination

THANKS!

Teaching Award Nomination Form:

Baja SAE

Like working with your hands? MSU Baja is MSU's student run, off road racing team. We design, build, and compete with a new student built car every year! Baja is an SAE collegiate design competition that has serious weight on your resume. You will apply the technical knowledge you are gaining in your classes to the real world, building practical experience with a community of similar hard working students.

Engineering is not all that Baja has to offer. We are a sponsor-funded organization, and the competitions have a judged sales presentation where our team gives a sales pitch on how we will profit off the vehicle. Anyone interested in sales or marketing will gain real life experience communicating with our many sponsors, and practice finding creative but practical ways to sell a product, with points on the line instead of money. We also have graphic design opportunities to help design posters, brochures and make videos to promote the team.

All majors are welcome; to learn more, check out msubaja.com. You can contact us by email at baja@msu.com, or come to our weekly meetings every Monday at 6:10 p.m. in room 2320 EB. *Submitted by Luke Crompton, Chief Engineer.*

PHOTO PROVIDED BY LUKE CROMPTON

Ray Renaud drifting in Ace.

Pi Tau Sigma

Pi Tau Sigma members will continue its dedication to STEM outreach and philanthropy this semester. Members will volunteer with Women in Engineering to host an activity at Girls' Stem day on November 11. At the event, the participant girls will design boats of aluminum and test them to investigate how many pennies they can hold. The will then modify their designs to maximize the number of pennies they can hold. Pi Tau Sigma will host Senior Elective Night on October 26 to familiarize interested mechanical engineering majors with the wide variety of senior electives available to them. Members will also travel to Lansing in either late October or November to volunteer at Habitat for Humanity. Projects vary based on the year, but most either focus on the restoration or tear down of a home, or providing assistance at the Lansing Habitat for Humanity Lansing ReStore. *Submitted by Michael Bigelow, President.*

Formula SAE

The Michigan State Formula Racing Team has been gearing up for another super exciting season. We are currently finishing up all of our designs for the new car and we are excited with some of the new and impressive changes being made to help our car stay competitive among the top teams in the world. This year's car is going to be lighter faster and more reliable than ever and we are very excited to show it off come spring time.

Along with design, our recruitment process is in full swing and as of writing this update we have about 100 students interested in joining the team. This is a great time for the team because it allows fresh ideas to flow into our designs and also lets us see who will be the future of our team.

With everything going on, it is gearing up to be another great season. We would like to thank all of our supporters for helping us continue our passion, without you we would not be able to accomplish our goals. *Submitted by Paul Sandherr, Project Manager.*

Michigan State University Design Day College of Engineering

Friday, December 8, 2017
Engineering Bldg

Come and see our students lead, create, and innovate

- Competitions
- Demonstrations
- Presentations
- Awards

SPRING SEMESTER SENIOR ELECTIVES

▶**The asterisk (✻) after a course number indicates that it has been officially designated as "Design Intensive."**

ME 417✻ Design of Alternative Energy Systems. 3(3-0). Prereq: ME 410 or concurrently.

ME 426 Introduction to Composite Materials. 3(3-0). Prereq: ME 222.

ME 433 Introduction to Computational Fluid Dynamics. 3(3-0). Prereq: ME 410 or concurrently.

ME 442✻ Turbomachinery. 3(3-0). Prereq: ME 332.

ME 445✻ Automotive Powertrain Design. 3(3-0). Prereq: ME 444.

ME 464 Intermediate Dynamics. 3(3-0). Prereq: ME 361.

ME 465✻ Computer Aided Optimal Design. 3(3-0). Prereq: (ME 222 and 280) and (ME 371 or concurrently). ***Online Course***.

ME 477 Manufacturing Processes. 3(3-0). Prereq: (ME 222) and (MSE 250).

ME 478 Product Development. 3(3-0). Prereq: ME 477.

ME 490 Independent Study. 1-4 credits. *See Override Instruction #1 below*. You may reenroll for a maximum of 6 credits.

ME 495 Tissue Mechanics. 3(3-0). Prereq: ME 222. ***Biomechanical Concentration Course***.

ME 497✻ Biomechanical Design in Product Development. 3(3-0). Prereq: ME 371 or concurrently. ***Biomechanical Concentration Course***.

BE 444 Biosensors for Medical Diagnostics. 3(3-0). Prereqs: (BS 161) and (CEM 141) and (ECE 345). ***Biomechanical Concentration Course.*** *Alocilja*.

CHE 483 Brewing and Distilled Beverage Technology. *See Override Instruction #4 Below*. Location: 2000 Merritt Road, East Lansing. Prereq: (Age 21 or higher) and (Senior standing) and (ME 410-Heat Transfer or concurrently). *Berglund*.

CE 407 Materials Engineering: Properties, Selection and Processing. Prereq: (CE 221) and (ME 222). Recommended Background: MSE 250. *Lu*.

ENE 422 Applied Hydraulics. 3(2-2). Prereq: ME 332. *Pokhrel*.

MSE 465 Design & Application of Engineering Materials. 3(3-0). Prereq: MSE 250. *Qi*.

Graduate Level Courses: Honors College members and/or students with 3.5+ GPAs might consider taking a graduate course as a senior elective. Before enrolling, several signatures, including that of the instructor, are required. Possible choices for Spring 20178include ME 814, 825, 861, and 872. *See Override Instruction #3 below*.

OVERRIDE INSTRUCTIONS

1) ME 490–Independent Study Enrollment Procedure: Find a professor who is willing to supervise your independent study, and discuss your plans with him/her. Complete an *ME 490/490H Enrollment Contract* (independent study form), available in the ME Advising Office in 2560 EB. After you and your professor have completed and signed both sides, return the form to the ME Advising Office for the remaining signatures, override, and enrollment.

2) Complete and submit the ME Override Request Form: https://www.egr.msu.edu/me/me-override-request Please note that the ME department cannot overfill required courses to resolve conflicts with Senior Electives, Other Electives, Integrative Studies courses and employment schedules.

3) Complete the *Graduate Course Override* form, available in the ME Advising Office in 2560 EB. This is a paper form.

4) CHE 483–**This course is full and no additional overrides will be given**. You can still set an alert via Schedule Builder, but it would be a good idea to enroll in a back-up course.

Department of Mechanical Engineering

MICHIGAN STATE
UNIVERSITY

ME Advising Office
Dept of Mechanical Engineering
Engineering Building
428 S. Shaw Lane, Rm 2560
East Lansing MI 48824-1226

Fall Semester Calendar

November 10	All currently enrolled students who have not enrolled by 8 p.m. in at least one course for Spring will pay a $50 late fee.
November 17	**Deadline for Withrow Teaching Award Nominations.** The nomination form is on the ME website (https://www.egr.msu.edu/me/). [Click on Undergraduate, and then Forms and Policies.]
October 26	Senior Elective Night, 7:30-9:00 p.m., 2400 EB. Sponsored by Pi Tau Sigma.
Nov 23-24	Thanksgiving recess
December 8	**Last day of classes & Design Day.**
December 16	Undergrad Commencement Ceremony-Breslin at 2 pm. Lasts about 2 hours. No tickets required.
Dec 11-15	Final Exams
Dec 16-Jan 7	Semester Break
January 12	On-line Open Add Period for Spring 2018 ends at 8 p.m. **ALSO**, this is the deadline for May 2018 and August 2018 graduates to apply for graduation.
March 12	Scheduled Computer/Telephone Enrollment period for summer semester begins.
April 1	Computer Enrollment period for fall/spring 2018-2019 will begin on *approximately* April 1. Your enrollment access date will be posted on StuInfo in mid-March.