**THE UNIVERSITY OF WISCONSIN-MILWAUKEE**
**College of Engineering and Applied Science**

**F A C U L T Y   M E E T I N G**

**Friday, January 30, 2015**

**A G E N D A**

The January 30, 2015 faculty meeting has been canceled due to a lack of business.

**AUTOMATIC CONSENT BUSINESS**

    A.  Course Changes – See Attachment 1

    B.  Computer Science Curriculum Revisions – See Attachment 2

    C.  Mechanical Engineering Curriculum Revisions – See Attachment 3

*NOTE TO FACULTY:*

*CEAS Faculty legislation allows for the approval of Automatic Consent Business in the absence of a regularly scheduled faculty meeting.  If there is any objection to the above, consideration will be delayed until the next regularly scheduled faculty meeting.*

*Objections to approval of the above must be received by the Secretary of the CEAS Faculty in writing before 1:45 p.m., Friday, January 30, 2015.*

                              John R. Reisel, Secretary
                              CEAS Faculty

JRR
Attachment

COURSE CHANGES


ELECENG 310         SIGNALS AND SYSTEMS, 3 cr., U
                    Analysis techniques for signals and systems in both continuous and
                    discrete time. Signal representation, including fourier and laplace
                    transforms; system definitions and properties.
                    Prereq: ElecEng 305(C) and COMPSCI 240(P).


                              had been


ELECENG 310         SIGNALS AND SYSTEMS, 3 cr., U
                    Analysis techniques for signals and systems in both continuous and
                    discrete time. Signal representation, including fourier and laplace
                    transforms; system definitions and properties.
                    Prereq: ElecEng 305(C).



MECHENG 101         COMPUTATIONAL TOOLS FOR ENGINEERS, 2 cr., U
                    Introduction to the use of spreadsheets and equation solvers. Basic
                    engineering and financial applications using these tools.
                    Prereq: Math 231 (C) or 221 (C)


                              had been


MECHENG 101         COMPUTATIONAL TOOLS FOR MECHANICAL ENGINEERS, 1 cr., U
                    Introduction to the use of spreadsheets and equation solvers. Basic
                    engineering and financial applications using these tools.
                    Prereq: none

## COMPUTER SCIENCE CURRICULUM REVISIONS

Change the language in the BSCS program description from

"Remaining credits to be chosen from natural sciences electives from the GER List"

to

"Remaining credits to be chosen from the natural sciences electives from GER List, except that CompSci 150 may not be used as part of the Natural Science Requirement"

This change will take effect in Fall 2015.

**MECHANICAL ENGINEERING CURRICULUM REVISIONS**

The Mechanical Engineering curriculum is being revised to add a required course "MechEng 101: Computational Tools for Engineers", remove CompSci 151/201 as a required course, and increase the number of required technical elective credits from 14 to 15. These changes are shown on the attached curriculum sheet. The changes will be effective Fall 2015.

# University of Wisconsin – Milwaukee
## College of Engineering and Applied Science
# MECHANICAL ENGINEERING CURRICULUM

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Mechanical Engineering is **128** credits. Students who need background preparation courses may need additional credits.  See information below regarding placement examinations.

## Engineering Core Courses (~~35~~ 34 credits)

| Course | Title | Credits | Prerequisite |
|---|---|---|---|
| EAS 100/MechEng 150 | Freshman Orientation **or** How Things Work (recommended only) | 1-3 | none |
| EAS 200 | Professional Seminar | 1 | none |
| ~~CompSci 151/201~~ | ~~Intro. to Scientific Programming **or** Intro.Computer Programming~~ | ~~3~~ | ~~Math 231 (C)/Math 116 (C)~~ |
| Civ Eng 201 | Statics | 3 | Math 232 |
| Civ Eng 202 | Dynamics | 3 | Civ Eng 201, Math 233 (C) |
| Civ Eng 303 | Strength of Materials | 4 | Civ Eng 201, Math 233 (C) |
| MatlEng 201 | Engineering Materials | 4 | Chem 105 or 102 |
| ElecEng 301 | Electrical Circuits I | 3 | Physics 210 (C) |
| MechEng 101 | Computational Tools for Engineers | 2 | Math 231 (C) or Math 221 (C) |
| MechEng 110 | Engineering Fundamentals I | 4 | Math 231 (C) |
| MechEng 111 | Engineering Fundamentals II | 4 | Math 232 (C), MechEng 110 (P) |
| MechEng 301 | Basic Engineering Thermodynamics | 3 | Math 233, Physics 209 |
| MechEng 320 | Introduction to Fluid Mechanics | 3 | Jr St, MechEng 301 (C), ElecEng 234, Civ Eng 202 |

## *Mechanical Engineering Major (33 credits)

| Course | Title | Credits | Prerequisite |
|---|---|---|---|
| MechEng 321 | Basic Heat Transfer | 4 | Jr St, MechEng 301 |
| MechEng 323 | Fluid Mechanics Laboratory | 1 | Jr St, MechEng 320 |
| Matl Eng 330 | Materials and Processes in Manufacturing | 3 | Matl Eng 201 |
| MechEng 360 | Mechanical Design I | 3 | Ind Eng 101 or MechEng 101, 111, ~~CompSci 151/153/201~~, Civ Eng 202 |
| MechEng 366 | Design of Machine Elements | 4 | ~~IndEng 210 or~~ MechEng 111, Civ Eng 303, MatlEng 201 |
| MechEng 370 | Computer Aided Engineering Laboratory | 2 | MechEng 101, 111 & Ind Eng 210, ~~Comp151/153/201~~ CivEng 202, 303, Elec 234 |
| MechEng 438 | Mechanical Engineering Experimentation | 3 | Sr St, ElecEng 301, MechEng 321, 360, 366, IE 467 |
| Ind Eng 467 | Intro. Statistics for Physical Science and Eng. Students | 3 | Jr St, Math 233 |
| Mech Eng 474 | Introduction to Control Systems | 4 | Sr St, Elec Eng 301, grade of C or better in ElecEng 234 & Civ Eng 202 |
| Mech Eng 479 | Control and Design of Mechatronic Systems | 3 | Sr St, Mech Eng 474 or ElecEng 402 |
| Mech Eng 496/405 | Senior Design Project **or** Product Realization | 3 | MechEng 321, 360, 366, 370 |

## **Mathematics (14 - 16 credits)

(16 credits typical: Math 231,232.233, ElecEng 234)

One of the following **Calculus** sequences must be completed:

| | Credits | Prerequisite |
|---|---|---|
| Math 231-232-233 | 12 | Math placement score, or previous course with at least "C" grade. |
| Or Math 221- 222 (Honors) | 10 | |
| And ElecEng 234   Analytical Methods in Engineering | 4 | Math 233 |

## **Chemistry (5-10 credits)

One of the following courses must be completed:

| | Credits | Prerequisite |
|---|---|---|
| Chem 105 (Suggested) or Chem 102-104 | 5 | Chem 100 with "C" grade or Chemistry placement test |

## Physics (10 credits)

| | Credits | Prerequisite |
|---|---|---|
| Physics 209 & 214 (Lab), and Physics 210 & 215 (Lab) | 10 | Math 232 (C) |

## General Education Requirements

*Distribution Requirements (15 credits)*

| | Credits | Prerequisite |
|---|---|---|
| **Art** | 3 | none |
| **Humanities** | 6 | none |
| **Social Science** | 6 | none |

One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.
*(Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements)*

*Competency Requirements*
**English Composition (0-6 credits)**
The English Composition requirement is satisfied by:
1. Earning a satisfactory score on the English placement test, **or**
2. Earning a grade of C or higher in English 102
3. Transferring a grade of C or better in a course equivalent to English 102 or higher level expository writing course
**Foreign Language (0-8 credits)**   (for new freshman starting fall 1999)
The foreign language requirement can be completed with one of these options:
1. Two years of a single foreign language in high school
2. Two semesters of a single foreign language in college
3. Demonstrate ability by examination

* **Advancement to Major:**  1. Complete MechEng 101, 110, Chem 105 (or 102), Physics 209 & 214, ~~CompSci 201 (or 151)~~. 2. Complete Math 232 (or 222) with "C" or better grade. 3. Complete EAS 200. 4. Complete the English composition requirement. 5. Obtain a 2.33 GPA in all required math, science and engineering courses (Excludes: general education, prerequisites and orientation courses).  **The program may impose major status as a prerequisite for courses numbered 300 or above.**

** **Placement Examinations**:  Students without previous college level credits in Math, Chemistry or English may be required to take placement exams. The results of these tests determine the appropriate course in which to register.  Background prerequisite courses may be required in addition to the courses listed above.

Effective Fall 2015

# Technical Electives--Mechanical Engineering Major (~~14~~ 15 credits)

Mechanical engineering students are required to select a minimum of ~~14~~ 15 credits of technical electives from Groups A, B and C as indicated below.

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**Group A Technical Electives:** Students must select at least 6 credits from this category.

| | | | |
|---|---|---|---|
| MechEng 402 | Thermal-Fluid Engineering | 3 | MechEng 320, MechEng 321 |
| MechEng 420 | Fluid Mechanics | 3 | Jr St, MechEng 320 |
| MechEng 462 | Intermediate Design of Machinery | 3 | Jr St, MechEng 366 |
| MechEng 463 | Introduction to Finite Elements | 3 | ElecEng 234, Civ Eng 303, MechEng 320 (C), 321 (C) |
| MechEng 475 | Vibrations in Mechanical Design | 3 | Sr St, Civ Eng 202, ElecEng 234 |

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**Group B Technical Electives:**

| | | Credits | Prerequisite |
|---|---|---|---|
| Civ Eng 401 | Intermediate Strength of Materials | 3 | Jr St, Civ Eng 303 |
| Ind Eng 455 | Operations Research I | 3 | Jr St, Math 233 |
| MatlEng 380 | Engineering Basis for Materials Selection | 3 | MatlEng 201 |
| MatlEng 410 | Mechanical Behavior of Materials | 3 | Jr St, MatlEng 201 |
| Math 413 | Introduction to Numerical Analysis | 3 | Jr St, Math 233 (C), 234 (C) |
| Math 601 | Advanced Engineering Mathematics | 3 | Jr St, ElecEng 234 or Math 234 |
| Mech Eng 405 | Product Realization[1] | 3 | MechEng 321, 360, 366, 370 |
| MechEng 411 | Heat Transfer | 3 | Jr St, Mech Eng 321 |
| MechEng 415 | Modern Thermo Manufacturing Processes | 3 | Jr St, Mech Eng 321, Civ Eng 303 |
| MechEng 423 | Applied Fluid Mechanics | 3 | Jr St, MechEng 320 |
| MechEng 425 | Aerodynamics of Wind Turbines | 3 | Jr St, MechEng 320, or Cons Instr |
| MechEng 430 | Energy Modeling | 3 | Jr St or Cons Instr |
| MechEng 432 | Internal Combustion Engines | 3 | Jr St, MechEng 301 |
| MechEng 434 | Air Conditioning System Design | 3 | Jr St, MechEng 321, ~~Ind Eng 210~~ |
| MechEng 435 | Power Plant Theory and Design | 3 | Jr St, MechEng 301 |
| MechEng 436 | Solar Engineering | 3 | Jr St, MechEng 301 |
| MechEng 455 | Processing of Plastics | 3 | MechEng 320,321 |
| MechEng 456 | Metal Casting Engineering | 3 | Jr St, MatlEng 201 |
| MechEng 457 | Engineering Composites | 3 | Jr St, MatlEng 201 |
| MechEng 460 | Nanomaterials and Nanomanufacturing | 3 | Jr St, MatlEng 201 |
| MechEng 461 | Intermediate Kinematics and Dynamics | 3 | Jr St, MechEng 360 |
| MechEng 465 | Friction and Wear | 3 | Jr St, MatlEng 201 |
| MechEng 466 | Mechanics of Composite Materials | 3 | Jr St, CivEng 303 |
| MechEng 469 | Introduction to Biomechanical Engineering | 3 | Sr St, CivEng 202 |
| MechEng 472 | Introduction to Wind Energy | 3 | Jr St or Cons Instr |
| MechEng 476 | Introduction to Robotics | 3 | ElecEng 234, MechEng 360 |
| MechEng 490 | Topics in Mechanical Engineering | 1-3 | Jr St, Cons Instr |
| MechEng 574 | Intermediate Control Systems | 3 | Sr St, MechEng 474 |
| MechEng 580 | Engineering Analysis in Applied Mech. | 1-3 | Jr St, ElecEng 234 |
| MechEng 584 | Biodynamics of Human Motion | 3 | Jr St, ElecEng 234, Civ Eng 202 (C) |
| MechEng 699 | Independent Study | 1-3[2] | |

[1] Credits for group B count if course not used as a substitution for ME 496.
[2] Students who earn **3 or more** credits of MechEng 699 may use only 3 of those credits as approved Group B electives.

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**Group C Technical Electives:** Students may take up to maximum of 3 credits in this category.

| | | | |
|---|---|---|---|
| EAS 001 | Co-op Work Period | 3 | none |
| BusAdm 447 | Entrepreneurship | 3 | Jr St, BusAdm 350(P) |
| EAS 497 | Study Abroad | 3 | none |
| Ind Eng 360 | Engineering Economic Analysis | 3 | Jr St. |
| MechEng 490 | Professional development topics such as Innovation and Commercialization, Tech Comm for Engg and Science | 3 | Jr St, Cons Instr |
| MechEng 542 | Introduction to Technological Entrepreneurship | 3 | Jr St, admission to major |
| MechEng 543 | Intro to Tech Mgmt and Innovation | 3 | Jr St, admission to major |
| MechEng 544 | New Product Development | 3 | Jr St, admission to major |
| MechEng 546 | Global Innovation Management | 3 | Jr St, admission to major |
| MechEng 548 | Technology Venturing Project | 3 | Jr St, MechEng 542, admission to major |

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**Degree Requirements:** Students must maintain an average GPA of at least 2.0 on all work attempted at the University and in all courses offered by the College. Students majoring in Mechanical Engineering must maintain an average GPA of at least 2.5 in all 300-level and above courses in the Mechanical Engineering department. Transferable courses will be included as appropriate. Advancement to major status is required for graduation.

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Effective Fall 2015