**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, April 26, 2019  10:30 A.M.  EMS E180**

# A G E N D A

## I. DEAN UPDATE

## II. ANNOUNCEMENTS

A. 2019-20 CEAS Committee Representatives – See Attachment 1

B. Accessibility Resource Center – Ethan Munson

C. Corporate Relations Update – Mike Andrew

D. Gender Bias Informal Survey Results – Brian Armstrong

## III. INFORMAL REPORTS – See Attachment 2

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 February 1, 2019 meeting

B. New Courses and Course Changes – See Attachment 3

C. Revision to Electrical Engineering B.S. Program. – See Attachment 4

D. Revision to the Industrial Engineering B.S. Program – See Attachment 5

E. 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. SPECIAL ORDER OF BUSINESS – Nominations

A. Awards and Recognition Committee

Faculty: Only members of Biomedical Engineering, Electrical Engineering and Computer Science, and Materials Engineering may be nominated. One member is to be elected.

Nominations Already Received:

Professor Pradeep Rohatgi – Materials Engineering
Professor Ichiro Suzuki – Electrical Engineering and Computer Science

Continuing Members:

Professor Konstantin Sobolev – Civil and Environmental Engineering
Professor Kevin Renken – Mechanical Engineering

Academic Staff: Nominations are open for the Academic Staff member of the committee.

## VII. NEW BUSINESS

A. GPSC Charter – See Attachment 6

## VIII. GENERAL DISCUSSION

## IX. ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

**ATTACHMENT 1**

# *CEAS COMMITTEES FOR 2019-20*

1) **CURRICULUM COMMITTEE**

| | |
|---|---|
| Professor Ben Church – Materials Science and Engineering | 2021 |
| Professor Rohit Kate – Computer Science | 2021 |
| Professor – Industrial Engineering | 2021 |
| Professor – Biomedical Engineering | 2021 |
| Professor Roshan D'Souza – Mechanical Engineering | 2020 |
| Professor Adeeb Rahman– Civil and Environmental Engineering | 2020 |
| Professor Robert Cuzner – Electrical Engineering | 2020 |

2) **GRADUATE PROGRAM SUBCOMMITTEE**

| | |
|---|---|
| Professor Jenny Zheng – Biomedical Engineering | 2021 |
| Professor – Civil and Environmental Engineering | 2021 |
| Professor – Electrical Engineering | 2021 |
| Professor – Industrial Engineering | 2021 |
| Professor Ichiro Suzuki – Computer Science | 2020 |
| Professor Ryo Amano – Mechanical Engineering | 2020 |
| Professor Hugo Lopez – Materials Science and Engineering | 2020 |
| Professor– GFC Representative | |
| Professor– GFC Representative | |

3) **ACADEMIC PLANNING COMMITTEE**

| | |
|---|---|
| Professor – Industrial Engineering | 2022 |
| Professor – Mechanical Engineering | 2022 |
| Professor Nidal Abu-Zahra – Materials Science & Engineering | 2021 |
| Professor Dev Misra – Electrical Engineering | 2021 |
| Professor Hossein Hosseini – Computer Science | 2020 |
| Professor Adeeb Rahman – Civil and Environmental Engineering | 2020 |

4) **SCHOLASTIC APPEALS COMMITTEE**

| | |
|---|---|
| Professor Susan McRoy – Computer Science | 2021 |
| Professor – Industrial Engineering | 2021 |
| Professor – Mechanical Engineering | 2021 |
| Professor Yi Hu – Electrical Engineering | 2020 |
| Professor Junjie Niu – Materials Science and Engineering | 2020 |
| Professor – Civil and Environmental Engineering | 2020 |

5) **AWARDS AND RECOGNITION COMMITTEE**

| | |
|---|---|
| Professor | 2021 |
| Academic Staff Representative | 2021 |
| Professor Kevin Renken – Mechanical Engineering | 2020 |
| Professor Konstantin Sobolev – Civil and Environmental Engineering | 2020 |

**ATTACHMENT 2**

## INFORMAL REPORTS

*Office of Student Services* – Todd Johnson
No Report

*Career Services* – Juli Pickering
No Report

*Curriculum Committee* – Prof. A. Rahman
No Report

*Graduate Program Subcommittee* – Prof. Liao
No Report

*Academic Planning Committee* – Prof. Patrick
No Report

*Faculty Senate* – Prof. Reisel

In its February meeting, the Faculty Senate approved a number of changes to P&P, and new academic policies. In the March meeting, the Senate approved the authorization to implement a B.S. in Environmental Engineering, as well as some graduate policy revisions. In the April meeting, the Senate again approved policy revisions. If you give Incomplete grades, you may want to review the new policy and how it treats extended incompletes.

**ATTACHMENT 3**

NEW COURSES

EAS 121 AUTOMATION CONTROLS AND SENSORS, 4 cr., U
Industrial automation principles; controller technology and programming; controller applications and troubleshooting; network infrastructure technology; basic instrumentation technology.
Prereq: None

EAS 122 MOTION CONTROL AND SAFETY, 3 cr., U
AC drive and motor technology; visualization and information software; machine safety technology; motion control technology.
Prereq: None

COURSE CHANGES (Changes Indicated in Red)

BME 495 BIOMEDICAL INSTRUMENTATION LABORATORY, 3 cr., U
Characteristics of measurement systems, experiment planning, sensor and system calibration, measurement of basic quantities, first and second order systems, data acquisition and processing, experimental projects. ~~BME 495 and MechEng 495 are jointly offered and count as repeats of one another.~~
Prereq: BME 305 (C), BME 310 (C), BME 325 (P), ~~MechEng 469 (C).~~

COMPSCI 481 SERVER-SIDE INTERNET PROGRAMMING, 3 cr., U/G
Introduces students to the concept of server-side programming and web applications development. Topics include dynamic web site development, session management, security, and relational databases.
Prereq: jr st; one of CompSci 113 (P), InfoSt 320 (P), or Art 324 (P); C or better in CompSci 202(P), CompSci 361(P) or CompSt 702(P)

ELECENG 101 FUNDAMENTALS OF ELECTRICAL ENGINEERING, 3 cr., U
Principles of electrical engineering including intro to fundamental electrical quantities and circuit analysis. Lab with reenforcing experiments, introduction to electrical test equipment, computer simulation techniques, and team project. Counts as repeat of ElecEng 299 with same topic. Not open to students who have completed ElecEng 301, must be replaced with an additional group A technical elective.
Prereq: Math 116 (C)

ELECENG 595 CAPSTONE DESIGN PROJECT, 5 cr., U
Team project in simulated industrial environment. Each team develops solutions to complex real world design problems and reports results in professional writing and oral presentation. Counts as a repeat of ElecEng 355.
Prereq: sr st; ElecEng 335(P), ElecEng 367(P).

# ELECTRICAL ENGINEERING, BSE

## In Workflow

1. CIM Registrar's Office (chinn@uwm.edu; ebilicki@uwm.edu; rothmann@uwm.edu; jenstein@uwm.edu)
2. CEAS Dean Programs (johnsont@uwm.edu; munson@uwm.edu)
3. Academic Affairs (candres@uwm.edu)
4. APCC Chair (candres@uwm.edu)
5. Provost's Office (candres@uwm.edu)
6. CAT Reminder (ebilicki@uwm.edu; chinn@uwm.edu)

## Approval Path

1. Mon, 15 Apr 2019 14:02:57 GMT
   Emily Kuhnen (ebilicki): Approved for CIM Registrar's Office

## History

1. Aug 18, 2018 by clmig-jwehrheim
2. Sep 18, 2018 by Emily Kuhnen (ebilicki)

Date Submitted:Fri, 12 Apr 2019 21:47:57 GMT

## Viewing:Electrical Engineering, BSE

## Last approved:Tue, 18 Sep 2018 21:25:24 GMT

## Last edit:Fri, 12 Apr 2019 21:47:52 GMT

Changes proposed by: bsra

**Reviewer Comments**

**Emily Kuhnen (ebilicki) (Mon, 15 Apr 2019 14:02:52 GMT):**ELECENG 595 is currently in workflow to be approved for the increase from 4 to 5 credits.

**Is this a proposal to create a new submajor or concentration?**

No

**Title of program:**

Electrical Engineering, BSE

**Program Level:**

Undergraduate Only

**Program Type:**

Major

**Department or Functional Equivalent**

| Units: |
| --- |
| Electrical Engineering |

**College, School, or Functional Equivalent**

| Units: |
| --- |
| College of Engineering and Applied Science |

**Proposed Effective Catalog:**

2019-2020

**Proposed Effective Term:**

Fall 2019

**Summary of proposed changes or request:**

EE 595 Senior Design, a required Undergraduate course, is very intensive and was increased from 4 to 5 credit hours. This was compensated by reducing the free electives from 3 to 2, keeping the total program at 126 credits.

**Program Curriculum (for the Catalog)**

# Electrical Engineering Curriculum

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in electrical engineering is 126. Engineering students may apply for major status with their academic advisor at any time they believe they meet the requirements. Admission to major is a graduation requirement. Programs may impose major status as a prerequisite for courses numbered 200 or above.

| Code | Title | Credits |
|---|---|---|
| **Engineering Core** | | |
| COMPSCI 240 | Introduction to Engineering Programming | 3 |
| COMPSCI 241 | C Programming for Embedded Systems | 3 |
| EAS 200 | Professional Seminar | 1 |
| ELECENG 101 | Fundamentals of Electrical Engineering | 3 |
| ELECENG 301 | Electrical Circuits I | 3 |
| MATLENG 201 | Engineering Materials | 4 |
| **Major Requirements** | | |
| ELECENG 305 | Electrical Circuits II | 4 |
| ELECENG 310 | Signals and Systems | 3 |
| ELECENG 330 | Electronics I | 4 |
| ELECENG 335 | Electronics II | 4 |
| ELECENG 354 | Digital Logic | 3 |
| ELECENG 361 | Electromagnetic Fields | 3 |
| ELECENG 362 | Electromechanical Energy Conversion | 4 |
| ELECENG 367 | Introduction to Microprocessors | 4 |
| ELECENG 420 | Random Signals and Systems | 3 |
| ELECENG 595 | Capstone Design Project | 5 |
| **Mathematics Requirement** | | |
| Select one of the following Calculus sequences:[1] | | 10-12 |
| Sequence 1: | | |
| MATH 231<br>& MATH 232<br>& MATH 233 | Calculus and Analytic Geometry I<br>and Calculus and Analytic Geometry II<br>and Calculus and Analytic Geometry III | |
| Sequence 2: | | |
| MATH 221<br>& MATH 222 | Honors Calculus I<br>and Honors Calculus II | |
| ELECENG 234 | Analytical Methods in Engineering | 4 |
| **Chemistry Requirement** | | |
| CHEM 105 | General Chemistry for Engineering | 5 |
| or CHEM 102 | General Chemistry | |
| **Physics Requirement** | | |
| Select one of the following options: | | 10 |
| Option 1: | | |
| PHYSICS 219<br>& PHYSICS 220 | Physics I: Calculus-Based, Studio Format<br>and Physics II: Calculus-Based, Studio Format | |
| Option 2: | | |
| PHYSICS 209<br>& PHYSICS 214 | Physics I (Calculus Treatment)<br>and Lab Physics I (Calculus Treatment) | |
| PHYSICS 210<br>& PHYSICS 215 | Physics II (Calculus Treatment)<br>and Lab Physics II (Calculus Treatment) | |
| **GER Distribution Requirement** | | |
| Arts | | 3 |
| Humanities | | 3 |
| Social Science | | 6 |
| ENGLISH 310 | Writing, Speaking, and Technoscience in the 21st Century | 3 |
| Cultural Diversity - Arts, Humanities, or Social Science course must also satisfy UWM Cultural Diversity Requirement | | |
| **Free Electives** | | |
| Select 2 credits | | 2 |
| **English Composition Requirement** | | |
| Satisfied by one of the following: | | 0-6 |

| | |
|---|---|
| Earning a satisfactory score on the English placement test; or | |
| Earning a grade of C or higher in ENGLISH 102; or | |
| Transferring a grade of C or higher in a course equivalent to ENGLISH 102 or higher expository writing course; or | |
| **Foreign Language Requirement** | |
| Satisfied by one of the following: | 0-8 |
| Two years of a single foreign language in high school; | |
| Two semesters of a single foreign language in college; or | |
| Demonstrate ability by examination. | |

[1] **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.

## Technical Electives

The electrical engineering program requires a total of 24 credits of technical electives, chosen as follows.

### Group A Technical Electives

All non-required Electrical Engineering courses numbered 400-699 are Group A Technical Electives.

| Code | Title | Credits |
|---|---|---|
| **Group A Technical Electives** | | |
| Select at least 18 credits from the following: | | 18-24 |
| BUS ADM 477 | Purchasing and Supply Management | |
| COMPSCI 459 | Fundamentals of Computer Graphics | |
| COMPSCI 520 | Computer Networks | |
| COMPSCI 530 | Computer Networks Laboratory | |
| EAS 1 | Engineering Co-op Work Period[1] | |
| EAS 497 | Study Abroad:[2] | |
| ELECENG 410 | Digital Signal Processing | |
| ELECENG 421 | Communication Systems | |
| ELECENG 436 | Introduction to Medical Instrumentation | |
| ELECENG 437 | Introduction to Biomedical Imaging | |
| ELECENG 451 | Introduction to VLSI Design | |
| ELECENG 457 | Digital Logic Laboratory | |
| ELECENG 458 | Computer Architecture | |
| ELECENG 461 | Microwave Engineering | |
| ELECENG 462 | Antenna Theory | |
| ELECENG 464 | Fundamentals of Photonics | |
| ELECENG 465 | Broadband Optical Networks | |
| ELECENG 471 | Electric Power Systems | |
| ELECENG 472 | Introduction to Wind Energy | |
| ELECENG 474 | Introduction to Control Systems | |
| ELECENG 482 | Introduction to Nanoelectronics | |
| ELECENG 490 | Topics in Electrical Engineering: | |
| ELECENG 541 | Integrated Circuits and Systems | |
| ELECENG 545 | FPGA Embedded CPUs & Firmware Development | |
| ELECENG 562 | Telecommunication Circuits | |
| ELECENG 565 | Optical Communication | |
| ELECENG 568 | Applications of Digital Signal Processing | |
| ELECENG 572 | Power Electronics | |
| ELECENG 574 | Intermediate Control Systems | |
| ELECENG 575 | Analysis of Electric Machines and Motor Drives | |
| ELECENG 588 | Fundamentals of Nanotechnology | |
| ELECENG 599 | Senior Thesis | |
| IND ENG 360 | Engineering Economic Analysis | |
| MECHENG 301 | Basic Engineering Thermodynamics | |
| MATLENG 481 | Electronic Materials | |
| MECHENG 321 | Basic Heat Transfer | |

**Group B Technical Electives**

| | |
|---|---|
| Select up to 6 credits from the following: | 0-6 |
| Any ATM SCI course 100-level or above | |
| Any BIO SCI course 150-level or above | |
| Any CHEM course 200-level or above, or CHEM 104[3] | |
| Any COMPSCI course 200-level or above | |
| Any PHYSICS course 300-level or above | |
| Any MATH course 400-level or above, or MATH 313, MATH 321, or MATH 322 | |

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

2 Students who earn 3 or more credits of Study Abroad may use 3 of those credits as approved technical electives.

3 Students who takeCHEM 102 andCHEM 104 (equaling a minimum of 8 credits) may use up to 3 credits ofCHEM 104 as Group B technical electives.

**This change affects the following types of students (check all that apply):**

New freshmen/transfers

**Does this program request require a new program code?**

No

**Does this program request require a new plan code?**

No

**Does this program request require a new subplan code?**

No

**Is this a change to eliminate a program?**

No

Key: 201

**ATTACHMENT 5**

## Revision to the Industrial Engineering B.S. Curriculum

Credits for Study Abroad will now be included as a technical elective in the Industrial Engineering B.S. Curriculum.

3.5 GRADUATE PROGRAM COMMITTEE (GPC)

3.5.1 Membership: The GPC shall consist of:

a. One member from each faculty unit (as specified below in 3.5.3.c) to be selected by the voting members of the unit's faculty. That member must be a member of the graduate faculty.

b. The Dean or a representative of the Dean serves in an ex-officio non-voting capacity.

3.5.2 Responsibilities:

a. Review all courses submitted by the departments for graduate credit and submit them to the College Graduate Program Committee. After such approval, transmit the courses, through the Dean's Office, to the Graduate School for further action.

b. The GPC shall be responsible for the policies and those duties assigned to it by the College Graduate Program Committee, for the administration of interdepartmental programs, and for the students in those programs in CEAS, currently, the Master of Science in Engineering and Doctor of Philosophy in Engineering. Specifically, for these programs, the GPC is responsible for:

1. Planning and policy decisions regarding the programs.
2. Determining entrance requirements, program standards, and guidelines for all students entering the program.
3. Review and approve exceptional aspects of student programs of study. Examples include
   - Ph.D. minors not on the list of automatically approved minors.
   - Interdisciplinary programs of study including substantial course work from outside the department (e.g. for PhD major area of concentration) or outside CEAS (e.g. for students in MS programs of study in concentrations that do not have this quality).
4. Recommend to the Graduate School on admission, continuation, and graduation of students.

c. The GPC may delegate day-to-day administration of the graduate programs and responsible contact with the Graduate School to faculty units, to subcommittees, or to administrative staff. In each case, the GPC retains basic authority and responsibility.

3.5.3 Election Procedures:

a. Elections for departmental representatives shall occur each Spring in time to be announced at or before the April College Faculty Meeting.

b. The Chair shall be elected annually by the Committee from its members at the first meeting of the academic year. The Chair shall be eligible to vote on all matters coming before the Committee.

c. The terms of office of each member shall be for two years and shall start at the beginning of the contractual period for each academic year. Unexcused absences from the Committee meetings for three consecutive times automatically vacates that position.

| **Representative** | **Year of Election** |
|---|---|
| Biomedical Engineering | Odd |
| Civil and Environmental Engineering | Odd |
| Computer Science | Even |
| Electrical Engineering | Odd |
| Industrial & Manufacturing Engineering | Odd |
| Materials Engineering | Even |
| Mechanical Engineering | Even |

d. Should a vacancy occur from among the departmental representatives, the procedures outlined in the "CEAS Committee Representative Replacement Policy" shall be followed. New members appointed following this policy will take office immediately.

e. If the Chairman's position becomes vacant, the vacancy shall be filled according to Section 3.5.3.d, after which the committee shall elect a new chairperson.

~~3.4 GRADUATE PROGRAM COMMITTEE~~

~~3.4.1 Membership:~~

~~a. The College Graduate Program Committee shall be the entire Graduate Faculty of the College of Engineering and Applied Science.~~

~~b. The Chairperson of the Graduate Program Subcommittee shall also be the Chairperson of the College Graduate Program Committee.~~[EVM1][JRR2]

~~3.4.2 Responsibilities:~~

~~a. Function as an overview committee for all graduate programs in the College.~~

~~b. Delegate the reviewing and screening function of all interdepartmental graduate programs to the Graduate Program Subcommittee (GPSC).~~

~~c. Delegate the reviewing and screening function of all departmental programs to the appropriate departments.~~

3.5 GRADUATE PROGRAM ~~SUB~~COMMITTEE (GP~~S~~C)

3.5.1 Membership: The GP~~S~~C shall consist of:

a. One member from each ~~department~~ faculty unit (as specified below in 3.5.3.c) to be selected by the voting members of the ~~departmental~~ unit's faculty. That member must be a member of the graduate faculty.

~~b. The College Representative(s) of the University of Wisconsin~~[JRR3]~~-Milwaukee Graduate Faculty Council (GFC) as voting member(s).~~

b~~c~~. The ~~dean and~~ Dean or a representative of the Dean~~associate deans of CEAS~~ serves in an ex-officio non-voting capacity.

3.5.2 Responsibilities:

a. Review all courses submitted by the departments for graduate credit and submit them to the College Graduate Program Committee. After such approval, transmit the courses, through the Dean's Office, to the Graduate School for further action.

b. The ~~GPSC~~GPC shall be responsible for the policies and those duties assigned to it by the College Graduate Program Committee, for the administration of interdepartmental programs, and for the students in those programs in CEAS, currently, the Master of Science in Engineering and Doctor of Philosophy in E~~e~~ngineering ~~and computer science~~. Specifically, for these programs, the ~~GPSC~~GPC is responsible for:

1. Planning and policy decisions regarding the programs.
2. Determining entrance requirements, program standards, and guidelines for all students entering the program.

~~3. Reviewing the qualifications of, and advising the Credentials Committee of the GFC and Graduate Dean, regarding the approval of faculty members of the respective departments to be authorized to direct dissertation research.~~

3~~4~~. ~~Appoint student program advisors and review and approve individual student programs.~~Review and approve exceptional[JRR4] aspects of student programs of study. Examples include

- Ph.D. minors not on the list of automatically approved minors.
- Interdisciplinary programs of study including substantial course work from outside the department (e.g. for PhD major area of concentration) or outside CEAS (e.g. for students in MS programs of study in concentrations that do not have this quality).

45. Recommend to the Graduate School on admission, continuation, and graduation of students.

c. The GPSCGPC may delegate day-to-day administration of the graduate programs and responsible contact with the Graduate School to departments, faculty units[JRR5], to subcommittees, or to administrative staff. In each case, the GPSCGPC retains basic authority and responsibility.[JRR6]

3.5.3 Election Procedures:

a. Elections for departmental representatives shall occur each Spring in time to be announced at or before the April College Faculty Meeting.

b. The Chair shall be elected annually by the Committee from its members at the first meeting after September 1of the academic year. The Chair shall be eligible to vote on all matters coming before the Committee.

c. The terms of office of each member shall be for two years and shall start September 1at the beginning of the contractual period for each academic year. Unexcused absences from the Committee meetings for three consecutive times automatically vacates that position.

| **Representative** | **Year of Election** |
|---|---|
| Biomedical Engineering | EvenOdd |
| Civil and Environmental Engineering | Odd |
| Computer Science | Even |
| Electrical -Engineering | Odd |
| Industrial & Manufacturing Engineering | Odd |
| Materials Engineering | Even |
| Mechanical Engineering | Even |

d. Should a vacancy occur from among the departmental representatives, the procedures outlined in the "CEAS Committee Representative Replacement Policy" shall be followed. New members appointed following this policy will take office immediately. Committee shall immediately notify the Chair of the department concerned, which then must elect a new member within one month to fill out the term of the vacated position.

e. New members elected according to procedure (d) above shall take office immediately upon their election. Their term of office shall be the remainder of the term of office of the original member replaced.[EVM7]

ef. If the Chairman's position becomes vacant, the vacancy shall be filled according to the preceding rulesto Section 3.5.3.d, after which the committee shall elect a new chairperson.