

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

FACULTY MEETING

Friday, November 6, 2020 10:30 A.M. Virtually Via Microsoft Teams

AGENDA

I. DEAN UPDATE

II. ANNOUNCEMENTS

III. INFORMAL REPORTS – See Attachment 1

A. Opportunity for questions regarding Informal Reports

IV. DETERMINATION OF THE PRESENCE OF A QUORUM FOR FACULTY MEETING

V. AUTOMATIC CONSENT BUSINESS

A. Minutes of the October 2, 2020 meeting

B. New Courses and Course Changes – See Attachment 2

C. Materials Engineering Program Changes – See Attachment 3

D. Environmental Engineering Program Changes – See Attachment 4

VI. NEW BUSINESS

A. Materials Engineering Honors in Major – See Attachment 5

VII. GENERAL DISCUSSION

VIII. ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

INFORMAL REPORTS

Office of Student Services – Todd Johnson

Fall 2020 Enrollment Summary

CEAS Total: 2,067 -3.5%

Undergrad: 1,719 -2.0%

Graduate: 348 -10.3%

Below is the *CEAS Enrollment Facts at a Glance* report for Fall 2020. This is the link to the full UWM report:

<https://uwm.edu/institutional-research/reports/enrollment/semester-enrollment/>

Table 1: Enrollment Facts At A Glance Engineering & Applied Science

Fall 2020

	UWM			UGRD				GRAD				
	Total	Freshman	Sopho - more	Junior	Senior	Special	Total	Master	Doctoral	Non Degree	Total	
MAIN												
Total	2,067	207	350	367	793	2	1,719	166	176	6	348	
Men	1,685	174	293	305	655	1	1,428	119	133	5	257	
Women	382	33	57	62	138	1	291	47	43	1	91	
Residents	1,561	173	289	302	655	2	1,421	93	42	5	140	
Non Residents	493	34	58	63	130		285	73	134	1	208	
Minnesota Recip	13		3	2	8		13					
African Amer	47	6	8	11	18		43	2	2		4	
Amer Indian	1			1			1					
Latino/a	53	11	11	11	18		51	2			2	
SE Asian Amer	58	7	15	14	18	1	55	2	1		3	
Multi Ethnic Targeted	214	20	35	41	105		201	12	1		13	
Targeted Subtotal	373	44	69	78	159	1	351	18	4		22	
Asian Amer	99	15	24	13	31		83	7	8	1	16	
International	298	8	14	17	59		98	72	128		200	
Other Race	1								1		1	
Multi Ethnic Not Targeted	33	2	10	3	16		31	1	1		2	
White	1,249	137	232	254	524	1	1,148	67	31	3	101	
Unknown	14	1	1	2	4		8	1	3	2	6	
Average Age	23.8	18.5	20.0	21.9	25.1	29.5	22.6	27.6	32.4	33.0	30.1	
Age 25+ Men	529	3	12	43	257		315	79	132	3	214	
Age 25+ Women	118	1	2	5	41	1	50	26	41	1	68	
New	254	179	13				192	41	18	3	62	
First Generation Student	550	57	114	121	258	0	550	0	0	0	0	
Continuing	1,661	19	287	322	747	2	1,377	124	157	3	284	
Reentry	34		6	6	20		32	1	1		2	

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Fall 2020

	UWM		UGRD				GRAD			Total	
	Total	Freshman	Sopho	Junior	Senior	Special	Total	Master	Doctoral		Non Degree
Online Only	641	19	93	108	239	1	460	107	68	6	181
FTE	1,781	200	326	336	671	0	1,533	96	150	2	248
Average Credits	12.2	14.5	14.0	13.7	12.7	3.0	13.4	7.0	6.0	3.0	6.4
Full Time	1,577	200	323	322	606		1,451	77	49		126
Part Time	490	7	27	45	187	2	268	89	127	6	222

- more

Career Services – Juli Pickering

Fall 2020 Virtual Industry Expo Career Fairs

Due to the pandemic and for the safety of both students and employers, the Fall 2020 Industry Expos were held virtually and on two separate days:

- Fall Engineering & Computer Science Industry Expo: Friday, October 2, 2020
- Civil & Environmental Engineering Industry Expo: Friday, October 9, 2020

A total of 75 employers attended the event. While this number is lower than the number of companies participating in Fall 2019, the other campus career fairs had fewer employers participate (64: Lubar School of Business; 61 Campus-wide Career Fair).

Students met with employers in Group and 1:1 Sessions. In total, 55% of the 1:1 sessions were filled, compared to 39% of sessions for the Lubar Career Fair and 40% of the Campus-wide Career Fair.

Student survey feedback for the Fall Industry Expos is as follows:

Please rate the following: (5: Excellent, 4: Very Good, 3: Good, 2: Fair, 1: Poor)

- Ease of Registration: 4.69
- Ease of Signing up for Sessions: 4.42
- Quality of Interactions with Employers: 4.18
- Overall Benefit of Participating: 4.18

Full survey results are available upon request. Please contact Juli Pickering (jlpicker@uwm.edu).

Thank you, faculty, for sharing the Expo Handout on course Canvas sites. Students did utilize the information in addition to videos and emails created by Career Services. Additional thanks to Jennie Klumpp, Tina Current and Sharon Kaempfer who managed the Teams meeting rooms for student questions the day of the event.

Curriculum Committee – Prof. Church

Several curricular issues were passed, and are up for approval at this meeting. There was also a discussion regarding working more closely with the College of General Studies, but no action was taken on this topic.

Graduate Program Committee – Prof. Law

No Report

Academic Planning Committee – Prof. ?

No Report

Faculty Senate – Prof. Reisel

In October, the Faculty Senate approved the Authorization to Implement the B.S. in Data Science. The Senate also heard an update on the 2030+ Think Tank Research Group suggestions. Currently, an implementation team is developing plans for how the 2030+ Think

Tank's recommendations will be implemented. If you have not been following the 2030+ Think Tank and its recommendations, it is recommended that you familiarize yourself with the project, as there may be major changes to the campus that come out of this project. The 2030+ Think Tank report can be found at <https://uwm.edu/chancellor/wp-content/uploads/sites/290/2020/06/Think-Tank-2030-Final-Report-20200528.pdf>

NEW COURSES

COMPSCI 594 CAPSTONE PROJECT PREPARATION, 1 cr. U
In this course the student teams will develop the requirements & functionality specifications for their capstone projects and conduct the necessary research on the prior art & technologies to be used.
Prereq: sr st.

COURSE CHANGES (Additions made in green. Deletions Indicated in Red)

CIV ENG 203 INTRODUCTION TO SOLID MECHANICS, 4 cr., U
Topics in statics and strength of materials, including vector mechanics, equilibrium, structural analysis, internal forces, friction, moment of inertia, centroids, stress, strains, torsion, beam bending, shear and moment diagrams, deflection, and stress transformation.
Prereq: MATH 231(C) and sophomore standing. ~~MATH-232(P).~~

CIV ENG 250 ENGINEERING SURVEYING, 3 cr., U
Horizontal and vertical distance measurement, angles and direction, traverses, errors, control and construction surveys, coordinate systems, land records, and coordinate geometry. Office and field practice.
Prereq: soph st and st, Math 231(C). ~~232(P).~~

COMPSCI 595 CAPSTONE PROJECT, 43 cr., U
Students will integrate their knowledge of the undergraduate computer science curriculum by implementing a significant computer science team project.
Prereq: sr st, CompSci 351 (P), CompSci 361 (P), and credit in at least 6 credits of 400 or higher CompSci or ElecEng courses.

ATTACHMENT 3

MATERIALS ENGINEERING PROGRAM CHANGES

The marked-up revised curriculum sheet can be found on the following pages.

Proposed

**University of Wisconsin – Milwaukee
College of Engineering and Applied Science**

MATERIALS ENGINEERING CURRICULUM

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Materials Engineering is **124 120** credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (24 21 credits)

Credits Prerequisite

Civ Eng 201	Statics	3	Math 232
CivEng 203	Introduction to Solid Mechanics	4	Math 233 (C)
Civ Eng 202	Dynamics	3	Civ Eng 203, Math 233 (C)
Civ Eng 303	Strength of Materials	4	Civ Eng 201, Math 233 (C)
CompSci 240	Introduction to Engineering Programming (recommended) Or CS151, CS153, CS202, CS250	3	Math Placement Code of 40 or Math 116(P).
EAS 200	Professional Seminar	1	none
ElecEng 301	Electrical Circuits 1	3	Physic 210 (C)
Ind Eng 367	Introductory Statistics for Physical Sciences and Engineering Students	3	Jr St, Math 233
MatlEng 201	Engineering Materials	4	Math 231(C), Chem 100 with "C" grade or Chemistry placement test

Materials Engineering Major (28 credits)

MatlEng 316	Thermodynamics of Materials	3	Jr St, MatlEng 201
MatlEng 330	Materials and Processes in Manufacturing	3	MatlEng 201
MatlEng 402	Physical Metallurgy	3	Jr St, MatlEng 201
MatlEng 410	Mechanical Behavior of Materials	3	Jr St, MatlEng 201
MatlEng 411	Materials Laboratory	3	Sr St, MatlEng 201
MatlEng 443	Transport Phenomena in Materials Processing	3	Jr St, MatlEng 316, ElecEng 234
MatlEng 452	Ceramic Materials	3	Jr St, MatlEng 201
MatlEng 453	Polymeric Materials	3	Jr St, MatlEng 201
MatlEng 490	Senior Design Projects - I	1	Sr St, MatlEng 411 (C)
MatlEng 491	Senior Design Projects - II	3	MatlEng 490

***Mathematics (14-16 credits)**

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

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 (recommended) or Math 234	4	Math 233

***Chemistry (5-10 credits)**

One of the following sequences must be completed:

Chem 105 (Suggested) or Chem 102 -104	5	Chem 100 with "C" grade or Chemistry placement test
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Physics (10 credits)

219 - 220 (recommended)	10	See Schedule of Classes
or Physics 209 & 214 – 210 & 215	10	See Schedule of Classes

General Education Requirements

Distribution Requirements (15 credits)

Art	3	none
Humanities	6	one
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)

Free Elective 2 1

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 (3 credits or more) 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

***Placement Examinations**

Once admitted to UWM, most engineering students are required to take placement examinations in mathematics, English and chemistry. Students with previous college level credits in these areas may not be required to take placement exams. The placement exams are administered by the UWM Testing Center, Mellencamp Hall, room B28, (414) 229-4689. The results of these tests help students determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above. Possible Math placements for engineering students are Math 090-095-105-116-117-225-231-221. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100, 102 or 105.

Technical Electives--Materials Engineering Major

The materials engineering program requires a minimum of 24 credits of technical electives, chosen from the following lists. At least 18 of the credits of technical electives must be from Group A1 and A2 as outlined below.

Group A1 Technical Electives (Structure): Select at least 2 courses.

		<u>Credits</u>	<u>Prerequisite</u>
MatlEng 380	Engineering Basis for Materials Selection	3	MatlEng 201
MatlEng 461	Environmental Degradation of Materials	3	Jr St, MatlEng 201
MatlEng 465	Friction and Wear	3	Jr St, MatlEng 201
MatlEng 481	Electronic Materials	3	Jr St, MatlEng 201
MatlEng 483	Materials for Energy Systems	3	Jr St, MatlEng 201
MatlEng 485	Introduction to Biomaterials	3	Jr St, MatlEng 201
MatlEng 511	Advanced Materials Characterization	3	Jr St, MatlEng 201

Group A2 Technical Electives (Processing): Select at least 2 courses.

		<u>Credits</u>	<u>Prerequisite</u>
MatlEng 431	Welding Engineering	3	Jr St, MatlEng 201
MatlEng 456	Metal Casting Engineering	3	Jr St, MatlEng 201
MatlEng 457	Engineering Composites	3	Jr St, MatlEng 201
MatlEng 460	Nanomaterials and Nanomanufacturing	3	Jr St, MatlEng 201
MatlEng 471	Heat Treatment of Materials	3	Jr St, MatlEng 201

Group B Technical Electives: Select no more than 6 credits

		<u>Credits</u>	<u>Prerequisite</u>
EAS 001	Co-op Work Period	3 ¹	none
English 206	Technical Writing	3	Soph St, Completion of Eng Comp
Ind Eng 112	Engineering Drawing & Computer Aided Design/Drafting	3	Math 116
MatlEng 699	Independent Study	3	Jr St, Cons Instr
MechEng 110	Engineering Fundamentals I	4	Math 231 (C)
MechEng 111	Engineering Fundamentals II	4	MechEng 110

Any Physics course 250-level or above
Chemistry 104, 221, any Chemistry course 300-level or above
Any College of Engineering course 300-level or above
Any Mathematics course 300-level or above
Any Biology course 150-level or above
Any Geoscience course 300-level or above
English 428, 429, 435

Other appropriate courses by permission of the department chair.

¹Students who earn 3 or more credits of Co-op may use 3 of those credits as approved technical electives.

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University of Wisconsin – Milwaukee
P.O. Box 784
Milwaukee, WI 53201

Office of Student Services (414) 229-4667
Engineering & Mathematical Science Building (EMS) Room E386

Department of Materials Engineering (414) 229-5181
Engineering & Mathematical Science Building (EMS) Room E1181

Web Site: www.ceas.uwm.edu

ENVIRONMENTAL ENGINEERING PROGRAM CHANGES

- **Programmatic Curriculum (120 credits)**

Students will be required to take at least 120 credits to fulfill the requirements of the program. As indicated in the table below, this includes 27 credits in engineering core courses, 26 credits in the environmental engineering major, 14 -16 credits in mathematics, 5 credits in chemistry 8 credits in physics, 7 credits in other natural sciences and 15 in GER courses. Remaining 18 credits are assigned to four specialized courses that students may select according to their interests. Some of these students may select a track in higher education while some other may select a broader spectrum and tracks in industrial applications. There will be more courses added to this group as the program expands.

Engineering Core Courses (27 credits)	EAS 200 Professional Seminar (1) (<u>Pre: none</u>) Ind Eng 111 Introduction to Engineering (3) (<u>Pre: Math 116 (c)</u>) Ind Eng 112 Engineering Drawing & Computer Aided Design/Drafting (3) (<u>Pre: Math 116</u>) Ind Eng 360 Engineering Economic Analysis (3) (<u>Pre: Jr St</u>) Ind Eng 367 Introductory Statistics for Physical Science and Engineering (3) (<u>Pre: Math 226 or 231, CompSci 132 or equivalent</u>) Civ Eng 203 Introduction to Solid Mechanics (3) (<u>Pre: Math 233(C)</u>) MatlEng 201 Engineering Materials (4) (<u>Pre: chem 105 or 102 or 117</u>) MechEng 301 Basic Engineering Thermodynamics (3) (<u>Pre: Math 233, Physics 209</u>) MechEng 320 Introduction to Fluid Mechanics (3) (<u>Pre: MechEng 301(c), ElecEng 234, CivEng 202 or Physics 209</u>)
Environmental Engineering Major (26 credits)	Civ Eng 311 Introduction to Energy, Environment and Sustainability (3) (<u>Pre: Jr St</u>) Civ Eng 411 Engineering Principles of Water Resources Design (3) (<u>Pre: Jr St, MechEng 320</u>) Civ Eng 413 Environmental Engineering (3) (<u>Pre: Jr St</u>) Civ Eng 412 Applied Hydrology (3) (<u>Pre: Jr St, MechEng 320, Math 233</u>) Civ Eng 521 Water Quality Analysis (3) (<u>Pre: Jr St, CivEng 411</u>) Civ Eng 610 (3) Introduction to Water and Sewage

	<p>Treatment (<i>Pre: Sr St, CivEng 413</i>)</p> <p>Civ Eng 614 (3) Hazardous Waste Management (<i>Pre: jr st; CivEng 413</i>)</p> <p>Civ Eng 494 Principles of Civil Engineering Designs (1) (<i>Pre: Sr St</i>)</p> <p>Civ Eng 495 Environmental Senior Design (4) (<i>Pre: CivEng 411, 413, 494, 311, 412, 521</i>)</p>
Mathematics (14~16 credits)	<p>One of the following Calculus sequences must be completed Math 231-232-233 (12) OR Math 221-222(Honors) (10), <u>(Pre: Math placement score, or previous course with "C" grade)</u></p> <p>ElecEng 234 Analytical Methods in Engineering (4) (<u>Pre: Math 233 (P)</u>)</p>
Chemistry (5-10 credits)	Chem 105 (<u>Pre: Chemistry placement test</u>)
Physics (8 credits)	Physics 209-210
Other Natural Sciences (7 credits)	<p>Bio Sci 150-level (4) (required)</p> <p>Bio Sci 150-level or above (3)</p> <p>Any Geo Sci course 300-level or above (3)</p> <p>Atm Sci 330 (3)</p>
General Education Requirements (15 credits)	<p>Art (3)</p> <p>Humanities (3)</p> <p>Social Science (6)</p> <p>English 310 (3)</p>

Technical Electives (18)

- Comp Sci 240 Introduction to Engineering Programming (3) (Pre: Math Placement Code of 40 or Math 116 (P))
- Civ Eng 303 Strength of Materials (*Pre: CivEng 201, Math 233*)
- Civ Eng 335 Soil mechanics (Pre: CivEng 303 or CivEng 203)
- Civ Eng 490 Transportation engineering (Pre: CivEng 280, Jr. St)
- Civ Eng 492 Environmental Impact Assessment (Pre: Sr St)
- Civ Eng 511 Water Supply and Sewage (3) (Pre: Jr St, CivEng 411)
- Civ Eng 555 Sustainable Construction Materials and Technology (Pre: Jr St)
- Civ Eng 480 Software Applications for Civil Engineering (Pre: Jr St)

- Civ Eng 616 Computational Hydraulics and Environmental Flows (Pre: Jr St, CivEng 411)
- GEOG 215 Introduction to geographic information systems (Pre: None)
- Urb Plan 591 Introduction to Urban Geographic Information Systems (Pre: Jr St)
- GEOSCI 400 Water quality (Pre: jr st; Chem 102(P); Math 232(P); or cons instr.)
- GEOG 403 Remote sensing (focus on hydrology?) (Pre: Jr St & Geog 215)
- GEOSCI 464/FRSHWTR 464 Chemical hydrogeology (Pre: jr st; Chem 102(P).)
- GEOSCI 562 Environmental Surface Hydrology (Pre: jr st; Math 232(P); or cons instr.)
- FRSHWTR 502 Aquatic ecosystem dynamics (Pre: jr st; 1 sem calculus or algebra; 2 sem Physics, Chem, or Bio Sci; or cons instr.)
- FRSHWTR 504 Quantitative freshwater analysis (Pre: jr st; 1 sem calculus, Physics, Chem, & Bio Sci; or cons instr.)
- FRSHWTR 506 Environmental health of freshwater ecosystems (Pre: jr st)
- FRSHWTR 510 Economics, Policy & Management of Water (Pre: jr st)
- ElecEng 430/Mech Eng 430 Energy Modeling (Pre: jr st or cons instr)
- Ind Eng 455 Operations research (Pre: jr st; Math 233(P))
- Matl Eng 460 Nanomaterials and Nanomanufacturing (Pre: jr st; MatlEng 201(P))
- Mech Eng 321 Basic Heat Transfer (Pre: jr st; MechEng 301(P))
- Mech Eng 436 Solar Engineering (Pre: jr st; MechEng 301 (P))
- PH 303: Climate Change, the Environment, and Human Health (Pre: Sophomore standing)
- EAS 001: Co-op Work Period (Pre: none)

(New courses as technical electives in the future)

- Civ Eng XXX Environmental fluid mechanics
- Civ Eng XXX Water resources management
- Civ Eng XXX Built environment
- Civ Eng XXX Air Quality (New faculty needed)

Time to Degree

Students taking 15 credits per semester can finish the requirements in eight semesters. Students taking 12 credits per semester can finish the requirements in 10 semesters. Since engineering students are encouraged to co-op, this may add another year to their graduation time.

Summary of the revision:

- Removed Comp Sci 240 from Engineering core to technical elective. Considering that new FE on longer needs tests in computer programming.
- Removed Civ Eng 511 from Environmental Core to technical elective. Historically the enrollment in this course has been relatively low. Moreover, one faculty in water resources area retired.
- Revised CE614 from 4-credit to 3-credit.
- Replaced CE280 with Indy Eng 367, which is a change made to the Civil Engineering department curriculum change

- Added 3 credit in technical elective requirement. Total required credits for degree increased to 120.
- ~~Eliminated option of Chem102-104 in Chemistry requirement.~~

HONORS IN THE MATERIALS ENGINEERING MAJOR

Students in the Materials Engineering major who meet all the following criteria can be awarded honors in the major upon graduation:

- I. A 3.000 cumulative GPA in all UWM graded credits;
- II. A 3.500 GPA over all CEAS courses counting toward the Materials Engineering major
- III. A 3.500 GPA over all upper-division (300 level and higher) Materials Engineering (Matleng) courses; and
- IV. At least one of the following:
 - a. Successful completion of 3-cr of research experience via independent study (Matleng 699), subject to approval by the supervising faculty and department chair.
 - b. Participation in accelerated MS program with successful completion of 6 credits in approved Matleng courses for the MS program.

Students who believe they may qualify for honors in Materials Engineering should apply to the College of Engineering & Applied Science during their last semester of study.