

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

FACULTY MEETING

Friday, December 13, 2019 10:30 A.M. EMS E180

AGENDA

I. DEAN UPDATE

II. ANNOUNCEMENTS

A. Update on HR policies on sexual misconduct

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 November 8, 2019 meeting

B. New Course and Course Change – See Attachment 2

C. Graduation

"The faculty recommends to the Board of Regents those students whose names are submitted by the Office of the Registrar as having completed the requirements for the degree of Bachelor of Science in their respective majors."

VI. NEW BUSINESS

A. Materials and Structures Certificate Program – See Attachment 3

VII. GENERAL DISCUSSION

VIII. ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

INFORMAL REPORTS

Office of Student Services – Todd Johnson

Enrollment figures for both CEAS and the UW System can be found on the following pages.

Career Services – Juli Pickering

No Report

Curriculum Committee – Prof. A. Rahman

No Report

Graduate Program Subcommittee – Prof. Suzuki

No Report

Academic Planning Committee – Prof. Patrick

No Report

Faculty Senate – Prof. Reisel

In the November meeting, the Faculty Senate approved a resolution to the Board of Regents regarding the composition of the UW System President Search and Screen Committee. The committee has no faculty or staff on it, and the UWM Faculty Senate (along with other campuses in the system) have asked the Board of Regents to add faculty and staff to the committee.

University of Wisconsin--Milwaukee

Headcount Enrollments By Field of Study, Plan Type
Fall 2019

Engineering & Applied Science

Applied Computing

			Total	Sophomore	Junior	Senior
Total			34	4	12	18
UGRD	MAIN	Declared Majors	34	4	12	18
		Total	34	4	12	18

Biomedical Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			144	21	35	26	62
UGRD	MAIN	Intended Majors	31	18	10	3	
		Declared Majors	113	3	25	23	62
		Total	144	21	35	26	62

Civil Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			265	21	59	49	136
UGRD	MAIN	Intended Majors	46	21	17	6	2
		Declared Majors	219		42	43	134
		Total	265	21	59	49	136

Computer Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			98	23	25	18	32
UGRD	MAIN	Intended Majors	30	18	8	4	
		Declared Majors	68	5	17	14	32
		Total	98	23	25	18	32

Computer Science

			Total	Freshman	Sophomore	Junior	Special	Senior	Master	Non Degree
Total			465	67	88	87	1	147	72	3
UGRD	MAIN	Intended Majors	113	56	34	16		7		
		Declared Majors	243	11	49	63		120		
		Minors	34		5	8	1	20		
		Total	390	67	88	87	1	147		
GRAD	MAIN	Declared Majors	72						72	
		Specials	3							3
		Total	75						72	3

Electrical Engineering

			Total	Freshman	Sophomore	Junior	Special	Senior
Total			232	27	46	41	1	117
UGRD	MAIN	Intended Majors	42	24	12	3		3
		Declared Majors	185	3	34	38		110

University of Wisconsin--Milwaukee

**Headcount Enrollments By Field of Study, Plan Type
Fall 2019**

Engineering & Applied Science

Electrical Engineering

			Total	Freshman	Sophomore	Junior	Special	Senior
		Minors	5				1	4
		Total	232	27	46	41	1	117

Engineering

			Total	Freshman	Sophomore	Junior	Special	Senior	Master	Doctoral
Total			357	37	14	3	6	2	127	161
UGRD	MAIN	Intended Majors	51	37	10	3		1		
		Declared Majors	5		4			1		
		Specials	6				6			
		Total	62	37	14	3	6	2		
GRAD	MAIN	Declared Majors	288						127	161
		Specials	7							
		Total	295						127	161

Industrial Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			97	3	16	20	58
UGRD	MAIN	Intended Majors	13	3	5	3	2
		Declared Majors	84		11	17	56
		Total	97	3	16	20	58

Materials Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			49	4	5	12	28
UGRD	MAIN	Intended Majors	6	4	1		1
		Declared Majors	43		4	12	27
		Total	49	4	5	12	28

Mechanical Engineering

			Total	Freshman	Sophomore	Junior	Senior
Total			484	61	101	70	252
UGRD	MAIN	Intended Majors	93	58	23	8	4
		Declared Majors	390	3	78	62	247
		Minors	1				1
		Total	484	61	101	70	252

Medical Informatics

			Total	Doctoral
Total			20	20
GRAD	MAIN	Declared Majors	20	20
		Total	20	20

University of Wisconsin--Milwaukee

Headcount Enrollments By Field of Study, Plan Type
Fall 2019

Engineering & Applied Science

Structural Engineering

			Total	Junior	Senior
Total			5	2	3
UGRD	MAIN	Minors	5	2	3
		Total	5	2	3

Web Development

			Total	Sophomore	Junior	Special	Senior
Total			7	2	1	1	3
UGRD	MAIN	Certificates	7	2	1	1	3
		Total	7	2	1	1	3

Graduate School

Graduate School

			Total	Non Degree
Total			1	1
GRAD	MAIN	Certificates	1	1
		Total	1	1

Helen Bader School Soc Welfare

Criminal Justice

			Total	Freshman	Sophomore	Junior	Senior	Master
Total			596	131	152	128	156	29
UGRD	MAIN	Intended Majors	51	37	12	2		
		Declared Majors	485	94	140	115	136	
		Minors	24			10	14	
		Certificates	7			1	6	
		Total	567	131	152	128	156	
GRAD	MAIN	Declared Majors	29					29
		Total	29					29

Social Welfare

			Total	Doctoral
Total			9	9
GRAD	MAIN	Declared Majors	9	9
		Total	9	9

Social Work

			Total	Freshman	Sophomore	Junior	Senior	Master	Doctoral	Non Degree
Total			707	53	90	88	121	328	2	25
UGRD	MAIN	Intended Majors	244	53	89	74	28			
		Declared Majors	108		1	14	93			

Fall Semester Enrollment Comparison with Prior Year

Preliminary

This table is a report of the Fall 2019 Preliminary Enrollment for the University of Wisconsin System. It includes enrollment for each campus and provides breakouts for main and branch campuses. All figures are preliminary and may be subject to some change as they are finalized.

	Total Headcount			
	2018 Final	2019 Prelim	2019 Prelim to 2018 Final	% Change
UW-Madison	44,116	44,995	879	2.0%
UW-Milwaukee	27,444	26,167	-1,277	-4.7%
<i>Milwaukee Campus</i>	24,933	24,021	-912	-3.7%
<i>Washington County Campus</i>	744	605	-139	-18.7%
<i>Waukesha Campus</i>	1,767	1,541	-226	-12.8%
UW-Eau Claire	11,547	11,201	-346	-3.0%
<i>Eau Claire Campus</i>	10,905	10,767	-138	-1.3%
<i>Barron County Campus</i>	642	434	-208	-32.4%
UW-Green Bay	8,581	8,873	292	3.4%
<i>Green Bay Campus</i>	7,383	8,098	715	9.7%
<i>Manitowoc Campus</i>	311	218	-93	-29.9%
<i>Marinette Campus</i>	306	198	-108	-35.3%
<i>Sheboygan Campus</i>	581	359	-222	-38.2%
UW-La Crosse	10,579	10,589	10	0.1%
UW-Oshkosh	16,424	15,299	-1,125	-6.8%
<i>Oshkosh Campus</i>	14,216	13,732	-484	-3.4%
<i>Fond du Lac Campus</i>	579	435	-144	-24.9%
<i>Fox Cities Campus</i>	1,629	1,132	-497	-30.5%
UW-Parkside	4,325	4,413	88	2.0%
UW-Platteville	8,966	8,100	-866	-9.7%
<i>Platteville Campus</i>	8,106	7,597	-509	-6.3%
<i>Baraboo Sauk County Campus</i>	494	348	-146	-29.6%
<i>Richland Campus</i>	366	155	-211	-57.7%

	Total Headcount (continued)			
	2018 Final	2019 Prelim	2019 Prelim to 2018 Final	% Change
UW-River Falls	6,139	6,006	-133	-2.2%
UW-Stevens Point	9,107	8,225	-882	-9.7%
<i>Stevens Point Campus</i>	7,760	7,229	-531	-6.8%
<i>Marshfield Campus</i>	545	421	-124	-22.8%
<i>Wausau Campus</i>	802	575	-227	-28.3%
UW-Stout	8,748	8,347	-401	-4.6%
UW-Superior	2,601	2,603	2	0.1%
UW-Whitewater	13,059	12,368	-691	-5.3%
<i>Whitewater Campus</i>	12,084	11,503	-581	-4.8%
<i>Rock County Campus</i>	975	865	-110	-11.3%
System Total	171,636	167,186	-4,450	-2.6%

NEW COURSE

CIV ENG 203 INTRODUCTION TO SOLID MECHANICS, U, 4 cr.
This course allows undergraduate special students.
Prereq: Math 232 (P).

COURSE CHANGE (changes indicated in red)

COMPSCI 337 SYSTEM PROGRAMMING, 3 cr.
Introduction to the application programmer interface for a modern
operating system. Overview of mechanisms for object oriented
programming and memory management
Prereq: C or better in CompSci 251(P) or CompSci 241(P)

**Materials and Structures Certificate Program - MSCP
in the Department of Civil and Environmental Engineering UW-Milwaukee**

The 15-credit Materials and Structures Certificate Program (MSCP) augments post-BS and graduate-level education related to the response of new materials in the design of modern structures. The program supports a diverse set of educational modules with emphasis on advances in construction materials combined with theoretical and computational methods in structural design.

The MSCP is aimed at students who wish to develop their preparation and skills in the field of materials and structures. The program was designed to address the current gap in engineering preparation in the areas of interaction of materials and structures, including the application of emerging materials such as high-performance composites, nano- and meta-materials, hierarchical, smart-, and 3D-printed materials. The proposed MSCP provides graduates with the capabilities to develop and improve structural designs and applications by using advanced materials, analysis, and modeling techniques.

Finally, the MSCP equips the students with the necessary skills to take up leading roles in analysis, design, research, and development of structures used in a variety of applications (from roadways to space). The MSCP classes are taught by instructors with international recognition in research and technology transfer.

EDUCATIONAL OBJECTIVES

The objective of this certificate program is to link current theories of the behavior of materials with innovative solutions in structural engineering. The proposed syllabus places special emphasis on materials optimization, computational techniques, advanced structural design, and experimental techniques. The MSCP aims to incorporate the concepts for innovative structures and increased service life while providing lower life-cycle and construction costs and improving structural performance.

The MSCP provides a unique interdisciplinary overview of research findings and code provisions on the performance of construction materials including the fundamental properties, materials characterization and processing techniques, modeling, standardization and test methods, and guidelines for the application of cutting-edge research results into the design of buildings and civil engineering infrastructure.

The construction materials module of MSCP is designed to develop a fundamental understanding of material behavior at multiple scales, aimed at achieving superior performance in civil engineering applications and predicting the service life and, ultimately, failure of materials and structures. The emphasis of this module is in developing experimental, diagnostic, and characterization method to formulate the constitutive multi-scale models connecting the microstructure and mechanical response of materials. The structural design module aims to optimize advanced structures with new types of materials, increasing the efficiency of load-carrying capabilities and improving resilience and resistance to failure. The structural module is also focused on understanding the scientific phenomena associated with extreme loading events on materials from earthquakes, high-velocity impacts, and fatigue loading from long-term environmental exposures. Additional interest areas include the mechanics of earthquake mitigation, as well as wind-structure interaction, and application of meta-materials, foams and other energy-absorbing materials, novel coatings, and smart materials.

FACULTY ACTIVE IN THIS AREA

Faculty members are engaged in research of advanced cement-based materials, composite materials, nanocomposites, computational mechanics, structural design and nondestructive evaluation.

CEE core faculty:

- Konstantin Sobolev
- Al Ghorbanpoor
- Habib Tabatabai
- Jian Zhao
- Rani F El Hajjar

Affiliated CEE faculty:

- Adeeb Rahman
- Sam Helwany
- Hani Titi

Affiliated CEAS faculty:

- Wilkistar Otieno
- Benjamin C Church
- Nidal H Abu-Zahra
- Nathan P Salowitz
- Ilya V Avdeev

Research in these topics at the University of Wisconsin - Milwaukee (UWM) focuses on a core understanding of the design and behavior of materials, and how these materials can affect the design of new and innovative structures.

ACTIVE RESEARCH TOPICS

- Advanced concrete with enhanced characteristics
- High-performance of cement-based materials
- Nanoengineered composites
- Microstructure characterization of construction materials
- Application of computational mechanics tools
- Smart materials and structural health monitoring

UWM offers excellent opportunities for study and research leading to advanced degrees in the areas of structural analysis and design, mechanics of structures, and construction materials. Active involvement of CEE faculty at the forefront of research projects and in the solution of challenging real-world engineering problems results in an instructional program that is up-to-date and relevant.

CURRICULUM

The MSCP curriculum provides a strong basis for advanced professional preparation and graduate education. Programs of study can be tailored to fit the individual needs and interests, whether broad-based and multidisciplinary or narrowly focused and highly technical. It is

expected that the graduates from the MSCP will become leaders in private practice, government service, education, and research.

To meet the MSCP requirements student may choose from a variety of graduate and undergraduate courses offered within the CEE Program and other units at UWM. By working with an adviser, the student can customize the program of study satisfying the needs of profession. Some areas of emphasis include the following:

- The behavior of structural materials
- Advanced concrete technology and cementitious materials
- Mechanics of composite materials
- Design and behavior of structures comprising reinforced and prestressed concrete, structural steel, and composites
- Earthquake engineering, analysis, and design
- Experimental analysis and non-destructive evaluation of structures
- Structural reliability and risk analysis

Outside CEE student may take courses in:

- Material Science and Engineering
- Mechanical Engineering
- Bioengineering
- Industrial Engineering

GRADUATE REQUIREMENTS

Prerequisites

Each MSCP application is considered on its individual merits, and so there are no formal prerequisites. The applicants are expected to complete an undergraduate or advanced degree in Civil Engineering or related field.

Program module

The full-time MSCP is designed to be a 1-year full-time equivalent program, including summer school. The MSCP consists of 5 unique units (no credit transfer from BS) for a total of 15 credits with at least 3 units from the approved blend of CEE graduate courses and the remaining up to 2 units from approved graduate or advanced undergraduate courses at CEAS. Up to 1 unit of the 2 units from CEAS may be taken in the form of Independent Study (CIV ENG 699 class) or Field Project Experience (TBD). To graduate from MSCP, student must maintain a minimum 3.0 grade point average.

Basic Module

- CE431 Materials of Construction
- CE463 Introduction to Finite Elements
- CE466 Mechanics of Composite Materials
- CE555 Sustainable Construction Materials and Technologies
- CE560 Intermediate Structural Analysis
- CE557 Durability of Concrete
- CE571 Design of Concrete Structures
- CE572 Design of Steel Structures
- CE573 Design of Masonry Structures
- CE574 Design of Prestressed Concrete Structures
- CE579 Earthquake Engineering
- Applied Mechanics of Materials and Structures

- Advanced Structural Mechanics
- Computational Mechanics
- CE731 Properties of Concrete

Supporting CEE and other departments courses:

- Design of Wood Structures
 - CE502 Experimental Stress Analysis
 - CE580 Engineering Analysis in Applied Mechanics
 - CE598 Pavement Analysis and Design
 - CE699 Independent Study
 - CE701 Advanced Strength of Materials
 - CE702 Elastic Stability
 - CE725 Finite Element Methods in Engineering
 - CE726/ME726 Mechanical Vibrations
 - CE732 Fatigue in Engineering Materials
 - CE735 Advanced Soil Mechanics
 - CE756 Advanced Foundation Engineering
 - CE761 Advanced Structural Analysis
 - CE771 Advanced Concrete Design
 - CE772 Advanced Steel Design
 - CE773 Advanced Dynamics
 - CE774 Shock and Vibration Analysis
 - CE775 Analysis and Design of Bridges
 - CE777 Design of Multistory Buildings
 - CE785 Dynamics of Structures
- Rock Mechanics
 - CE801 Applied Elasticity
 - CE804 Theory of Plasticity
 - CE891 Advanced Topics
 - MATLENG410 Mechanical Behavior of Materials
 - MATLENG452 Ceramic Materials
 - MATLENG453 Polymeric Materials
 - MATLENG457 Engineering Composites
 - MATLENG460 Nanomaterials and Nanomanufacturing
- Fracture of Engineering Materials
- Crystallography and Crystal Defects
- Microstructural Investigation of Materials
- MATLENG511 Advanced Materials Characterization
- Corrosion and Corrosion Protection
 - IND571 Quality Control
 - IND575 Design of Experiment
 - IND583 Facility Layout and Materials Handling
 - ME543 Introduction to Technology Management and Innovation
 - ME544 New Product Development

CEAS Seminars

A program of CEAS seminars is offered each semester, featuring invited professional engineers or faculty researchers including visitors from other universities. All CEAS graduate students are expected to attend the seminar.

Graduation Committee

The major-field adviser recommends a Graduation Committee that is approved by the Graduate School. The Graduation Committee will consist of 3 members, and two of the 3 committee members need to be CEE faculty. The third member needs to be from outside CEE.

Admissions

To apply for the MSCP submit the online application: <https://graduateschool-apply.uwm.edu/>

COURSE DESCRIPTIONS

See UWM Graduate Catalogue for all CEE course descriptions: <https://catalog.uwm.edu/>

UWM GRADUATE SCHOOL POLICY

All UWM graduate degree programs must conform to minimum requirements established by Graduate School: <https://uwm.edu/graduateschool/admission/>

INFRASTRUCTURE AT CEAS

Structures Laboratory

- strong floor capable of testing structures ranging from full-scale prototypes to small scale models
- several computer-controlled electro-hydraulic actuators for imposing loads
- multiple computer-based data acquisition systems
- computers and control equipment to study seismic response
- machine shop facilities
- 4 universal testing machines
- servo-controlled universal testing machines
- compression testing machines
- axial load torsion machine
- Charpy impact testing device

Structural Materials Laboratory

The Structural Materials Laboratory provides well-equipped facilities for class instruction, research, and service to industry associated with the performance of civil engineering materials such as concrete, cement and aggregates, structural steel, wood, and plastics.

The concrete laboratory provides facilities for:

- aggregate testing and preparation
- concrete mixing, fabrication, curing, and preparation of test specimens

- testing of fresh and hardened concrete

For studying the microstructure of concrete, the state-of-the-art equipment is available at CEAS Advanced Analytical Facility:

- scanning electron microscopes
- x-ray diffraction
- nano-indentation

For studying the response of materials under a wide range of environmental conditions, the laboratory with temperature-humidity controlled rooms are available. These include:

- large fog room for standard curing
- walk-in environmental chamber with various temperature controls (-20°C to +20°C)
- ovens (up to 260°C and 1100°C)

Institutes and Libraries

In addition to the CEE Department and CEAS research facilities, the EMS and USR house the laboratories operated by the CBU and Transportation Center.

Institute for Physical Infrastructure and Transportation, IPIT, is a new research unit of the College of Engineering.

Libraries

- UWM Golda Meir Library
- CEAS Engineering Library
- CEAS Computer Labs with dedicated on-site support
- CEE virtual reality lab

In addition to CEAS lab facilities, the CEE department maintains instructional computer labs with workstations providing engineering software for student use. Students enrolled in CEE classes may use these labs.

Contact

Program Leader: Konstantin Sobolev, sobolev@uwm.edu

Academic Affairs Office, for all admissions, financial aid, course enrollment, and advising questions:

<https://uwm.edu/academicaffairs/>

For general information: <https://uwm.edu/contact/>