MSU recently received $4.5 million in funding to study Osteopathic Manipulative Medicine (OMM). The research is a partnership between National Institutes of Health (NIH) and MSU, and it involves collaboration between two MSU colleges, Osteopathic Medicine and Engineering. The mechanical engineering researchers include (Top row) Prof. Jongeun Choi, Prof. Clark Radcliffe, ME Ph.D. student Cody Priess, EGR freshman Conner Boss, ME senior Kyle Crayne, EGR freshman Justin Rucinski, (Bottom Row) ECE MS student Ahsan Ijaz, ME junior Paul Snyder, and ME MS student Andrey Maslennikov. They are gathered shown around a robotic mechanism for subject testing designed by ME Ph.D. student Cody Priess. Read more about this exciting research on page 6!
ME Bulletin

The ME Bulletin is published once each semester for sophomores, juniors, seniors, faculty and staff of the Department of Mechanical Engineering. It is also published as a PDF file at the following location: http://www.egr.msu.edu/me/undergrad/newsletter

Photos were taken by Craig Gunn unless noted otherwise.

Send all correspondence to:
Gaile Griffioen, Newsletter Editor
Michigan State University
Dept. of Mechanical Engineering
2560 Engineering Building
East Lansing, MI 48824-1226
(Telephone: 517-355-3338)
(E-mail: g Griffioen@egr.msu.edu)

In This Issue
Associate Chair's Corner .............. 2
Special Overrides ..................... 2
Reminders/Advising .................. 3
Grad School ............................. 3
Curriculum News .................... 3
Department News ................... 3
Center News .......................... 4
Study Abroad: Edinburgh .......... 4
Study Abroad: Lyon .................. 5
Study Abroad: Aachen ............... 5
Summer Courses .................... 5
ASME ..................................... 5
COVER STORY .......................... 6
Craig Gunn ............................. 7
Dean's List / May/August Grads 8
Solar Car/Baja .......................... 9
2012-13 Senior Electives .......... 10
Calendar ............................... 12

Safety – whatever.
Spartan Mechanical Engineers are known for translating ideas into reality. Part of this talent comes from the healthy dose of “design, build, and test” in the curriculum. That “build” part can require many hours in the machine shop, the IPL, or the Jolly Road facility, if you are on one of the car teams. Many students come to MSU with significant experience in the shop or garage. Many students don’t gain experience until they get here.

And while you are gaining or enhancing your skills, you must think about safety. Anytime you’re working with tools, safety has to be your primary focus. And safety starts by thinking about what you are doing and being aware of what those around you are doing. Oh, and wearing safety goggles, too. (OSHA requires that you wear eye protection with side shields when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.)

Even people with experience at working in a shop and who have a healthy respect for rotating machinery can have serious accidents. Michele Dufault, a physics and astronomy senior at Yale was experienced at working in the shop. Even so, on 12 April 2011, just a few weeks before graduating, she died when her hair got caught in a lathe. The lathe was found to be without an emergency shut-off. Ms. Dufault was working alone in the evening. She had loose long hair. Each a small thing easily overlooked, but together, a tragic set of circumstances.

If you are experienced in shop practices, you know which actions are safe and which are hazardous. Of course, the person working next to you might be less experienced at using power tools. Or maybe he or she didn’t get enough sleep last night. Or maybe he or she isn’t paying attention. You know what you are doing – does your neighbor?

So, as projects are coming together, and the machine shop and IPL are getting crowded, be sure to pay attention to what you are doing. And what your neighbor is doing. Your team may not be using tools, but you never know when something might come flying. Wear your safety glasses. (And if your advisor moseys down to the shop or IPL, and forgets his or her safety glasses, call ‘em on it.)

If you are the shop floor at you summer internship, or at a job interview, you accept wearing safety glasses. Let’s get into the safety habit here.

Special Overrides

- Transfer Prerequisite Override Requests: If you plan to take the prerequisite for an ME course at another institution this summer, you need to 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/undergrad/forms.

- ME 410 and 412 may be taken concurrently during Summer Semester only, 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 ME 412 concurrently with ME 410 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. Note: You must select a section that has an open seat. You will NOT receive an override for a full section!
Reminders

Class Standing (Rank) information for ME juniors and seniors is available in the ME Advising Office. You will need to present your MSU I.D. card. ME sophomores can obtain this information in 1415 EB.

• ME 280 Honors Section: On April 15, open seats in ME 280H will become available to non-Honors College students with a 3.5+ GPA. If interested, submit the ME Override Request form.

• ME 481–ME Design Projects: ME department approval is required before enrolling in ME 481. To obtain approval, submit the ME 481 Enrollment Approval Form located in the Forms/Handouts link on the ME undergraduate website. ME 481 must be taken during your last semester (or spring semester for August grads). If you do not have a long-term schedule on file, or if your old one needs to be updated, please call 517-355-3338 and schedule an appointment with Gaile.

• ME Graduate Courses: If your GPA is 3.5 or higher, you may be able to take a graduate-level course and apply it to your Senior Electives. To obtain permission, complete a Graduate Course Override form, available in the ME Advising Office. This is a paper form.

• Prerequisites: The ME department expects all students, including members of the Honors College, to observe all course prerequisites. If you have a question, contact the ME Advising Office at 355-3338.

• Schedule Conflicts: The ME department will assist students with conflicts between required courses. However, the department does not overfill required courses to resolve conflicts with Senior Electives, Other Electives, Integrative Studies courses and employment schedules.

Academic Advising

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

2) Most Sophomores (see number 3 below) are advised by Carmellia Davis-King. To schedule an appointment, call 355-6616.

3) Juniors-to-Be with a 3.0+ GPA and ME Juniors and Seniors are advised by Gaile Griffore. For an appointment, call 355-3338, or go to 2560 EB.

Graduate School: Linked Program
by Professor André Bénard, Associate Chair for Graduate Programs

Linked BS-MS Program for Juniors: If you are interested in graduate school, it’s already time to consider using the Linked BS-MS option. You can apply for the Linked BS-MS program in order to use up to 9 credits of qualifying 400-level (and above) classes to count toward the credit requirement of the master’s degree. This effectively reduces the duration of a master’s degree by one semester (or more sometimes). It is important to apply now to allow flexibility in scheduling the three courses during your senior year. This can be combined with a summer research internship in a lab to get a head start on your research.

Stop by the ME graduate office (2418 EB) where Ms. Aida Montalvo can make an appointment with Prof. Andre Benard, ME graduate advisor, to discuss your options at MSU. Much information about pursuing graduate school at MSU can be found under wwwegrmsumedume/graduate

Curriculum News

• CE 422–Applied Hydraulics has been changed to ENE 422.

• ME 372–Machine Tool Lab will be offered fall and spring semesters. Instructor Roy Bailiff. Manufacturing Concentration students are given priority for seats in this course.

• ME 461–Mechanical Vibrations has been changed from 4 to 3 credits, and the lab has been eliminated. IMPORTANT: Check to see if you have to replace the 4th credit of ME 461 with a 1-credit elective so that your degree will have 128 credits.

• ME 465–Computer Aided Optimal Design will be offered next spring, not fall as in the past.

• ME 475–Computer Aided Design of Structures will be offered next fall, not spring as in the past. Also, the lab has been eliminated.

• ME 497–Biomechanical Design has been changed to require (ME 371 or concurrently) as a prerequisite.

• MSE 426–Intro to Composite Materials is in the process of being changed to ME 426. When that happens, it will be announced via email blast and in the ME Bulletin.

Department News

• Dr. Seungik Baek, assistant professor, has received a National Science Foundation (NSF) CAREER Award. Funding from this five-year, $400,000 grant will support his work in cardiovascular mechanics and characterization of biomaterials. The Faculty Early Career Development (CAREER) Award is among the NSF’s most prestigious honors, recognizing young faculty members who are effectively integrating research and teaching.
DID YOU KNOW? 91.26% of ME grads tell us that in 2011 they were placed in a job or grad school?

DID YOU KNOW? ME’s heading to work received offers, on average, of $60,780.14?

• 32.53% received a bonus of $4,759.26
• 77% reported receiving 1.87 offers (83% before graduation)

So, how did they find these jobs?

• Previous Internship/Co-op: 35.9%
• Previous Work Experience: 1.28%
• Other Job Posting Source: 10.26%
• My Spartan Career: 12.82%
• On-Campus Interview: 7.69%
• Career Fair: 26.92%
• Personal Network/Family/Friend: 5.13%

DID YOU KNOW? 97.09% of 2011 ME Grads reported having a co-op/internship?

• Career Based: 86.41%
• Skill Based: 64.08%
• Research: 27.18%

AND...they did a lot of fun things too…

• Study/Work Abroad: 15.53%
• Volunteer: 10.68%

TELL US: What have you been up to? Where have you been? Where are you going?

Stop into the Center and fill out the yellow Internship/Co-op Company Review form and win a Shirt or $10/Sparty Bucks, your choice! (Prizes available until gone).

And as always, if you need help The Center is here to…

• Help You Get Started
• Help You Connect with Employers
• Critique your resume
• Negotiate Your Offer
• And more...

KEEP AN EYE OUT for your invite to complete your Destination (grads) or Summer Survey and help us gather more great data!

All data is from the 2011 MSU College of Engineering Destination Survey.

DID YOU KNOW? 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 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.

Students will have the opportunity to take courses that fulfill their entire Senior Elective requirement (i.e., 12 credits of Senior Electives, including a 3-credit design intensive course). Some examples of courses offered at the University of Edinburgh include:

• Sustainable Energy Group Design Project (Design Intensive)
• Marine Energy
• Manufacturing Technology
• Engineering for Renewable Energy
• Wind Energy
• Polymers and Composite Materials

For more information about this exciting study abroad program, 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
Enroll in Your Summer Classes ASAP!

Enrollment for summer courses begins on March 14, 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 361, 391, 410; MSE 250; STT 351.
- **Second Session:** ME 201, 471; STT 351.
- **Full Session:** ME 412 and 490.

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

Some extension courses, including ISS and IAH, will be offered in the Detroit, Flint, and Grand Rapids areas. In addition, many online courses, including Integrative Studies, will be offered.

**IMPORTANT:** if you decide to 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 2).
MSU-NIH Partnership to Use System Engineering for Medical Research*

MSU recently received $4.5 million in funding for a research program spanning 6 years (09/2010 – 08/2016) to study Osteopathic Manipulative Medicine (OMM). The research is a partnership between National Institutes of Health (NIH) and MSU, and it involves collaboration between two MSU Colleges: Osteopathic Medicine and Engineering. Additional funding, the MSU’s share of $0.5 million, came from the Provost, VP for Research, College of Osteopathic Medicine, College of Engineering and the MSU Center for Orthopedic Research. Project Principal Investigators include faculty from both the College of Osteopathic Medicine and the College of Engineering. Osteopathic Medicine investigators include Jacek Cholewicki, Ph.D.; N. Peter Reeves, Ph.D.; Lisa DeStefano, DO; Tim Francisco, DO; and Jake Rowan, DO. College of Engineering investigators include Jongeun Choi, Ph.D. and Clark Radcliffe, Ph.D. PK Pathak, Ph.D., a biostatistician, from the College of Natural Sciences is also involved with the research.

Research activities will include three projects under the umbrella of the System Science Center for Musculoskeletal Complementary and Alternative Medicine (CAM) Therapies. Our multidisciplinary team of MSU researchers will develop accurate clinical research tools for studying the effects of OMM in patients with neck and low back pain. OMM is a hands-on approach to the diagnosis and treatment of musculoskeletal disorders, focusing on improving patient function and mobility. The main aim of the three current proposed research projects is to characterize changes in neuromuscular function of the back and neck following OMM treatment using a systems science framework. These are universal tools that can be applied to any therapies aimed at neuromuscular and motor control disorders. Once developed, these tools will be available to other clinicians and practitioners wanting to initiate research projects in their respective areas of interest.

Preliminary studies suggest OMM improves postural control in patients with low back and neck pain. However, the mechanisms responsible are unknown. MSU researchers hypothesize OMM targets impaired functions of the neuro-musculoskeletal system.

*This article was co-written by the project’s principal investigators: Clark Radcliffe Ph.D., Jongeun Choi Ph.D., Jacek Cholewicki Ph.D., N. Peter Reeves Ph.D., Lisa DeStefano DO, Tim Francisco, DO and Jake Rowan DO.
The research will use a systems engineering approach to develop functional models, measure patient progress after OMM and produce objective measures of changes in patient function.

Low back pain (LBP) is a common and debilitating medical condition but the vast majority of clinical cases do not have a pathoanatomical diagnosis on the basis of standard clinical tests. Our previous research has shown that, compared with healthy controls, LBP patients have impaired postural control. Furthermore, individuals with a delayed muscle reflex response to sudden trunk loading are known to be at increased risk of sustaining low back injuries. Conservative treatment methods, including pain medication and physical therapy, are generally unsatisfactory. OMM is being chosen by an increasing number of LBP patients. Our preliminary studies suggest that OMM improves postural control in patients with non-specific LBP, who exhibit such impairments when tested with an unstable sitting task.

Neck pain (NP) is one of the three most frequently reported musculoskeletal complaints, affecting 70% of individuals at some point in their lives. One treatment option that appears to be effective in relieving musculoskeletal pain in the head-neck area is OMM. However, in most studies, the measures used to support these findings have been limited to subjective tests such as manual range of motion estimated by therapists, and survey statements provided by patients. Therefore, these past research efforts are not sufficient to accurately determine the effectiveness of the therapy, characterize its mechanisms, or optimize treatment.

The overall goal of the entire project is to develop objective control-oriented performance measures that will be the basis for clinical research tool development. The first aim of this study will be to apply these tools to assess differences in position and force control of the trunk and head-neck systems between patients with either LBP or NP and healthy individuals. The second aim will be to measure changes in position and force control of the trunk and head-neck systems in patients with LBP and NP following OMM. The precise mechanisms of impairment and improvement from OMM will then be studied with the parametric models of the back and neck motor control developed using the data collected from the patients.

The research activities are currently in their second year of development and attract increasing number of undergraduate, graduate, and postgraduate students from both Colleges. This multidisciplinary collaboration serves as a great example of how engineers can help to advance knowledge in the field of medicine.

Keep Social Media in Perspective by Craig Gunn, Director of Communications

I am sure that over the past years there is one thing that has become an integral part of your everyday existence and possibly the dreams that inhabit your sleeping hours. The elements of social media cannot be ignored as you text others while you walk, tweet while you eat your lunch, and populate your Facebook pages with a myriad of material for your many friends. While there is nothing inherently wrong with the world of social media, there is a need to make sure that the social media you use works for you and that you do not become simply a pawn in its web. This requires perseverance and an effort to return to your youth where the many things that you learned will help to make you not only a great engineer but a great communicator.

So what are the things that you picked up as a child that may have been dulled a bit by the influx of social media? Probably one of the greatest things that we might notice is the inability of many people to remember what a simple paragraph is and should contain. Far in the distant past of say the fourth grade we learned to write a paragraph around a central theme with supporting details. When it comes to engineering, that is the foundation for pretty much everything you write. If you look at journals, magazines, and technical reports, you will find that they pretty much all follow the simple rule of a topic sentence and supporting details. The problems arise when the most I ever write is a tweet about some event or person. I don’t get a lot of practice in writing when I don’t write very much. So the first thing that must be understood is that I need to write on a regular basis. I need to express my thoughts and my technical knowledge in a written form that is structured and correct. I can tweet and write for Facebook all I want, but I must spend time making an effort to express my ideas in a form accepted by the world in which I will work. My employers will not ask me to tweet them when I am working on a project. The board of directors will not expect to see my reports on Facebook. They will all expect formal reports written in a technical form with punctuation and language learned in your formative years. They will simply ask you to perform as a professional both in a technical and in a communicative manner. Don’t give up the social media, but also don’t give up what you learned from K-12.
Fall 2011 Dean’s List

Congratulations to the following 214 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

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 March 1. If your name is missing, please contact me immediately at griffone@egr.msu.edu (Tele: 517-355-3338).—Galie

76 Seniors to Graduate in May and August!

May Graduates

Abdus Sami Agha
Khalifa Saeed Al Mansouri
Joshua David Baack
Nilutpol Basumatari
Eric Repko Beatham
Blaine Cameron Benson
Peter James Bentley
Jayson Brenton Blough
Kenneth Brian Bowman
Christopher Gerald Chorny
Dustin Jon Colthorp
Robert James Conley
Andrew Joseph Cooper
Scott Alexander Coy
Kyle James Crayne
Erika L Crosby
Austin Thomas Deneff
Joshua Nicholas Devault
DeAnna Nicole Doan
Jared Ian Dorriven
Matthew Alan Fisher
Bobby Dean Fuentes
Gerald Raymond Gentz
Andrew James Grossman
Scott James Hall
Anthony James Han
Katherine Suzanne Hilton
Tyler Anson Jaynes
Nur Azan Joned
Jeffrey Henry Klegon
Thomas Jacob Klotzbach
Ahra Ko
Peter Norman Koenigschnke
Adithya Kumar Kosgi
Andrew Joseph Kristufek
Nicholas Eric Kuuttila
Ryan William Lureau
Hansen Ma
Charles John Maines
Dane R Marsack
David Ambrose Marsh
Christopher Stanley Matthes
Camille Janey McCalt
Charles Cole McGovern
Jeffrey Robert Narkis

August Graduates

Kyle Blaine Justus
Kim Kyoungho
Yirang Liu

Jonathan Donald Luscakowski
Andrew John Mozer
Brady Robert Thom
Yingxu Wang
Shawn Robert Wright

Modelski, Ming Xu, Timothy Najar, Jeffrey Narkis, Anna Nham, Andrew Nuttall, Michael O’Brien, Scott O’Connor, Patrick Omalley, Ross Otten, Bansari Patel, Sapan Patel, Cody Paupert, Matthew Pawlicki, Brooke Peruski, Matthew Pingel, Isaac Platte, Samantha Poblen, Andrew Potracka, Lauren Prochazka, Nicholas Putman, Daniel Pylar, Jiawei Qin, Joshua Racalla, Shioyukumar Ramanani, Travis Reinhard, Syleia Reiser, Jeremy Ries, Nicholas Righetti, Madeline Roe, Seth Rohr, Todd Sabotta, Justin Sagorski, Adam Sajdak, Alexander Schuen, Peter Schultz, Joseph Senechal, Ankit Sharma, Dylan Sheridan, Andrew Shih, Mark Shuptar, Kyle Silcox, Dylan Simmer, Michael Skierski, Cory Snowdon, Paul Snyder, Steven Soave, Zachariah Sprinkle, Hunter St Pierre, Christopher Stanos, Jamie Steinberger, Isaac Steinbrunner, Yubing Su, Kyle Sweet, Karan Takakkawapally, Joshua Talaga, Gregory Tenbusch, Nicholas Theis, Jason Thelen, Gregory Thomas, Geoffrey Todd, Mariah Trattling, Steven Utz, Douglas Van Meter, Jason Wagnitz, Cory Waltz, Brittany Watton, Kyle Watts, Joshua Whitman, Christopher Wilson, Nicholas Wilson, Matthew Witmer, Peter Woodbridge, Qin Wu, Yan Wu, Yaojing Yang, Evan Yoder, Tianyu Zhao, Benjamin Zondlak.
MSU Solar Car

Last year, the Solar Car Racing Team competed in the Formula Sun Grand Prix for the first time in university history. Not only did we complete the race, but we felt satisfied by the substantial distance our vehicle drove. In the three-day period, Bra-sidius raced nearly 200 miles without any technical malfunctions.

For the 2011-2012 year, the team has been working incredibly hard in preparation for the upcoming competition in July, the American Solar Challenge. The competition is composed of two parts: a 3-day track race in Rochester, New York, followed by a daunting 1600 mile cross-country race from Rochester to St. Paul, Minnesota. If the team successfully passes the initial inspection, this will be the first time that MSU will compete in the American Solar Challenge! Completing improvements in the current vehicle and rigorous testing over the next few months will be a necessary pre-cursor to the challenge.

The team also gratefully acknowledges the recent support given to them by: Northern Tool & Equipment, Owens-Corning Fiberglas, Ford Motor Co., Northrop Grumman, and the MSU College of Engineering. We could not move forward without them! Submitted by James Miller, Project Manager.

Baja SAE

The MSU Baja team is gearing up for another exciting competition season. The team traveled to Houghton, Michi-

gan to compete in the Blizzard Baja Invitational race hosted by Michigan Technological University. We were pleased to have one of our cars place 5th out of 48 entries. With the old cars put away for the season, the team is now going full bore to finish the new car for the first SAE race of the season in Auburn, Alabama on April 19th.

The chassis is nearly completed but much work remains to be done on the powertrain, suspension, steering and driver safety systems.

Anyone who is interested in helping or just curious about what we do should contact Katie Worley at michiganstatebaja@gmail.com. We meet at the Jolly Road machine shop on Saturday and Sunday at 11 am to work on the car. Feel free to come out and see what we are all about. Submitted by Nicholas Kuuttilla, Chief Engineer.

MSU Baja overtaking the competition in the first corner.
Department of Mechanical Engineering

ME Senior Electives for 2011-2012

• The following ME Senior Elective list, including instructor assignments, was accurate as of March 2, 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.asp
• The ME department cannot overfill a required course or section to solve a Senior Elective schedule conflict.
• Course override instructions can be found in the shaded BOX on page 11.

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.

FALL SEMESTER

ME 416* Computer Assisted Design of Thermal Systems. 3(4-0). Prereq: ME 410 or concurrently. Somerton.
ME 422 Introduction to Combustion. 3(3-0). Prereq: ME 332 or concurrently. TBA.
ME 440 Aerospace Engineering Fundamentals. 3(3-0). Prereq: ME 332 or concurrently. Engeda.
ME 444 Automatic Engines. 3(3-0). Prereq: ME 410 or concurrently. Schock.
ME 456* Mechatronic System Design. 3(2-3). Prereq: ECE 345 or concurrently and ME 391 or concurrently. Radcliffe.
ME 475* Computer Aided Design of Structures. 3(3-0). Prereq: ME 471 or concurrently. NOTE: This course has been changed from spring to fall. Diaz.
ME 477 Manufacturing Processes. 3(3-0). Prereq: ME 222, MSE 250, and Tier I Writing. Thompson.
ME 490 Independent Study. 1-4 credits. See Override Instruction #2 on page 15. You may reenroll for a maximum of 6 credits.
ME 494 Biomechanics and Heat Transfer. 3(3-0). Prereq: ME 410 or concurrently. Biomechanical Concentration Course. Wright.

ECE 491 Special Topics. Section 601. Topic: “Acoustics.” 3(3-0). See Override Instruction #4 on page 15. Course Description: Review of Laplace and Fourier transforms, waves in one dimension, the acoustic wave equation, transmission and reflection, radiation and diffraction, absorption and attenuation, cavities and waveguides, resonators and filters. Prereq: (EGR 102 or CSE 131) and (ECE 345). McGough.
ME 812 Conductive Heat Transfer. 3(3-0). See Override Instruction #6 on page 15. Prereq: ME 412 plus GPA of 3.5+. TBA.
ME 830 Fluid Mechanics I. 3(3-0). See Override Instruction #6 on page 15. Prereq: ME 332 plus GPA of 3.5+. TBA.
ME 860 Theory of Vibrations. 3(3-0). See Override Instruction #6 on page 15. Prereq: ME 461 plus GPA of 3.5+. TBA.

SPRING SEMESTER

ME 417* Design of Alternative Energy Systems. 3(3-0). Prereq: ME 410 or concurrently. Somerton.
ME 442* Turbomachinery. 3(3-0). Prereq: ME 332. Mueller.
ME 445* Automotive Powertrain Design. 3(3-0). Prereq: ME 444. Schock.
ME 464 Intermediate Dynamics. 3(3-0). Prereq: ME 361. Shaw.
ME 465* Computer Aided Optimal Design. 3(3-0). Prereq: ME 471 or concurrently. NOTE: This course has been changed from fall to spring. Averill.
ME 477 Manufacturing Processes. 3(3-0). Prereq: ME 222, MSE 250, and Tier I Writing. Thompson.
ME 478 Product Development. 3(3-0). Prereq: ME 477 and Tier I Writing. Kwon.
ME 490 Independent Study. 1-4 credits. See Override Instruction #2 below. You may reenroll for a maximum of 6 credits.
ME 491  Selected Topics in Mechanical Engineering. Section 001: Intro to Computational Fluid Dynamics. See Override Instruction #1 below. Course Description: Theory and application of finite difference and finite volume methods to selected fluid mechanics and heat transfer models including a potential flow model, a compressible flow model and an incompressible Navier-Stokes model. Prereq: ME 410. Jaberi ▶ This course will taught with graduate students who will take the course as ME 840, and who will have different assignments. If you have questions, contact the instructor.

ME 491*: Selected Topics in Mechanical Engineering. Section 602: Intro to Cryogenic Engineering. Requires Override—See #1 Below. Course Description: Cryogenics is the science of engineering of phenomena that occur at a temperature below 120 K. The class will emphasize the engineering aspects of cryogenics including: cryogenic properties of materials, air separation, liquefaction, cryostat design, cryocoolers, two-phase flow, instrumentation, cryogenic safety and the properties of cryogenic fluids. Prereq: ME 410 or concurrently. Weisend.

ME 491*: Selected Topics in Mechanical Engineering. Section 603: International Development: Dialogue; Discovery; Design; Development; Dissemination. Requires Override—See #1 Below. Course Description: Case studies, lectures, group mini-projects, and a major project, in which students will apply design methodologies to create and manufacture a sustainable solution to an engineering problem as might be sited in a developing nation such as India, Peru, or Tanzania. Prereq: ME 410 and ME 471. Thompson.

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

ME 497  Biomechanical Design. 3(3-0). Prereq: ME 371 or concurrently. Biomechanical Concentration Course. Reid-Bush.

BE 445  Biosensors for Medical Diagnostics. 3(3-0). (BS 161) and (CEM 141) and (ECE 345). Biomechanical Concentration Course. Alocila.

ENE 422  Applied Hydraulics. 3(2-2). Prereqs: ME 332. ▶ This used to be CE 422. TBA.

MSE 425  Biomaterials & Biocompatibility. 3(3-0) Prereq: PSL 250 or concurrently and MSE 250. Biomechanical Concentration Course. Baumann.

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

MSE 451  Microscopic & Diffraction Analysis of Materials. 3(2-3). Prereq: PHY 184. Recommended background: MSE 350 & 381. For more info, see Override Instruction #5 below. Lunt, Bieler, or Morelli.


MSE 466  Fracture & Failure Analysis. 3(2-3). Prereq: MSE 250 and Tier I Writing. Recommended background: MSE 320 and 331. For more info, see Override Instruction #5 below. Crimp.

ME 802  Advanced Classical Thermodynamics. 3(3-0). See Override Instruction #6 below. Prereq: ME 412 plus GPA of 3.5+. TBA.

---

OVERIZE INSTRUCTIONS

1) Complete and submit the ME Override Request Form: http://www.egr.msu.edu/me/undergrad/forms. [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 (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.

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) ECE 491/601–ECE Override Request form: https://www.egr.msu.edu/ece/Undergraduate/Override/eceoverride.html

5) 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.

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 12</td>
<td>Scheduled appointments begin for enrollment for Summer 2012. Your enrollment access date is posted in StuInfo.</td>
</tr>
<tr>
<td>March 30</td>
<td>Computer enrollment begins for Fall 2012 / Spring 2013</td>
</tr>
<tr>
<td>April 19</td>
<td>First SAE Baja race of the season in Auburn, Alabama.</td>
</tr>
<tr>
<td>April 27</td>
<td>Design Day in the MSU Union. See you there!</td>
</tr>
<tr>
<td>April 30-May 4</td>
<td>Final Exams.</td>
</tr>
<tr>
<td>May 4</td>
<td>University Undergraduate Student Convocation—1:00 p.m. in Breslin.</td>
</tr>
<tr>
<td>May 6</td>
<td>College of Engineering Undergraduate Commencement Ceremony, 12:30 p.m. in Breslin. Lasts about 2 hours.</td>
</tr>
<tr>
<td>May 14-June 28</td>
<td>First Summer Session.</td>
</tr>
<tr>
<td>July 2-Aug 16</td>
<td>Second Summer Session.</td>
</tr>
<tr>
<td>May 14-Aug 16</td>
<td>Full Summer Session.</td>
</tr>
<tr>
<td>August 9</td>
<td>Initial Fall 2012 Minimum Tuition &amp; Fee payment due.</td>
</tr>
<tr>
<td>September 1</td>
<td>Approximate application deadline for October FE exam. Deadline will be posted at <a href="http://www.ncees.org/Exams/Pages/Exam_schedule.php">http://www.ncees.org/Exams/Pages/Exam_schedule.php</a>.</td>
</tr>
<tr>
<td>August 29</td>
<td>Fall Semester classes begin.</td>
</tr>
</tbody>
</table>