

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

FACULTY MEETING

Friday, February 24, 2017 1:30 P.M. EMS E180

AGENDA

I. ANNOUNCEMENTS

II. INTRODUCTIONS

A. Brooke Slavens, Associate Professor, Biomedical Engineering

III. INFORMAL REPORTS – See Attachment 1

A. Opportunity for questions regarding Informal Reports

IV. AUTOMATIC CONSENT BUSINESS

A. New Courses and Course Modifications – See Attachment 2

B. Minutes of the January 27, 2017 Meeting

V. NEW BUSINESS

A. M.S. Concentration in Occupational Biomechanics / Ergonomics – See Attachment 3

B. M.S. Concentration in Industrial and Systems Engineering – See Attachment 4

C. M.S. Concentration in Manufacturing Engineering – See Attachment 5

D. M.S. Concentration in Energy Engineering – See Attachment 6

E. Expectations of CEAS Chairpersons – See Attachment 7

VI. GENERAL GOOD AND WELFARE

VII. ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

INFORMAL REPORTS

Office of Student Services – Todd Johnson

No Report

Career Services – Juli Pickering

No Report

Curriculum Committee – Prof. Church

No Report

Graduate Program Subcommittee – Prof. Lopez

No Report

Academic Planning Committee – Prof. Misra

APC met twice since last informal report and the following is a summary of the actions.

- 1) APC recommended approval of the authorization to implement B.S. program in Applied Computing submitted by the Computer Science Program.
- 2) Assistant Dean Klajbor made a power-point presentation on the current status of the CEAS budget. Dean Peters presented a draft-plan that will be used in allocating next year's budget to each department.
- 3) Potential curricular activities for high-achieving engineering students were discussed with a tentative title as the Engineering Scholar program.
- 4) Committee reviewed the IME Department's proposal for a new concentration in Occupational Biomechanics/ Ergonomics within the MS in Engineering program. Members asked to insert a statement to clarify that it will be implemented with existing resources of the Department and will not require new resources. The modified proposal was approved.
- 5) APC continues discussions on the program assessment strategies and related issues.

Biomedical and Health Informatics – Prof. McRoy

No Report

Graduate Faculty Committee – Prof. Hosseini

- 1) GFC will consider the following topics in next meeting scheduled for Feb. 20, 2017.
 - Proposed Permanent Incomplete Policy
 - Curricular Area Codes: Applied Computing (APC)
- 2) Research Policy and Advisory Committee
This committee has started the discussion of the impact of scholarly work on Faculty Workload.

Faculty Senate – Prof. Reisel

The Faculty Senate met on January 26 and February 16. While there were items of business on the agenda, there were no items of business of particular immediate importance to CEAS.

All faculty and staff are invited to a Coffee with a Cop event from 9-11 am on February 28 at the Union Grind. Coffee is free!

NEW COURSES

- COMPSCI 547 USER-CENTERED INTERACTION DESIGN, 3 cr., U/G
Introduction of human-computer interaction theories and design processes. Emphasis is on applied user experience (UX) design.
Prereq: sr st.
- COMPST 750 PROBLEM SOLVING WITH OBJECT-ORIENTED PROGRAMMING, 3 cr., G
Problem solving with object-oriented programming language. Topics include arrays, strings, classes, standard data structures, graphical user interfaces, exceptions, files, debugging, and configuration management.
Prereq: Previous programming experience such as COMPST 702, COMPSCI 240, or COMPSCI 250.
- COMPST 751 DATA STRUCTURES AND ALGORITHMS, 3 cr., G
Programming in a structured, high-level, object-oriented language. Implementation of data structures and algorithms and their application
Prereq: CompST 750 or CompSci 251 (recommended)

COURSE CHANGES

- ELECENG 457 DIGITAL LOGIC LABORATORY, 3 cr. U/G
Digital design using a hardware description language and FPGAs. Topics include VHDL, Design Methodologies, Finite State Machines, Multiple clock domains, Timing Analysis, Simulation and Verification. Prereq: jr st, ElecEng 354(P).

had been

- ELECENG 457 DIGITAL LOGIC LABORATORY, 3 cr. U/G
Experimentation with digital logic systems. Synthesis of digital systems, such as adders, shift registers. Analog/digital and digital/analog converters from basic logic modules.
Prereq: jr st, ElecEng 354(P).

INDUSTRIAL AND MANUFACTURING ENGINEERING

OCCUPATIONAL BIOMECHANICS / ERGONOMICS

MS CONCENTRATION

This concentration replaces an existing “Ergonomics, Musculoskeletal Biomechanics & Rehabilitation” track and requires no new additional resources.

The Occupational Biomechanics/Ergonomics concentration provides the fundamental principles of musculoskeletal biomechanics and ergonomic design principles applied to injury prevention and rehabilitation. The curriculum offers a solid foundation in a wide variety of areas ranging from theoretical principles, laboratory testing for industrial and clinical applications as well as practical implementation. The program offers necessary knowledge to effectively design equipment, tasks, work environments and systems to maximize performance, comfort, job satisfaction and productivity while minimizing the risk of injury.

A unique aspect of the Occupational Biomechanics/Ergonomics concentration is that courses are not limited to engineering. Students may take courses in biostatistics, epidemiology, occupational therapy, public health policy administration and kinesiology — giving graduates an expanded view of the newest research in the areas of injury prevention and rehabilitation. You must meet **Graduate School Requirements** to enroll in this concentration.

Graduates of this concentration have the opportunity to work for manufacturing organizations, insurance companies, conduct government research and health care organizations.

Course Requirements:

- Students must complete at least 6 credits from **Group A**.
- Thesis option students must complete at least 18 credits combined from **Group A** and **Group B**.
- Non-thesis option students must complete at least 24 credits combined from **Group A** and **Group B**.
- Students must complete at least 2, but no more than 3 credits of IndEng 880.
- Any remaining credits in the MS in Engineering program of study may be taken as free electives.

GROUP A

IND ENG 580: Introduction to Ergonomics	3 cr U/G
IND ENG 890: Research Methods in Engineering	3 cr U/G
OCCTHPY 625: Design & Disability	3 cr U/G

GROUP B

IND ENG 880: Bioengineering Seminar	1 cr U/G
IND ENG 575: Design of Experiments	3 cr U/G
IND ENG 582: Ergonomic Job Analysis Techniques	3 cr U/G
KIN 520: Advanced Biomechanics - Neuromechanics	3 cr U/G
IND ENG 780: Advanced Ergonomics	3 cr G
IND ENG 783: Advanced Ergonomics in Upper Extremity	3 cr G
IND ENG 716: Engineering Statistical Analysis	3 cr G
IND ENG 890: Advanced Topics in Ind Eng: Human Factors Engineering	3 cr U/G
IND ENG 890: Advanced Topics in Ind Eng: Instrument in Ergonomics & Biomech	3 cr U/G
IND ENG 890: Advanced Topics in Ind Eng: Connected Enterprise	3 cr U/G
MATLENG 710: Advanced Mechanical Behavior of Materials	3 cr G
PH 711: Intermediate Biostatistics	3 cr G
PH 759: Applied Quantitative Methods for Studying Population Health Disparities	3 cr G
PH 777: Survey of Quantitative Research and Methods	3 cr G
KIN 720: Applied Research Methods in Biomechanics	3 cr G
KIN 725: Interdisciplinary Themes in Biomechanics	3 cr G

Ergonomics, Musculoskeletal Biomechanics & Rehabilitation Track

Prerequisite:

At least a 3 credit course in anatomy of musculoskeletal system (Student may take BIO SCI 202 or a similar 3-credit course) or consent of program director for above track.

Thesis option (at least 24 credits)

1) 3 thesis credits

2) Minimum 21 course credits

- 3 credits of free electives- Students may take up to 3 credits of graduate level courses in any discipline to serve their educational needs

Non-thesis option (total 30 credits)

1) 30 course credits

- 6 credits of Free Electives - Students may take up to 6 credits of graduate level courses in any discipline to serve their educational needs

Available courses

	Course number	Course title	Level
Group A	Ind Eng 580	Introduction to Ergonomics, 3 cr	U/G
	Ind Eng 584	Research Methods in Biodynamics of Human Motion (3 credits)	U/G
	OccThpy 625	Design & Disability, 3 cr	U/G
Group B	New Course Ind Eng 880	Bioengineering Seminar, 1 cr (enroll for two semesters)	G
	Ind Eng 582	Ergonomic Job Analysis Techniques (CAR in progress), 3 cr	U/G
	Ind Eng 780	Advanced Ergonomics - Low Back Pain, 3 cr	G
	Ind Eng 783	Advanced Ergonomics in Upper Extremity, 3 cr	G
	Ind Eng 786	Applied Biostatistics in Ergonomics, 3 cr	G
	New Course Ind Eng 880 or OccThpy 741	Bioengineering Seminar, 1cr or Research Seminar, 1 cr	G
	New course Ind Eng XXX	Research Methods, 3 cr	G
	New course Ind Eng XXX	Advanced Instrumentation in Ergonomics/Biomechanics, 3 cr	G
	HMS 520	Advanced Biomechanics, 3 cr	U/G
	HMS 521	Pathoetiology of Musculoskeletal Injury, 3 cr	U/G
	HMS 522	Qualitative Analysis of Human Movement, 3 cr	U/G
	HMS 725	Interdisciplinary Themes in Biomechanics, 3 cr	G
	OccThpy 593	Introduction to Biomedical and Rehabilitation Instrumentation, 3 cr	U/G
	OccThpy 701	Advanced Measurement and Instrumentation in Health Care, 3 cr	G
	Free Electives (3-6)		

- Students need to have at least two, but no more than three credits of Ind Eng 880
- Students cannot select both OCCTHPY 741 Research Seminar and the third credit of Ind Eng 880 as technical electives
- Students must take at least 6 credits from Group A.
- Thesis option students must take at least 18 credits combined from Group A and Group B. Non-thesis option students must take at least 24 credits combined from Group A and Group B.

MODIFIED VERSION_11_30_2016**Formal name of concentration**

Industrial and Systems Engineering

Degree Program

Master of Science in Engineering

General Requirements

A minimum of 15 credits of qualifying graduate courses in Industrial and Manufacturing Engineering; may include up to 3 credits each of Ind Eng 990 ~~and Ind Eng 999~~

Qualifying Courses

~~Ind Eng 575, 582, 583, 716, 717, 765, 768, 880, 777, 890, 990, 999~~ Qualifying courses for the concentration are shown in the following table:

Course Offering Summary

Course No.	Title	Last offered (with enrollment)	Previously offered
575	Design of Experiments	Spring 2017	Spring 2016
580	Ergonomics	Spring 2016	Spring 2014
583	Facility Layout and Material Handling	Fall 2016	Fall 2015
716	Engineering Statistical Analysis	Win 2017 <u>Spring 2016</u>	Spring 2016 <u>???</u>
717	Operations Research for Engineering Management	Fall 2016	Fall 2015
765	Operations Research Methods		
768	Applied Stochastic Processes	Fall 1993	Spring 1992
880	CEAS Grad Seminar	Spring 2017	Fall 2016
777	Scheduling	Win 2017 <u>Spring 2016</u>	??? <u>Spring 2016</u>
890	Adv Topics Ind Eng: Global Logistics Management	Spring 2016	Fall 2014
890	Adv Topics Ind Eng: Connected Enterprise	Fall 2016	
890	Adv Topics Ind Eng: Time Series Analysis & Forecasting		
890	Adv Topics Ind Eng: Advanced Mathematical Programming	Fall 2016	Spring 2015
890	Adv Topics Ind Eng: Advanced Discrete Event Simulation	Fall 2014	Fall 2012
890	Adv Topics Ind Eng: Operations Research Modeling	Spring 2013	
990	Master's Thesis	Fall 2016	Summer 2016
999	Advanced Independent Study	Fall 2016	Spring 2016

Compelling reasons for transcript designation

Due to diverse technical areas in engineering and common practice by most engineering institutions in the US, it is important that an area of concentration be listed in a student's academic records. This will describe the student's background better and will enhance employment opportunities for the student. It will also aid the department in tracking graduate students.

OLD VERSION**Formal name of concentration**

Industrial and Management Engineering, (effective spring 2004 -originally part of Industrial and Manufacturing concentration)

Degree Program

Master of Science in Engineering

General Requirements

A minimum of 15 credits of graduate courses in Industrial and Manufacturing Engineering; may include up to 3 credits of Ind Eng 990 or 999

Qualifying Courses

Ind Eng 701, 702, 705, 765, 767, 768, 770, 772, 780, 783, 786, 787, 788, 790, 890, 990, 999

Course Offering Summary

Course No.	Title	Last offered (with enrollment)	Previously offered
701	Operational Methods in Systems Analysis	Summer 1985	Summer 1984
702	Engineering Systems Economy	Spring 1995	Fall 1993
705	Engineering Simulation Project	Spring 2003	Spring 1998
765	Operations Research Methods	Fall 1994	Fall 1992
767	Statistical Mthd-Engrs/Scientst	Fall 2002	Fall 1995
768	Applied Stochastic Processes	Fall 1993	Spring 1992
770	Advanced Quality Control	Spring 2004	Fall 2003
772	Facilities Planning	Unknown	
780	Adv Ergonomics Low Back	Spring 2004	Spring 2003
783	Adv Ergonomics Upper Extremities	Fall 2003*	Fall 2002
786	Appld Biostatistics-Ergonomics	Fall 2003*	Fall 2002
787	Issues-Ergonomics Epidemiology	Spring 2000	Spring 1998
788	Ergonomics: Legal/Regulatory	Spring 2000	Spring 1998
790	Design Project	Fall 2003*	Spring 2002
890	Adv Topics Indus/Systems Engr	Spring 2004	Spring 2002
990	Master's Thesis	Spring 2004*	Fall 2003
999	Advanced Independent Study	Spring 2004*	Spring 2003

* Scheduled for Summer or Fall 2004

Compelling reasons for transcript designation

Due to diverse technical areas in engineering and common practice by most engineering institutions in the US, it is important that an area of concentration be listed in a student's academic records. This will describe the student's background better and will enhance employment opportunities for the student. It will also aid the department in tracking graduate students.

Compliance with GFC Doc. 878

Two of the course choices, Ind Eng 705 and 770, are co-listed with the proposed concentration in Manufacturing Engineering. The GFC finds this acceptable. Students who wish to receive multiple concentrations within the MS in Engineering must complete 15 credits from the approved list of courses for each concentration.

MODIFIED VERSION_11_30_2016**Formal name of concentration**

Manufacturing Engineering

Degree Program

Master of Science in Engineering

General Requirements

A minimum of 15 credits of **qualifying** graduate courses in Industrial and Manufacturing Engineering; may include up to 3 credits **each** of Ind Eng 990 **and Ind Eng** 999

Qualifying Courses

Qualifying courses for the concentration are shown in the following table:
IND-ENG 550, 571, 575, 582, 583, 587, 716, 740, 751, 880, 890, 990, 999

Course Offering Summary (as of Spring 2017)

Course No.	Title	Last offered (with enrollment)	Previously offered
550	Control of Automated Manufact. Systems	Spring 2017	Fall 1999
571	Advanced Quality Control	Fall 2016	Fall 2015
575	Design of Experiments	Spring 2017	Spring 2016
582	Ergonomic Job Evaluation Techniques	Spring 2016	Spring 2014
583	Facility Layout and Material Handling	Fall 2016	Fall 2015
587	Lean Production Systems	Spring 2017	Spring 2015
716	Engineering Statistical Analysis	Winter 2017	Spring 2016
740	Intelligent Manufacturing Systems	Spring 2003	Spring 2002
751	Flexible Manufacturing Systems	Fall 2015	Fall 2016
880	CEAS Grad Seminar	Spring 2017	Fall 2016
890	Adv Topics Ind Eng: Sustainable Energy Systems & Industrial Management	Fall 2015	Fall 2013
890	Adv Topics Ind Eng: Connected Enterprise	Fall 2016	
990	Master's Thesis	Fall 2016	Summer 2016
999	Advanced Independent Study	Fall 2016	Spring 2016

Compelling reasons for transcript designation

Due to diverse technical areas in engineering and common practice by most engineering institutions in the US, it is important that an area of concentration be listed in a student's academic records. This will describe the student's background better and will enhance employment opportunities for the student. It will also aid the department in tracking graduate students.

OLD VERSION

Formal name of concentration

Manufacturing Engineering (effective spring 2004 - originally part of the Industrial and Manufacturing Engineering concentration)

Degree Program

Master of Science in Engineering

General Requirements

A minimum of 15 credits of graduate courses in Industrial and Manufacturing Engineering; may include up to 3 credits of Ind Eng 990 or 999

Qualifying Courses

Ind Eng 705, 740, 750, 751, 770, 990, 999

Course Offering Summary (as of spring 2004)

Course No.	Title	Last offered (with enrollment)	Previously offered
705	Engineering Simulation Project	Winterim 2004	Spring 2003
740	Intelligent Manufacturing Systems	Spring 2003	Spring 2002
750	Group Technolgy/Prcess Planning	Spring 2003	Spring 2001
751	Flexible Manufacturing Systems	Fall 2003*	Spring 2002
770	Advanced Quality Control	Spring 2004	Fall 2003
990	Master's Thesis	Spring 2004*	Fall 2003
999	Advanced Independent Study	Spring 2004*	Spring 2003

* Scheduled for Summer or Fall 2004

Compelling reasons for transcript designation

Due to diverse technical areas in engineering and common practice by most engineering institutions in the US, it is important that an area of concentration be listed in a student's academic records. This will describe the student's background better and will enhance employment opportunities for the student. It will also aid the department in tracking graduate students.

Compliance with GFC Doc. 878

Two of the course choices, Ind Eng 705 and 770, are co-listed with the proposed concentration in Industrial and Management Engineering. The GFC finds this acceptable. Students who wish to receive multiple concentrations within the MS in Engineering must complete 15 credits from the approved list of courses for each concentration.

ATTACHMENT 6**Formal name of concentration**

Energy Engineering (effective fall 2009)

Degree Program

Master of Science in Engineering

General Requirements

A minimum of 15 credits of graduate courses from the list below.

Course title and number	Last offered with enrollment	Previously offered
Aerodynamics of Wind Turbines (ME425)	Fall 2011	New course
Internal Combustion Engines (ME432)	Fall 2016	Fall 2015
Air Conditioning System Design (ME434)	Fall 2014	Spring 2007
Power Plant Theory and Design (ME435)	Spring 2017	Fall 2015
Solar Engineering (ME436)	Spring 2016	Fall 2014
Electric Power Systems (EE471)	Fall 2015	Fall 2014
Introduction to Wind Energy (EE/ME472)	Fall 2016	Fall 2015
Power Electronics (EE572)	Fall 2016	Fall 2015
Intermediate Control Systems (EE/ME574)	Spring 2016	Spring 2015
Analysis of Electric Machines And Motor Drives (EE575)	Spring 2016	Spring 2015
Advanced Linear System Analysis (EE/ME701)	Fall 2015	Fall 2014
Advanced Engineering Thermodynamics (ME702)	Spring 2017	Spring 2014
Advanced Transport Processes (ME710)	Fall 2016	Fall 2014
Thermal Radiation and Conduction (ME711)	Fall 2014	Fall 2007
Convection Heat and Mass Transfer (ME712)	Fall 2016	Spring 2015
Nonlinear Control Systems (EE/ME718)	Fall 2016	Fall 2001
Fundamentals of Fluid Flow (ME 721)	Spring 2016	Fall 2014
Advanced Fluid Mechanics (ME 722)	Fall 2016	Spring 2015
Computational Fluid Dynamics and Heat Transfer (ME723)	Spring 2017	Fall 2015
Fluid Power and Turbomachinery (ME725)	Spring 2016	Fall 2013

Course title and number	Last offered with enrollment	Previously offered
Adaptive Control Theory (EE/ME819)	Spring 2014	Spring 2009

Compliance with GFC Doc. No. 878

These courses are subsets of those for the concentrations in Electrical and Computer Engineering, and Mechanical Engineering. Students who wish to receive multiple concentrations within the MS in Engineering must complete 15 credits from the approved list of courses for each concentration. Additionally, students cannot earn the energy concentration and the certificate in energy. Students who wish to earn the certificate in energy and another Engineering MS concentration can only count 6 certificate credits toward the degree.

UNIVERSITY OF WISCONSIN-MILWAUKEE COLLEGE OF ENGINEERING & APPLIED SCIENCE EXPECTATIONS OF CHAIRPERSONS

FOR EFFECTIVE LEADERSHIP OF DEPARTMENTS

The following supplements but does not replace the duties of the department chair as specified in section 4.07 of the Faculty Policies and Procedures (FP&P). Following the FD 2381, this document elaborates on FP&P 4.07 (9), which specifies that the Department Chair "acts as the executive of the department" and provides definition to the expectations for an "executive of the department". Further, the department chair is reminded to be aware of the responsibilities of the executive committee as defined in section 4.05 of the UWM FP&P.

A chairperson in the CEAS is expected to provide leadership for the department. These include the following over-arching leadership responsibilities:

1. Working with the faculty and staff to develop, implement, and achieve a vision that inspires and unites them to work together collegially to achieve the mission of the department, college and university.
2. Leading the development and execution of a well-defined and articulated strategic plan that the faculty, staff, students, alumni and external advisory board supports. The plan must be in alignment with the initiatives and strategic plan of the college and the university.
3. Providing leadership to improve the level of excellence and prominence of the department.
4. Fostering and ensuring a departmental climate that is supportive and collegial, including taking steps to ensure that no one in the department is subjected to bullying or harassment.
5. Leading the development efforts and the implementation of an advancement model to enhance alumni relations and engage in philanthropic activities that will benefit the department, college, and university and that aligns with those of the college and the university.

The specific duties of the chair may differ from department to department based on personal style and departmental policy. In general, however, leadership encompasses the key responsibilities and accountabilities outlined below. Although the chair is responsible for ensuring that these expectations are met, many but not all of these activities can be delegated within the department. This "expectations" document should be used as a guideline by a chairperson and the departmental executive committees in establishing the delegation of duties and administrative structure of a department.

I. THE CHAIR IS EXPECTED TO BE THE CHAMPION OF FACULTY CAUSES

Example activities include, but not limited to:

- a. Assuming the primary responsibilities for retaining an excellent and diverse faculty;
- b. Ensuring appropriate mentoring and professional development programs exist for faculty, including assisting faculty to develop effective teaching, research and service efforts;
- c. Providing systems for continuous development and implementation of the strategic plan;
- d. Providing faculty with meaningful feedback on their performance annually, which could include explaining to faculty the basis for annual salary raises and promotions;

- e. Maintaining equity in faculty workloads, including teaching assignments;
- f. Establishing an active program for nominating faculty for awards both internally and externally;
- g. Bringing faculty concerns to the attention of the Dean and the APC.

II. THE CHAIR IS EXPECTED TO BE THE CHAMPION OF STUDENT INTERESTS

Example activities include, but not limited to:

- a. Striving for continuous improvement in the quality of instruction;
- b. Soliciting student feedback regarding teaching performance, course offerings and program quality;
- c. Responding to student concerns regarding department courses and program;
- d. Encouraging and supporting student participation in student organizations, national competitions, and leadership development opportunities;
- e. Ensuring effective student advising within the department;
- f. Nominating students for internal and external awards;
- g. Recruiting and retaining a diverse student population.

III. THE CHAIR IS EXPECTED TO BE STEWARD OF DEPARTMENTAL RESOURCES

Example activities include, but not limited to:

- a. Managing department financial resources in a manner that provides opportunity while remaining within budget;
- b. Using UWM Foundation funds to benefit the department, and stewarding the donors who provided the funds;
- c. Striving for continuous improvement in quality in all departmental operations in a manner consistent with available resources;
- d. Providing oversight of faculty research expenditures;
- e. Managing facilities including assignment of space allocated to the department by the College as well as the periodic review and assessment of space utilization.

V. ACCOUNTABILITY AND PERFORMANCE

The department chair will provide a concise annual report to the Dean of the College that includes:

- a. The state of the department, including an assessment of the performance of the department in achieving its goals and deliverables as articulated in the department's strategic plan;
- b. A concise statement of the department's goal and deliverables to be achieved in the next academic year. This should include such items as a hiring plan for faculty, lecturers, and staff; instruction and research infrastructure needs, financial resources needed, etc.;
- c. Progress on and changes to the departmental strategic plan, and initiatives of the department, and how they align with the initiatives and strategic plan of the college and university;
- d. A self-assessment of the activities of the department chair during the current academic year and a concise statement of goals for the coming academic year.

The annual report must be received in the College no later than the last Monday in May of each year.

This document may be revised on an annual basis at the discretion of the APC or the Dean of the CEAS.