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ME Senior, Vikram Mandelia, stands outside of the North Portico of the White House at the conclusion of an “East Wing” tour. Read about his White House Internship experience on page 5!
Connecting the Dots

There is little debate that Steve Jobs was one of the greatest innovators of our time. His curiosity and creativity are benchmarks for both individuals and companies.

One of my favorite Jobs quotes appeared in Wired, February 1996:

“Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn’t really do it, they just saw something. It seemed obvious to them after a while. That’s because they were able to connect experiences they’ve had and synthesize new things. And the reason they were able to do that was that they’ve had more experiences or they have thought more about their experiences than other people.”

“Unfortunately, that’s too rare a commodity. A lot of people in our industry haven’t had very diverse experiences. So they don’t have enough dots to connect, and they end up with very linear solutions without a broad perspective on the problem. The broader one’s understanding of the human experience, the better design we will have.”

Every time I read this quote I have a strong urge to listen to strange music until it no longer sounds strange; talk to people from another country and learn something new about their culture; take an art course to better appreciate the use of color and perspective to express emotion; walk through botanical gardens to observe what nature has learned about structure and multi-disciplinary function. I want more dots. I need more dots.

I don’t know how or when those dots will connect, or which ones will connect. If I knew, then I could construct the perfect curriculum for gathering and assembling dots. How boring that would be! Instead, I get to enjoy the pursuit of dot collecting, and anticipate those moments when, without warning, seemingly unrelated experiences will connect in a way that reveals a new interpretation of an old problem. And that is the seed of innovation.

I’m really fortunate that I get to spend my tomorrow exploring a large, diverse and vibrant university campus, a rich garden of assorted experiences waiting to be harvested.

And so are you. I hope you will take advantage of these opportunities while you are here. Your future engineering innovations may just depend on it.

42 ME Students Receive Awards

Congratulations to forty-two ME students who were honored at the Evening with Industry Awards Banquet on February 19! The names of those receiving high achieving student recognition are italicized on the Dean’s List on page 7. Seven students were presented with the following awards:

**Outstanding Women in Engineering (WIE) Award:**
- Jessica Buschman (ME Senior), presented by Meritor WABCO.

**Outstanding Society of Women Engineers Award:**
- Lucia Delvillano (ME Sophomore), presented by Union Pacific Railroad.

**Diversity Programs Awards:**
- Darius Barrett (ME Senior), presented by Bosch.
- Noelle Kahunguba (ME Senior), presented by Toyota Motor Engineering & Manufacturing North America.

**Exceptional and Distinguished Service Awards:**
- David Caples (ME Senior), nominated by Dr. Gary Cloud.
- Jennifer Jones (ME Senior), nominated by Alexa Jones (BE Senior).
- Jason Thelen (ME Senior) nominated by Dr. Gary Cloud.

**Academic Advising**

1) **ME Juniors and Seniors** are advised by Gaile Griffore. For an appointment, call 355-3338, or go to 2560 EB.
2) **Sophomores with a 3.0 GPA** who will be juniors at the end of this semester 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 Carmella Davis-King. To schedule an appointment, call 355-6616 x 2.
4) **ME Freshmen** are advised in W-8 Wilson Hall on a walk-in basis only.
Submit your poem to the 2014 College of Engineering Poetry Forum

Submission of poetry from March 10, 2014 to April 10, 2014. All poets are welcome!

JOIN the excitement of creating a lasting poetical endeavor!


SEND all poems to poetryforum@egr.msu.edu

Submissions will be printed!

Special Overrides

• Transfer Prerequisite Override: If you plan to take the prerequisite for an ME course at another institution this summer, you must submit a Transfer Override Form, so that you can receive a prerequisite override and enroll in the next course in the sequence. The form can be found at: http://www.egr.msu.edu/me/form/me-transfer-override-request

• ME 410 and 412 may both be taken during Summer Semester, but you will need a prerequisite override for ME 412. First enroll in ME 410. Then, submit the ME Override Form on the ME undergraduate website. Select “Other” for Reason for Request and write that you are taking both ME 410 and ME 412 this summer.

• ISS 3xx Overrides: Students who transferred their first ISS course need a prerequisite override before enrolling in ISS 3xx. To obtain the override: Go to 302 Berkey Hall on Monday-Friday at 8:30 a.m.-4:30 p.m. Say that you transferred your first ISS and you need a prerequisite override to take the 300-level course. Be prepared to tell them the course number and section you are requesting. ► You must select a section that has an open seat. You will NOT receive an override for a full section!
**Enroll in Your Summer Classes ASAP!**

The summer enrollment period begins on March 10, and your enrollment date is posted in StuInfo. The ME department will be reviewing the summer enrollments in April, and underenrolled courses may be cancelled.

- **It is in your own best interest to enroll in your summer courses as soon as you have access to the enrollment system.**
- **Low summer enrollments could mean canceled courses.**

The following courses are on the summer schedule and will be of interest to ME majors:

- **First Session:** CE 221; ME 201 (in Farmington Hills); 361, 391, 410, 461; MSE 250; STT 351.
- **Second Session:** ME 201; 222 (see Note below); 412; 471; STT 351.
- **Full Session:** ME 465; 490.

You will also find Integrative Studies and Bioscience courses, plus courses that can be used as Other Electives.

**Note:** For Summer 2014, ME 222 is being offered as ME 399, section 201. To request an override, submit the ME Override Request form: [http://www.egr.msu.edu/me/form/me-override-request](http://www.egr.msu.edu/me/form/me-override-request).

**IMPORTANT:**

If you take the prerequisite for an ME course at another institution this summer, you must follow the Special Override instructions for Transfer Prerequisite Override requests (see Special Overrides on page 3 of this newsletter).

**Department News**

- **Dr. Abraham Engeda** was on sabbatical during Fall 2013 and spent part of the time at the Chinese Academy of Sciences. He and one of his graduate students, **Chris Paul**, worked on two major topics in cooperation with their Chinese hosts. One topic explored the efficiency potential of a solar, biogas powered and recuperated gas cycle, and the second addressed the design of very-high-flow coefficient radial flow compressors that go beyond current practices.

- **Dr. Peter Lilleshøj** was awarded a National Science Foundation (NSF) CAREER award for his proposal “Wearable, self-powered biosensors for disease detection and health monitoring.” The goal of this 5-year project is to develop a new class of wearable, self-powered textile biosystems for in situ health monitoring and disease detection. This technology will be integrated directly onto fabrics and garments to provide lightweight, unobtrusive wearable sensing systems that do not compromise wearer mobility, comfort or attention. In addition to his research efforts, this award will support his education and outreach initiatives which include developing new undergraduate and graduate curriculum, recruiting and mentoring engineering students in biomedical technologies, and developing new outreach programs for middle/high school teachers and students to promote STEM fields to future generations of K-12 students.

- **Dr. Javier Alcazar** has joined the ME department as an academic teaching specialist. He received his Ph.D. from Cornell University in 2006 and then went to work for General Motors Research and Development. Since 2009 Dr. Alcazar has been a senior researcher in their Manufacturing Systems Research Laboratories where he was co-initiator, co-manager, and principal investigator of human-robot interaction. His team collaborated with three Canadian Universities to evaluate vision sensors (kinect and bumblebee), touch sensors (PPS, Syntouch, graphene transistors, FRS), and six axis sensors (FANUC, Barrett) with the goal of having human and robots working shoulder to shoulder. This semester he is teaching ME 361, and he is in charge of the ME 451 lab.

- **Invent ME Award Winners.** The winners of the Invent ME Competition are:
  - Jacob Brandon, Sophomore
  - Nick Chocko, Junior
  - Jeff Hall, Sophomore
  - Lucas Johnson, Sophomore
  - Joseph Kuehnlein, Sophomore
  - Jack McDougall, Sophomore

**ME 481 News**

Normally, May graduates take ME 481 during their last spring semester. However, a limited number of May 2015 graduates may be able to take ME 481 next fall instead of spring.

If this interests you, watch for an email from Gaile with details.
This past fall semester, I had the opportunity to participate in the White House Internship program. I took a semester off from differential equations and dynamics and instead conducted research, volunteered at White House events, and above all soaked in all I was witnessing around me.

It was truly an amazing experience to have a firsthand look at how the administration serves the country. Especially as an engineer, I feel extremely lucky to have had the opportunity to have a window into federal service and witness how the public and private sectors interact. No matter what industry or sector you work in, the federal government somehow interacts with it. Whether from funding research through grants, to regulation and oversight, the federal government has a relationship and plays a role with all sectors of the country.

What drove me to apply for the opportunity was my desire to witness and gain an understanding of the relationships and interactions that occur between the White House and the STEM and technology industry. What I witnessed and learned through my time at the White House was invaluable. The biggest takeaway for me was the level of passion and dedication each member of the administration has for public service and serving the country. Regardless of the department or policy portfolio, the passion of all of the members I interacted with was immense and contagious.

I had the good fortune of interning during the fall semester which includes a plethora of holidays. Interns had the opportunity to help out and volunteer at different holiday events (I never thought that taking a break from work would consist of helping to make bats to decorate the North Porch!) The friendships I formed with my fellow interns and hearing their experiences and passions for public service also helped to deeply enrich my experience.

My experience has furthered my understanding of government work and public service. I hope to one day become a patent attorney and also work with STEM and technology policy and legislation, either from the legislative or reporting realms. I would highly encourage other students to take advantage of these opportunities and intern in government entities. While my fellow ME friends may feel this type of work is more of a James Madison student’s cup of tea, NASA is after all, a federal agency of the presidential administration as well.

**White House Internship Program**

Young leaders from all across the nation have an opportunity to develop their leadership skills and gain exposure to the public service sector through the White House Internship Program. The assignments given to an intern on any given day could include conducting research, managing incoming inquiries, attending meetings, writing memos, and staffing events.

While the interns’ responsibilities and tasks vary by department, all interns are united through weekly events including a weekly speaker series with senior staff members and small group meetings exploring different policy aspects of the Executive Office of the President through speakers, discussion and off-site field trips.

The application for the Fall 2014 White House Internship Program is now open. To apply for the White House Internship Program, please see http://www.whitehouse.gov/about/internships/apply.

For application deadlines and program dates, please see http://www.whitehouse.gov/about/internships/faqs.

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**COVER STORY**

**ME Senior Participates in the White House Internship Program!**

By Vikram Mandelia, Senior Majoring in Mechanical Engineering and English

PHOTO PROVIDED BY VIKRAM MANDELIA

ME Senior, Vikram Mandelia, touring the Press Briefing Room located in the West Wing of the White House.
Congratulations and best wishes to all ME graduates! On behalf of the 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 February 28. If your name is missing, please contact me immediately at grifore@egr.msu.ed (Tele: 517-355-3338). — Gaile

Jin Won Ahn
Hassan Qassim Alyousef
Abdulrahman Omar Bafaraj
Christopher Steven Baldwin
Ann Elizabeth Barrett
Garrett Edward Baughman
Benjamin James Bennetts
Peter Hans Bensel
Megan Elizabeth Blaszk
Brandon James Cameron
David Clancy Caples
Zhenyu Chen
Deonte Michael Childress
Brinn Marie Cochrane
Benjamin Timothy Cooper
David Glenn Crouse
Caitlin Danielle Cubba
Daniel-Deane Drake Delorme
Ronald Courtney Dewberry
Thomas David Dionne
Megan Elise D'Mello
Martin William Driscoll
Jonathan Robert Erickson
Samrawi Berhanu Gebemeditin
Grant Gerard Golasa

May Graduates
Gustavo C Gomes
Rubio Gong
Jason Orville Gridley-Waters
Lauren Elizabeth Hart
Brett Russell Hewitt
Thomas Daniel Hotari
Daniel August Howarth
Jeffrey D Hulbert
Katherine Michelle Jansen
Croix James Jastrow
 Rochelle Kirstchner
Haoqi Liu
Zhijing Liu
Jeffrey Donald McCague
James Marion Lehto Miller
Margaret Rose Moore
Alexander Yohei Morita
Timothy George Najar
Matthew Thomas Nees
Suzanne Oshea Normand
Benjamin Edward Oberski
Nicholas Adam Palazzolo
Brooke Kailyn Peruski
Jeffrey Thomas Philippart
Matthew David Pingel
Kevin Lawrence Pruess
Todd Rick Sabotki
Justin Anthony Sagorski
Eric Raymond Schendel
Scott Louis Schimp
Alan M Seery
Jonathan Daniel Shapiro
Gregory Ryan Smiecinski
David Spears
Yubing Su
Nathaniel Alexander Sunderland
Stephen Michael Tatangelo
Ryan Nicholas Thompson
Michael Joseph Uggeri
Hanna Elizabeth Vandermoere
Jeffrey Alan Vonlinsowe
Brittany Clair Watton
Kyle Lawrence Watts
Susan Mallory Whitenight
Todd Joseph Wloverton
Jonathan Anthony Woo
Peter George Woodbridge
Qichen Xiao
Ge Zhu

August Graduates
Jin Chen
Timothy Myung-June Jang
Tae Kyong Lee
Matheus P Morais
John Franklin Potts
Kyle Jordan Silcox
Miles Bruce Turrell
Yoqing Yang
Yongkang Zhou

Fall 2013 Dean’s List

Congratulations to the following 302 mechanical engineering majors who made the Dean’s List after Fall Semester with a semester GPA of 3.5 or higher. This list was taken from the Registrar’s official website, which is updated regularly: http://www.reg.msu.edu/ROInfo/GradHonor/DeansList.asp.


NOTE: Academic Award recipients’ names are italicized.
Communication is a Social Media World
by Craig Gunn, Director of Communications

When it comes to COMMUNICATION, “the times are a changin’.” In the old days we wrote lots of letters, we visited people to pass on news, and we spent a great deal of time pondering over what we would say to others.

The other day I was watching the second movie in the Hellboy series and it caught my attention that Hellboy had spent hours trying to manufacture a note to his girlfriend about his love for her. Crumpled notes lay all over the floor and he still was unable to present to her a clear indication of his feelings. He was working his way through an act of communication.

Jump ahead to the current day and we are so immersed in social media that we don’t think about anything. We used to call it “blurt out.” It was a time when you failed to put any thought into anything. You just said it. The examples today are far too many to print, but the world is full of times when individuals started a barrage of social media messages that were based in falsities or blatant attempts to hurt others.

Engineering is a rigorous discipline based in order, fact, and complete reliability. It is not counter to social media, but engineers are asking for severe consequences if they do not make every effort to think about what they present to the world through that social media. Thinking very seriously about the content of that tweet or the text flippantly posted on Facebook may be the difference between a promotion and a quick walk to the door carrying all your personal belongings from your desk, accompanied by your employer’s security guard. Communication is actually what the word implies, the presenting of information. The important part is making sure that what you COMMUNICATE is exactly what you wanted to present.

Co-op. Co-op. Co-op.
by Kyle Liechty, Co-op / Internship Coordinator

Over the past couple months, The Center for Spartan Engineering has been taking great strides in attracting traditional co-op employers to campus for recruitment activities, which is providing an immediate spike in job offers for our first- and second-year engineers! While the traditional summer experience naturally fits well with a student’s academic schedule, a growing number are testing the waters of a rotational structure by taking a semester or two off to gain invaluable work experience while still enrolled at Michigan State University.

Before accepting an offer, it is essential to develop multiple course plans with an academic advisor and present the possibilities to the co-op employer, to minimize setbacks that would further prolong the road to graduation.

Also, co-ops are done differently at every company that may offer those positions. Some employers look for a student to stay for two or three four-month sessions, while others may be looking for longer (or even shorter) assignments, allowing co-ops to explore various departments and locations inside of the company. A good portion of Michigan-based companies are even making it possible for students to study and work during the same term with part-time positions during the fall and spring semesters with full-time expectations in the summer. However, the flexibility is dependent on the company’s expectations and can be discussed and negotiated with your academic plan in mind.

The College of Engineering also has a structured method to provide a deeper academic reflection and backing on the experience with EGR 393. It is a credit bearing course that will allow students to remain full-time while in an internship or co-op position and consists of bi-weekly open discussion forums, learning modules on workplace ethics, and a final reflection of the overall work assignment. Students can receive more information about this course at The Center in 1340 Engineering Building.

Looking at other recent successes, the Engineering Expo attracted over 125 employers to campus from all sectors in engineering. In total, approximately 900 students participated in the event and gained critical knowledge about the companies that filled the halls of the Engineering Building. Many of the companies have issued offers or scheduled interviews with our students, while others attended to increase branding and student relationships at the University. Regardless of whether an offer was made are not, MSU students are now on the radars of companies with operations worldwide, from TechSmith Corporation in Okemos to Green Mountain Coffee Roasters in Vermont and beyond!

Though the semester has hit its midway point, there are still opportunities available and workshops scheduled until commencement in May! Students are encouraged to check out the engineering calendar and MySpartanCareer on a regular basis for engagement workshops and job opportunities that will provide opportunities to get connected with companies from near and far who are seeking Spartans to make an immediate difference in their corporate family.

For more information and personal assistance, contact our Co-op / Intern Coordinator, Kyle Liechty, at liechtyk@egr.msu.edu or 517-355-5163!
In the past few decades, nanotechnology has entered many areas of ordinary life, from stain-resistant pants fabric to antimicrobial food storage containers and even to sunscreen and some foods. But some of the most exciting advances using nanotechnology are light-emitting devices, solar photovoltaics, and biomedical imaging and therapeutics. Nanocrystals - that is, tiny chunks of crystals with dimensions smaller than about 100 nm - exhibit exciting optical and electronic properties that can make more efficient devices, expand the versatility of the devices, and can be much cheaper to manufacture than their bulk counterparts.

There are many ways to make nanocrystals of different materials, but a great fraction of them are fraught with environmentally unfriendly or time-consuming solution-based processing steps. In contrast, one method that has shown great promise for making some semiconductor nanocrystals and which sidesteps both the toxic solvents and the lengthy processing time is the nonthermal plasma reactor. Plasma reactors use gaseous precursors and produce nanocrystals of excellent quality in a short time period (See Figure 1). In the Plasmas and Aerosols Laboratory we use nonthermal plasma reactors and gas-phase-based processing for creating, modifying, and depositing nanocrystals. Our focus is on nontoxic materials for energy and biomedical applications.

One particularly attractive material we are working on is silicon: nanocrystals of silicon can be efficient light emitters and absorbers, with properties that are tunable based on the nanocrystal size. Additionally, in contrast to other popular semiconductor nanocrystals like lead sulfide and cadmium selenide, silicon is largely nontoxic. Nanocrystalline silicon has a wide range of applications, and is also relatively simple to make using the plasma reactor, despite its high crystallization temperature. Yet the plasma reactor is basically a room-temperature processing tool. Because the plasma causes a small number of the gas atoms to become ionized, reactions between that tiny fraction of ions and electrons cause exothermic releases. Those reactions allow the nanocrystals to reach high temperatures, even though the bulk of the gas is not hot. The size of the nanocrystals, their internal structure, and other physical properties can all be adjusted using parameters of the plasma reactor by controlling the rates and types of reactions.

The exothermic reactions between ions, electrons, and other excited-state gas species also give the plasma the ability to modify the surfaces of nanocrystals in-flight. Surface modification for nanocrystals is often crucial for exploiting their desirable properties. For example, many nanocrystals (silicon included) have optical properties like luminescence that are dependent on the chemical environment at the nanocrystal surface, and so scientists and engineers need to predict and control the nanocrystal surfaces to control the resulting properties. In another example, to use nanocrystals in biological applications like in-vivo cellular imaging, the nanocrystals should be soluble in water, which is typically not the case immediately after synthesis.

For silicon, the surface modification can be in the form of saturating all the surface atoms with hydrogen, oxidizing the surface to form a layer of SiO2, or attaching molecules such as carbon chains to the nanocrystals. Most surface modification strategies require batch processing of nanocrystals in a combination of different solvents and several purification steps afterwards. However, the plasma can be used to modify the nanocrystals as they pass through the reactor, so that they are collected with their surfaces already optimized.

Nanocrystal synthesis and surface modification are two powerful attributes of plasma reactors. The third strength of using this aerosol-based tool is the ability to incorporate the nanocrystals into different types of layers by using only gas-phase technology. The nanocrystals can be deposited on filters as a fluffy powder. Alternatively, using nozzles and other engineering tools, they can be deposited in dense layers that behave more like thin films. Simple adjustments to the reactor design and operating parameters let us change the characteristics of the deposited nanocrystals (See Figure 2). This allows unique flexibility in the morphologies of the layers we can deposit, and on the types of substrates that can be used.
Typical solution-phase processing of these nanocrystals would not allow us
to issue the same control over nano-
crystal layer structure or the substrate
materials.

As a tool, the plasma reactor
gives us an environmentally-friendly,
streamlined, and controllable method
for depositing layers of functional
semiconductor nanocrystals. The
current projects in our lab include in-
flight surface modification of silicon
nanocrystals for biological imaging
applications, continued work on
light-emitting diodes from silicon
nanocrystals, and synthesis of new
semiconductor nanocrystals and new
shapes and morphologies using the
plasma reactor. Going forward, we
hope to expand the ways that plasmas
and aerosol processing can be used in
the production of sustainable tech-
nologies.

**Burning Things in Space** by Dr. Indrek Wichman

One of Dr. Wichman's research
projects, funded by NASA since 1999,
seeks to develop an apparatus to
simulate zero-g flame spread on earth.
There is one minor problem: in order
for us to check whether our appara-
tus in ERC South simulates in-space
conditions, we need data from real
zero-g, AKA space!

That's exactly what happened on
February 19, 2014, when astronaut
Rick Mastracchio on the ISS (Inter-
national Space Station) carried out
about 4 hours of experiments for Dr.
Wichman's research project. There
were four runs, two lasting about 1/2
hour, where we burned polymethyl-
methacrylate (plexiglass) and mea-
sured the flame spread rate of flames
and visually recorded the spreading
flames. They looked incredible, and
the data look to be excellent. One
observation we made immediately:
space flames generate a lot of CO,
which is very dangerous in the case of
an unwanted space fire.

All around, the experience was
unique and very eye-opening: NASA
truly does have amazing facilities and
their scientific workers and astronauts
are completely dedicated. As a side
note, the ISS travels at about 17,000
mph in its orbit 250 miles above earth,
so those two tests each took about
8,500 miles to complete! Graduate
students A. Hariharan and V. Don-
tamsetty are working on this problem
with Dr. Wichman in ERC South.
Please come see our lab!
The following information was taken from the NCEES website: http://ncees.org/

NCEES (the National Council of Examiners for Engineering and Surveying) is a national nonprofit organization dedicated to advancing professional licensure for engineers and surveyors. It develops, administers, and scores the examinations used for engineering and surveying licensure in the United States. It also facilitates professional mobility and promotes uniformity of the U.S. licensure processes through services for its member licensing boards and licensees. These services include the records program, study materials, credentials evaluations, exam administration, and more.

The Fundamentals of Engineering (FE) exam is typically the first step in the process leading to the P.E. license. It is designed for recent graduates and students who are close to finishing an undergraduate engineering degree. The FE is a computer-based exam that is administered year-round in testing windows at NCEES-approved Pearson VUE test centers.

The FE contains 110 multiple-choice questions. The exam appointment time is 6 hours long, which includes a nondisclosure agreement, tutorial (8 minutes), the exam (5 hours and 20 minutes), a scheduled break (25 minutes), and a brief survey. Learn more at: http://www.youtube.com/playlist?list=PLiZ0hJHNi9jzR8RW69ndkJlgH8bzi0ew-

To register for an FE exam, log in to your MyNCEES account, select the REGISTER button, and follow the on-screen instructions. Learn more about the exam and the exam environment by reading the rules and policies in your NCEES Examinee Guide (downloadable from the website).

FE exam specifications


Exam fees and requirements

An exam fee of $225 is payable directly to NCEES during the registration process. Some licensing boards may require examinees to file a separate application and pay an application fee as part of their approval process in order to be qualified for seating for an NCEES exam. You will be notified during the registration process if the licensing board you selected has additional requirements.

Reference Materials

The NCEES FE Reference Handbook is the only reference material that can be used during the exam. It is provided onscreen electronically during the exam. It is also available for purchase as a hard copy and for free download electronically on the NCEES website.

Practice exams

NCEES offers computer-based practice exams that contain questions and solutions from past exams. They also simulate the real format, style, and level of difficulty. Learn more about NCEES computer-based practice exams here: http://ncees.org/exams/study-materials/

Scoring and reporting

FE exam results are typically available 7–10 days after you take the exam. You will receive an email notification from NCEES with instructions to view your results in your MyNCEES account. Results include information specific to your licensing board regarding how you should proceed based on your performance.

Study Abroad in 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. With respect to 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).

Even with this history, the mechanical engineering facilities are very modern, allowing the faculty and students to pursue research topics varying from wave energy to microfabrication.

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.

Students can take courses that fulfill their entire Senior Elective requirement (12 credits of Senior Electives, including a 3-credit design intensive course). Examples of courses include:

- Sustainable Energy Group Design Project (Design Intensive)
- Marine Energy
- Manufacturing Technology
- Wind Energy
- Polymers and Composite Materials

For more information, contact:
- Gaile Griffore, ME Advisor
  Office: 2560 EB / Phone: 517-355-3338
  Email: griffore@egr.msu.edu
- Maggie Blair-Ramsey, Coordinator
  Engineering Study Abroad Program
  Office: 1108 EB / Phone: 517-432-2012
  Email: blairram@egr.msu.edu
MSU – RWTH Aachen Program by Dr. John Foss, Program Director

MSU/ME students with a 3.0 GPA or higher have the amazing opportunity to: 1) live in Aachen, Germany (mid-May to end of July 2015), 2) carry out 5 credits independent study plus 4 credits German language, and 3) travel in Europe with planned 3-day weekends. The ME 490 experience will be 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 to easily reach Munich, Paris, Amsterdam, and many more cities on their 3-day weekends.

Former students are the best sources of information; they can be reached through Professor J. Foss, Program Director. Please don’t hesitate to talk to former students! They are more than willing to share experiences and information about the program. The 2015 organizational meeting will be held soon after the publication of this issue of the ME Bulletin. Contact foss@egr.msu.edu or 355-3337. 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 obtain equivalent credits for ME 201 or ME 410, both taught in English. Students 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>

Pi Tau Sigma

The Tau Epsilon Chapter of Pi Tau Sigma, the international mechanical engineering honor society, has begun the semester with the hopes of bolstering and incentivizing membership within its elite ranks. Already our members and potential initiates have taken part in the Student Engineering Council Blood Drive, assisting in the set-up of the Engineering Expo, volunteering at Impression 5 and the Vex Robotics Competition, and engaging in a round table discussion of senior electives.

The rest of the semester is full of informational and fun social events including a chapter game night on Tuesday, March 25th as well as the annual Wing Night which is scheduled for April 8th.

The leadership positions of the Tau Epsilon chapter of Pi Tau Sigma are full of new faces that are eager to extend the group’s presence within the engineering college, MSU campus, and greater Lansing community. The goal is to provide a worthwhile experience within the organization as well as provide members with exclusive benefits and opportunities.

For more information you can visit the Tau Epsilon chapter’s website at http://www.egr.msu.edu/pts as well as the national headquarters website at http://www.pitausigma.org. Submitted by Grant Ridley, President.

American Society of Mechanical Engineers

The MSU Student Chapter of the American Society of Mechanical Engineers is a non-profit student organization, the main purpose of which is to introduce MSU students to the world of engineering. The Chapter provides a great opportunity for students to meet representatives of leading industrial companies, allowing students to learn about these companies and about possible internship and employment opportunities.

In Spring 2014, ASME will be hosting various informational sessions and bringing in different companies for presentations. These sessions are a great way to meet company representatives and let them learn about you. These interactions with professional engineers, some of whom are MSU alumni, are a great starting point for building your professional network. These events also provide an opportunity to mingle with your fellow engineering students and get involved with them outside of the classroom.

The Chapter is also responsible for the organization of various science and engineering oriented events, including some aimed at getting high school students, and even younger kids, involved and excited about engineering. To learn more about our upcoming events please visit http://www.egr.msu.edu/asme/events.html. Submitted by John Pasko, President.
Department of Mechanical Engineering

Formula SAE

Michigan State’s Formula SAE Team has been hard at work building this year’s car. Over winter break, the team spent long hours at the shop manufacturing and preparing for final assembly. Although a lot of work still lies ahead for the team, they have made a significant amount of progress.

The team is eager to begin final assembly and eventually test the car. They have already registered for both the Michigan and Nebraska competitions. Competition lasts four days and consists of both static and dynamic events that judge the team and vehicle’s design, manufacturability, cost effectiveness, and marketability. Last year the team placed 9th overall at the Michigan competition out of 120 universities from around the world.

In January, the Formula Team was on display at the North American International Auto Show for the 7th consecutive year. This was a great opportunity to bring attention to the team and the university as a whole.

The Formula Team is funded entirely through donations. Please support them in any way possible to continue this invaluable learning experience for engineering students. Donations can be made to the Cloud Endowment for a lasting impact on the team. For more information, visit: www.msuformularacing.com. Submitted by Dan Riggs, Project Manager.

The Formula SAE Team and their display at the 2014 North American International Show.

PHOTO PROVIDED BY DAN RIGGS

SAMPE

Interested in composites, new materials or latest manufacturing research? Interested in an opportunity to visit Europe/Japan (air travel and hotel expenses paid)?

The SAMPE (Society for the Advancement of Material and Process Engineering) MSU Student Chapter invites undergraduate and graduate students as members. This is a great society that encourages students to participate and learn the latest research in the field. With many students active in several design projects, this will be a good opportunity to understand material and manufacturing technologies. The tentative plan for the student chapter is to meet once a month and discuss latest research in materials.

Benefits of Being a SAMPE Student Member

• Meetings, Seminars, and Literature

Meetings, seminars, publications, and technical papers are forums available for members to discover and access the most advanced materials and processes being developed by the scientific community. Local chapters provide organized gatherings, allowing you to meet others in your community.

• Networking Opportunities

For many of its dedicated members, the most important aspect of SAMPE is the ability to help make new contacts, forge enduring associations, and promote lasting friendships, as well as significant career advancements.

• Employment Assistance

SAMPE offers strong employment assistance for members through its international network of contacts. If you are seeking employment or are looking for other career opportunities, our membership services adviser is there to help connect you with engineering managers and other decision makers looking to fill positions.
Baja SAE

Michigan State’s Baja SAE team has been hard at work designing, fabricating and assembling components for this year’s upcoming race season. Lead by Briita Wanhala and Thomas Dionne, this year’s car looks to be one of the best in half a decade. With the help of their sponsors and hard working team members, the Baja team looks to have their car completed and fully tested by the end of the school year.

While much of the car is already finished, many team members still work hard to gain optimal performance from the cars systems, like Evan Boyers’ work to optimize the power train assembly and Troy Christian’s work to gain optimal break performance. With the help of new members like Nathan Gill, the team has prepared four cars from previous years to compete in a race held each year at Michigan Tech. This race, known as Blizzard Baja, will provided new members to the team with experience for the team’s SAE races in Illinois and Kansas in the summer. Submitted by Briita Wanhala, Project Manager.

Performance testing was done in the fall at the MSU Baja SAE track facilities.
ME Senior Electives for 2014-2015

• The following ME Senior Elective list was accurate as of February 28, but it is subject to change. Important changes will be emailed to you with “ME Bulletin Update” on the subject line.
• Design Intensive courses have an asterisk (*) after the course number.
• Descriptions are provided for courses that are not in the catalog. All others can be found by going to http://www.reg.msu.edu/Courses/Search.aspx
• The ME department cannot overfill a required course or section to solve a Senior Elective schedule conflict.
• Instructor assignments had not been finalized when the newsletter went to press. They will be posted later on the Schedule of Courses website.
• Course override instructions can be found in the shaded box on page 15.

SUMMER SEMESTER

ME 490 Independent Study. 1-4 credits. See Override Instruction #2 on page 15. You may reenroll for a maximum of 6 credits.
ME 465* Computer Aided Optimal Design. 3(3-0). Prereq: ME 471 or concurrently. ▶Online Course.

FALL SEMESTER

ME 416* Computer Assisted Design of Thermal Systems. 3(4-0). Prereq: ME 410 or concurrently.
ME 422 Introduction to Combustion. 3(3-0). Prereq: ME 332 or concurrently.
ME 425 Experimental Mechanics. 3(2-3). Prereq: ME 222.
ME 440 Aerospace Engineering Fundamentals. 3(3-0). Prereq: ME 332 or concurrently.
ME 444 Automotive Engines. 3(3-0). Prereq: ME 410 or concurrently.
ME 475* Computer Aided Design of Structures. 3(3-0). Prereq: ME 471 or concurrently.
ME 477 Manufacturing Processes. 3(3-0). Prereq: ME 222, MSE 250, and Tier I Writing.
ME 490 Independent Study. 1-4 credits. See Override Instruction #2 on page 15. You may reenroll for a maximum of 6 credits.
ME 491 Selected Topics in Mechanical Engineering. Section 001: Biomechanical Analysis of Human Movement. See Override Instruction #1 on page 15. Course Description: Experimental methods used in the biomechanics of human movement. Topics will include equipment used for capturing movement (e.g., motion capture, EMG) as well as hands-on experience with typical data sets, writing code in MATLAB to analyze data, and reviewing important studies in the biomechanics literature. Examples of human movement from different contexts (e.g., gait, sports, ergonomics) will be used to provide potential applications of these techniques. Prereq: ME 371. Biomechanical Concentration Course.
ME 494 Biomechanics and Heat Transfer. 3(3-0). Prereq: ME 410 or concurrently. Biomechanical Concentration Course.
CHE 472 Composite Materials Processing. 3(2-3). Prereq: ME 332.
ECE 445 Biomedical Instrumentation. 3(2-3). Prereq: ECE 345. Biomedical Concentration Course.
MSE 476 Physical Metallurgy of Ferrous & Aluminum Alloys. 3(3-0). Prereq: MSE 250. Recommended background: MSE 310. For more info, see Override Instruction #4 on page 15.
ME 812 Conductive Heat Transfer. 3(3-0). See Override Instruction #5 on page 15. Prereq: ME 412 plus GPA of 3.5+.
ME 830 Fluid Mechanics I. 3(3-0). See Override Instruction #5 on page 15. Prereq: ME 332 plus GPA of 3.5+.
ME 860 Theory of Vibrations. 3(3-0). See Override Instruction #5 on page 15. Prereq: ME 461 plus GPA of 3.5+.

SPRING SEMESTER

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 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 471 or concurrently.
OVERRIDE INSTRUCTIONS

1) Complete and submit the ME Override Request Form: [Click on Forms & Handouts]. Please note that the ME department cannot overfill required courses to resolve conflicts with Senior Electives, Other Electives, Integrative Studies courses and employment schedules.

2) 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, 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.

3) Six seats in ECE 415 have been allocated for MEs who are on record as Manufacturing Concentration students. If you are one of those students, send an email to Gaile griffore@egr.msu.edu and request your override. Be sure to include your PID number and mention that you are on record as a Manufacturing Concentration student. (To be “on record,” you must first meet with Gaile to plan a long-term schedule.) ALSO, a prerequisite override will be given to students who will need to take ECE 415 & ME 451 concurrently.

4) ME majors do not need to have taken the Recommended Background courses, but there will probably be a need for some additional background reading. Contact the professor for more information.

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

6) CHE 483—To request an override, go to 2527 EB, and be prepared to show them your I.D. to prove that you are 21 or older.
Spring Semester Calendar

March 10  Scheduled appointments begin for enrollment for Summer 2014.  
Your enrollment access date is posted in StuInfo.
March 28  Computer enrollment begins for Fall 2014 / Spring 2015
April 25  Design Day in the EB. See you there!
April 28-May 2  Final Exams.
May 2  University Undergraduate Student Convocation—1:00 p.m. in Breslin.
May 4  College of Engineering Undergraduate Commencement Ceremony, 12:30 p.m. in Breslin. Lasts about 2 hours.
May 12-June 26  First Summer Session.
Jun 30-Aug 14  Second Summer Session.
May 12-Aug 14  Full Summer Session.
August 7  Initial Fall 2014 Minimum Tuition & Fee payment due.
August 27  Fall Semester classes begin.