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 29, 2016   1:30 P.M.   EMS E180

A G E N D A

I.   ANNOUNCEMENTS

A.   2016-17 CEAS Committee Representatives – See Attachment 1

II.   INFORMAL REPORTS – See Attachment 2

A.   Opportunity for Questions regarding Informal Reports

III.   AUTOMATIC CONSENT BUSINESS

A.   Minutes of February 26, 2016 meeting

B.   New Courses and Course Changes – See Attachment 3

C.   Change to the Mechanical Engineering Curriculum – See Attachment 4

D.   Changes to the Civil Engineering Curriculum – See Attachment 5

E.   Changes to the Computer Science Curriculum – See Attachment 6

F.   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.*"

IV.   SPECIAL ORDER OF BUSINESS -- Nominations

A.   Awards and Recognition Committee

Only members of Electrical Engineering and Computer Science and Materials Science and Engineering may be nominated. Two members are to be elected.

Already Nominated:

Prof. Ichiro Suzuki – Computer Science

Continuing members:

Prof. Rani El-Hajjar – Civil and Environmental Engineering

V.   NEW BUSINESS

    A.   Comments from Chancellor Mark Mone and Provost Johannes Britz

    B.   CEAS Faculty Resolution on Proposed Campus Budget Model – See Attachment 7

    C.   Comments on State of CEAS from Dean Brett Peters

VI.   GENERAL GOOD AND WELFARE

VI.   ADJOURNMENT

                                   John R. Reisel, Secretary
                                   CEAS Faculty

JRR
Attachments

CEAS COMMITTEES FOR 2016-17

	TERM EXPIRES
1) **CURRICULUM COMMITTEE**	
Professor ? – Mechanical Engineering	2018
Professor Adeeb Rahman – Civil and Environmental Engineering	2018
Professor Chiu Law (Fall), W. Wang (Spring) – Electrical Engineering	2018
Professor Ben Church – Materials Science & Engineering	2017
Professor Matt Petering – Industrial Engineering	2017
Professor Guangwu Xu – Computer Science	2017
2) **GRADUATE PROGRAM SUBCOMMITTEE**	
Professor Ichiro Suzuki – Computer Science	2018
Professor ? - Mechanical Engineering	2018
Professor Hugo Lopez – Materials Science and Engineering	2018
Professor Robert Cuzner – Electrical Engineering	2017
Professor Wilkistar Otieno – Industrial Engineering	2017
Professor Jian Zhao – Civil and Environmental Engineering	2017
Professor– GFC Representative	
3) **ACADEMIC PLANNING COMMITTEE**	
Professor Jaejin Jang – Industrial Engineering	2019
Professor ? – Mechanical Engineering	2019
Professor Nidal Abu-Zahra – Materials Science & Engineering	2018
Professor Dev Misra – Electrical Engineering	2018
Professor Hector Bravo – Civil and Environmental Engineering	2017
Professor Hossein Hosseini - Computer Science	2017
4) **SCHOLASTIC APPEALS COMMITTEE**	
Professor Yi Hu – Electrical Engineering	2018
Professor Junjie Niu – Materials Science and Engineering	2018
Professor Al Ghorbanpoor – Civil and Environmental Engineering	2018
Professor Mukul Goyal – Computer Science	2017
Professor Jaejin Jang – Industrial Engineering	2017
Professor Nathan Salowitz – Mechanical Engineering	2017
5) **AWARDS AND RECOGNITION COMMITTEE**	
Professor	2018
Professor	2018
Professor Rani El-Hajjar – Civil and Environmental Engineering	2017

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

1) The APC worked on the Expectations of Chairperson document and the faculty input is being solicited at the moment before preparing the final draft.

2) The APC has started discussions to formulate assessment process and tools for the current programs in CEAS. Many associated issues, such as the undergraduate and graduate sections' enrollments, sections offered, improved students' experience, and engineering core courses with possible efficiencies were considered.

3) The APC is helping the Curriculum Committee with some suggestions to explore for a broad engineering core UG curriculum.

4) The Committee has started discussion on the CEAS Faculty Workload Policy on the basis of FD 2027.

5) Possible impact of the new budget model on CEAS was discussed and a resolution was initiated that is on this month's agenda of the CEAS Faculty meeting.

Biomedical and Health Informatics – Prof. McRoy

No Report

Faculty Senate – Prof. Reisel

The Board of Regents has passed regent policies on tenure, post-tenure review, and faculty lay-off. The changes to the policy on tenure were minimal, but the post-tenure review changes and the new faculty lay-off policy need careful attention. Briefly, thorough, formal post-tenure reviews of faculty will need to be performed, and faculty employment can be terminated following a negative review. UWM P&P will need to be adjusted for these new procedures, and the campus needs to forward these changes to the Board for approval by December.

The faculty should also be aware that faculty can now be laid off with no approval by faculty bodies through program discontinuation for educational considerations. The Regents wish to see revised P&P from campuses reflecting this, although no deadline has been given for this. During its April 14, 2016 meeting, the Senate provided guidance that UWM should wait until next academic year to forward documents. The Board of Regents amended and approved policies from UW-Madison which were originally favorable to faculty, but are essentially in-line with Regent policy (and very unfavorable to faculty) at their April meeting. Originally, it was thought that all campuses would follow Madison's lead, but with these amended policies in place, that strategy is now being questioned.

In addition, the University Committee is providing more frequent information regarding the budget situation and its other activities at http://UCNews.uwm.edu.

Graduate Faculty Committee – Prof. Hosseini

1) Carnegie R1 Research Recognition - It was discussed that number of PhD programs, number of PhD graduates, and the amount of research expenditures were some of the main factors for our recent Carnegie R1 research recognition.

2) Curricular Area Codes - GFC will consider Computer Studies (COMPST) as a new curriculum area in next GFC meeting.

3) English Proficiency Policy - Committee discussed for the graduate student admission the possibility of allowing graduate students taking either TOFEL test or ESL courses on campus at UWM to meet their English proficiency requirements.

4) Graduate Student Advisor - Committee discussed the possibility of allowing retired faculty to retain Graduate Faculty status for a limited term such as three years for serving as chair or co-chair of a graduate student committee.

5) Clearinghouse for Graduate-Level Courses - Committee discussed the possibility of allowing graduate students having the option taking compatible courses from other departments to meet their coursework requirements when their own department does not offer those courses due to low enrollment or course cancellation.

NEW COURSES

BME 585   ADVANCED BIOMATERIALS, 3 cr., U/G
                  Theory and application of advanced biomaterials including cardiovascular
                  devices, orthopedic applications, drug delivery systems, biosensors, and
                  tissue engineering. Jointly offered with and counts as repeat of
                  MATLENG585.
                  Prereq: Sr St, Matleng 385 or BME 385 or consent of instructor.

MATLENG 585   ADVANCED BIOMATERIALS, 3 cr., U/G
                  Theory and application of advanced biomaterials including cardiovascular
                  devices, orthopedic applications, drug delivery systems, biosensors, and
                  tissue engineering. Jointly offered with and counts as repeat of BME 585.
                  Prereq: Sr St, Matleng 385 or BME 385 or consent of instructor.

COURSE CHANGES

COMPSCI 250 (201) INTRODUCTORY COMPUTER PROGRAMMING, 3 cr., U
                  Problem solving with structured programming techniques using an object-
                  oriented programming language, including control structures, functions,
                  arrays, vectors, and pre-defined objects.
                  Prereq: Math Placement level B.

                              had been

COMPSCI 250 (201) INTRODUCTORY COMPUTER PROGRAMMING, 3 cr., U
                  Problem solving with structured programming techniques using an object-
                  oriented programming language, including control structures, functions,
                  arrays, vectors, and pre-defined objects.
                  Prereq: Math Placement Code of 40 or Math 116(P) or Math 211(P).

COMPSCI 317   DISCRETE INFORMATION STRUCTURES, 3 cr., U
                  Introductory discussion of logic, proof techniques, sets, functions,
                  relations, combinatorics, probability, and graphs.
                  Prereq: Math Placement A; grade of C or better in CompSci 250 (201)(P).

                              had been

COMPSCI 317   DISCRETE INFORMATION STRUCTURES, 3 cr., U
                  Introductory discussion of logic, proof techniques, sets, functions,
                  relations, combinatorics, probability, and graphs.
                  Prereq: grade of C or better in Math 221(P), 226(P) or 231(P); CompSci
                  250 (201)(P)

COMPSCI 417(517)   INTRODUCTION TO THE THEORY OF COMPUTATION, 3 cr., U/G
Introduction to formal languages, grammars and automata. Finite state
automata, pushdown automata, turing machines. Regular, context-free
recursive and recursively enumerable languages. Decidability.
Prereq: jr st;grade of C or better in CompSci 317(P) or grade of C or
better in Math 341(P).

had been

COMPSCI 417(517)   INTRODUCTION TO THE THEORY OF COMPUTATION, 3 cr., U/G
Introduction to formal languages, grammars and automata. Finite state
automata, pushdown automata, turing machines. Regular, context-free
recursive and recursively enumerable languages. Decidability.
Prereq: jr st; Math 221(P) or 232(P), grade of C or better in CompSci
317(217)(P).

COMPSCI 535   ALGORITHM DESIGN AND ANALYSIS, 3 cr., U/G
Introduction to abstract data structures, analysis of time and space
requirements of numerical and non-numerical algorithms methods for
data manipulation.
Prereq: jr st; Math 211(P), 213(P), 221(P) or 231(P); C or better in both
CompSci 317(P) & 351(P).

had been

COMPSCI 535   ALGORITHM DESIGN AND ANALYSIS, 3 cr., U/G
Introduction to abstract data structures, analysis of time and space
requirements of numerical and non-numerical algorithms methods for
data manipulation.
Prereq: jr st; C or better in both CompSci 317(217)(P) & 351(252)(P).

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).

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 330(P), 354(P).

Change to the Mechanical Engineering Curriculum

As illustrated on the following pages, the requested change to the Mechanical Engineering Curriculum is the reclassification of MechEng 411 from a Group B technical elective to a Group A technical elective.

University of Wisconsin – Milwaukee
College of Engineering and Applied Science
MECHANICAL ENGINEERING CURRICULUM (proposed)

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 (34 credits)

		Credits	Prerequisite
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)
EAS 200	Professional Seminar	1	None
ElecEng 301	Electrical Circuits I	3	Physics 210(C)
MatlEng 201	Engineering Materials	4	Chem 102 or 105
MechEng 101	Computational Tools for Engineers	2	Math 221(C) or 231(C)
MechEng 110	Engineering Fundamentals I	4	Math 225(C) or 231(C), Admission to CEAS
MechEng 111	Engineering Fundamentals II	4	MechEng 110, Admission to CEAS
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	Civ Eng 202, ElecEng 234, MechEng 301(C)

^Mechanical Engineering Major (33 credits)

		Credits	Prerequisite
Ind Eng 467	Intro. Statistics for Physical Science & Engineering Students	3	Jr St, Math 233
Matl Eng 330	Materials & Processes in Manufacturing	3	MatlEng 201
MechEng 321	Basic Heat Transfer	4	Jr St, MechEng 301
MechEng 323	Fluid Mechanics Laboratory	1	Jr St, MechEng 320
MechEng 360	Mechanical Design I	3	Civ Eng 202, MechEng 101, 111
MechEng 366	Design of Machine Elements	4	Civ Eng 303, MatlEng 201, MechEng 101, 111
MechEng 370	Computer Aided Engineering Laboratory	2	Civ Eng 202, 303, ElecEng 234, MechEng 101, 111
MechEng 438	Mechanical Engineering Experimentation	3	Sr St, ElecEng 301, Ind Eng 467, MechEng 321, 360, 366
MechEng 474	Introduction to Control Systems	4	Sr St, Civ Eng 202*, Elec Eng 234*, 301
MechEng 479	Control & Design of Mechatronic Systems	3	Sr St, ElecEng 474 or Mech Eng 474
MechEng 405	Product Realization	3	Jr St, MechEng 321, 360, 366, 370
or			
MechEng 496	Senior Design Project	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	
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 232*

^^Chemistry (5-10 credits)

One of the following courses must be completed:

	Credits	
Chem 105 (Suggested) or Chem 102-104	5	Chem 100* or Chemistry Placement; Math 105* or 108*

Physics (10 credits)

	Credits	
Physics 209 & 214 (Lab), and Physics 210 & 215 (Lab)	10	Physics 209: Math 232(C)
		Physics 210: Math 233(C), C- or better in Physics 209

General Education Requirements

Distribution Requirements (15 credits)

		Credits	
Art		3	
Humanities		3	
Social Science		6	
English 310	Writing, Speaking & Technoscience in the 21st Century	3	English Competency

Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

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 **or**
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

---

*C or better in prerequisite   **(C) Concurrent Enrollment in Designated Course**

---

^Advancement to Major: 1. Complete MechEng 101, 110, Chem 105 (or 102), Physics 209 & 214. 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 2016

Technical Electives – Mechanical Engineering Major

The Mechanical Engineering program requires a total of 15 credits of technical electives, chosen as follows.

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

		Credits	Prerequisite
MechEng 402	Thermal-Fluid Engineering	3	MechEng 320, 321
MechEng 411	Heat Transfer	3	Jr St, 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	Jr St, Civ Eng 303, ElecEng 234, MechEng 320(C), 321(C)
MechEng 475	Vibrations in Mechanical Design	3	Sr St, Civ Eng 202, ElecEng 234

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) or ElecEng 234(C)
Math 601	Advanced Engineering Mathematics	3	Jr St, ElecEng 234 or Math 234
Mech Eng 405	Product Realization[1]	3	Jr St, IndEng 350, 360, 370 or MechEng 321, 360, 366, 370
MechEng 415	Modern Thermo Manufacturing Processes	3	Jr St, Civ Eng 303, MechEng 321
MechEng 423	Applied Fluid Mechanics	3	Jr St, MechEng 320
MechEng 425	Aerodynamics of Wind Turbines	3	Jr St, MechEng 320
MechEng 430	Energy Modeling	3	Jr St
MechEng 432	Internal Combustion Engines	3	Jr St, MechEng 301
MechEng 434	Air Conditioning System Design	3	Jr St, Ind Eng 210, MechEng 321
MechEng 435	Power Plant Theory & 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 & Nanomanufacturing	3	Jr St, MatlEng 201
MechEng 461	Intermediate Kinematics & Dynamics	3	Jr St, MechEng 360
MechEng 465	Friction & Wear	3	Jr St, MatlEng 201
MechEng 466	Mechanics of Composite Materials	3	Jr St, Civ Eng 303
MechEng 469	Introduction to Biomechanical Engineering	3	Civ Eng 202, 303
MechEng 472	Introduction to Wind Energy	3	Jr St
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, ElecEng 474 or 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
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.

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

		Credits	Prerequisite
BusAdm 447	Entrepreneurship	3	Jr St, BusAdm 350
EAS 001	Co-op Work Period	3	Prior Cons Co-Op Dir
EAS 497	Study Abroad	3	Acceptance to Study Abroad Program
Ind Eng 360	Engineering Economic Analysis	3	Jr St
MechEng 490	Professional development topics such as Innovation & Commercialization, Tech Comm for Eng & Science	3	Jr St, Cons Instr
MechEng 542	Introduction to Technological Entrepreneurship	3	Jr St, Admission to Major
MechEng 543	Intro to Tech Mgmt & 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, BusAdm/MechEng 542, Admission to Major

*C or better in prerequisite	(C) Concurrent Enrollment in Designated Course

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.

Effective Fall 2016

University of Wisconsin – Milwaukee
College of Engineering and Applied Science
MECHANICAL ENGINEERING CURRICULUM (current)

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 (34 credits)

		Credits	Prerequisite
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)
EAS 200	Professional Seminar	1	None
ElecEng 301	Electrical Circuits I	3	Physics 210(C)
MatlEng 201	Engineering Materials	4	Chem 102 or 105
MechEng 101	Computational Tools for Engineers	2	Math 221(C) or 231(C)
MechEng 110	Engineering Fundamentals I	4	Math 225(C) or 231(C), Admission to CEAS
MechEng 111	Engineering Fundamentals II	4	MechEng 110, Admission to CEAS
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	Civ Eng 202, ElecEng 234, MechEng 301(C)

^Mechanical Engineering Major (33 credits)

		Credits	Prerequisite
Ind Eng 467	Intro. Statistics for Physical Science & Engineering Students	3	Jr St, Math 233
Matl Eng 330	Materials & Processes in Manufacturing	3	MatlEng 201
MechEng 321	Basic Heat Transfer	4	Jr St, MechEng 301
MechEng 323	Fluid Mechanics Laboratory	1	Jr St, MechEng 320
MechEng 360	Mechanical Design I	3	Civ Eng 202, MechEng 101, 111
MechEng 366	Design of Machine Elements	4	Civ Eng 303, MatlEng 201, MechEng 101, 111
MechEng 370	Computer Aided Engineering Laboratory	2	Civ Eng 202, 303, ElecEng 234, MechEng 101, 111
MechEng 438	Mechanical Engineering Experimentation	3	Sr St, ElecEng 301, Ind Eng 467, MechEng 321, 360, 366
MechEng 474	Introduction to Control Systems	4	Sr St, Civ Eng 202*, Elec Eng 234*, 301
MechEng 479	Control & Design of Mechatronic Systems	3	Sr St, ElecEng 474 or Mech Eng 474
MechEng 405	Product Realization	3	Jr St, MechEng 321, 360, 366, 370
or			
MechEng 496	Senior Design Project	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 232*

^^Chemistry (5-10 credits)

One of the following courses must be completed:

	Credits	Prerequisite
Chem 105 (Suggested) or Chem 102-104	5	Chem 100* or Chemistry Placement; Math 105* or 108*

Physics (10 credits)

	Credits	Prerequisite
Physics 209 & 214 (Lab), and Physics 210 & 215 (Lab)	10	Physics 209: Math 232(C)
		Physics 210: Math 233(C), C- or better in Physics 209

General Education Requirements

Distribution Requirements (15 credits)

	Credits	Prerequisite
Art	3	
Humanities	3	
Social Science	6	
English 310 Writing, Speaking & Technoscience in the 21st Century	3	English Competency

Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

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 **or**
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

---

*C or better in prerequisite   **(C) Concurrent Enrollment in Designated Course**

---

^Advancement to Major: 1. Complete MechEng 101, 110, Chem 105 (or 102), Physics 209 & 214. 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

The Mechanical Engineering program requires a total of 15 credits of technical electives, chosen as follows.

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

		Credits	Prerequisite
MechEng 402	Thermal-Fluid Engineering	3	MechEng 320, 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	Jr St, Civ Eng 303, ElecEng 234, MechEng 320(C), 321(C)
MechEng 475	Vibrations in Mechanical Design	3	Sr St, Civ Eng 202, ElecEng 234

Group B Technical Electives:

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) or ElecEng 234(C)
Math 601	Advanced Engineering Mathematics	3	Jr St, ElecEng 234 or Math 234
Mech Eng 405	Product Realization[1]	3	Jr St, IndEng 350, 360, 370 or MechEng 321, 360, 366, 370
MechEng 411	Heat Transfer	3	Jr St, MechEng 321
MechEng 415	Modern Thermo Manufacturing Processes	3	Jr St, Civ Eng 303, MechEng 321
MechEng 423	Applied Fluid Mechanics	3	Jr St, MechEng 320
MechEng 425	Aerodynamics of Wind Turbines	3	Jr St, MechEng 320
MechEng 430	Energy Modeling	3	Jr St
MechEng 432	Internal Combustion Engines	3	Jr St, MechEng 301
MechEng 434	Air Conditioning System Design	3	Jr St, Ind Eng 210, MechEng 321
MechEng 435	Power Plant Theory & 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 & Nanomanufacturing	3	Jr St, MatlEng 201
MechEng 461	Intermediate Kinematics & Dynamics	3	Jr St, MechEng 360
MechEng 465	Friction & Wear	3	Jr St, MatlEng 201
MechEng 466	Mechanics of Composite Materials	3	Jr St, Civ Eng 303
MechEng 469	Introduction to Biomechanical Engineering	3	Civ Eng 202, 303
MechEng 472	Introduction to Wind Energy	3	Jr St
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, ElecEng 474 or 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
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.

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

BusAdm 447	Entrepreneurship	3	Jr St, BusAdm 350
EAS 001	Co-op Work Period	3	Prior Cons Co-Op Dir
EAS 497	Study Abroad	3	Acceptance to Study Abroad Program
Ind Eng 360	Engineering Economic Analysis	3	Jr St
MechEng 490	Professional development topics such as Innovation & Commercialization, Tech Comm for Eng & Science	3	Jr St, Cons Instr
MechEng 542	Introduction to Technological Entrepreneurship	3	Jr St, Admission to Major
MechEng 543	Intro to Tech Mgmt & 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, BusAdm/MechEng 542, Admission to Major

*C or better in prerequisite	**(C) Concurrent Enrollment in Designated Course**

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.

College of Engineering and Applied Science
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 Mechanical Engineering (414) 229-5191
Engineering & Mathematical Science Building (EMS) Room 506

Web Site: www.ceas.uwm.edu

Effective Fall 2015

Changes to the Civil Engineering Curriculum

The following pages contain the proposed curriculum and the current curriculum.

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

Proposed (Marked)

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Civil Engineering is 127 credits. Students who need background preparation courses in math, English, and chemistry may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (33 credits)

		Credits	Prerequisite
EAS 100	CEAS Freshman Orientation (recommended only)	1	none
EAS 200	Professional Seminar	1	none
Ind Eng 111	Introduction to Engineering[1]	3	Math 116 (C)
Ind Eng 112	Engineering Drawing & Computer Aided Design/Drafting[1]	3	Math 116
Ind Eng 360	Engineering Economic Analysis	3	Jr St
Civ Eng 280	Computer-Based Engineering Analysis	3	Math 226 or 231, CompSci 132 or equivalent
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[2]	4	Chem 105 or 102 or 117
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	MechEng 301 (C), ElecEng 234, Civ Eng 202

[1] MechEng 110 and 111 may substitute for Ind Eng 111 and 112 for students transferring from another engineering major.

[2] Civil Engineering majors may take Civ Eng 431 (with proper prerequisites) in place of MatlEng 201.

*Civil Engineering Major (~~24~~ 23 credits)

		Credits	Prerequisite
Civ Eng 250	Engineering Surveying	3	Soph. St.,Math232
Civ Eng 335	Soil Mechanics	~~4~~3	Civ Eng 303
Civ Eng 372	Introduction to Structural Design	4	Jr St, Civ Eng 303
Civ Eng 411	Engineering Principles of Water Resources Design	3	Jr St, MechEng 320
Civ Eng 413	Environmental Engineering	3	Mech Eng 320
Civ Eng 490	Transportation Engineering	3	Civ Eng 280, Jr St
Civ Eng 494	Principles of Civil Engineering Design	1	Sr. St. in Civil Engineering
Civ Eng 495	Senior Design	3	Civ Eng 335,372,411,490

**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 "C" grade.
Or Math 221- 222 (Honors)	10	
And ElecEng 234 Analytical Methods in Engineering	4	Math 233 (P)

**Chemistry (5-10 credits)

One of the following sequences must be completed:

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

Physics (8 credits)

Physics 209 – 210   8

Other Natural Sciences (3 credits)

Any geology course 300 level or above, or
Any biology course 150-level or above, or
Any atmospheric science course 200 level or above

General Education Requirements

Distribution Requirements (15 credits)

	Credits	Prerequisite
Art	3	none
Humanities	3	none
Social Science	6	none
English 310 Writing, Speaking and Technoscience in the 21st Century	3	English competency

Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

~~Free Elective   2~~

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 of 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

* Advancement to Major: Effective Fall 2012 1. Complete a minimum of 24 credits required for major. (Excludes: general education, prerequisite and orientation courses). 2. Complete Math 232 (or 222) with "C" or better grade. 3. Complete EAS 200 Professional Seminar. 4. Complete the English composition requirement. 5. Obtain a 2.33 GPA in all courses in item 1. **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 2016

| **Technical Electives – Civil Engineering 21 24 CREDITS REQUIRED**

The Civil Engineering and Mechanics Department offers numerous elective courses which allow students to work in one of **four areas** of concentration. Normally a minimum of 12 credits will be taken in an area of concentration. **Students who do not follow one of the four areas of concentration will require approval by the Department Chairperson for their programs.**

1 Students interested in **geotechnical engineering** should take Civ Eng 456, and select at least three courses from Civ Eng 360, 412, 463, 492, and 598.

2 Students interested in **municipal and transportation engineering** should select at least three courses from Civ Eng 492, 590, 592, 594, 596,598, and 610.

3 Students interested in **structural engineering** should take Civ Eng 360, 463, 571, 572 and select at least two courses from Civ Eng 431, 456, 466, 560, 573, 574 and 579.

4 Students interested in **water resources and environmental engineering** should select at least three courses from Civ Eng 412, 511, 521, and 610

Group A Technical Electives: Take 15 18 to 21 24 credits of Group A electives.

		Credits	Prerequisite
Civ Eng 311	Introduction to Energy, Environment and Sustainability	3	Jr. St.
Civ Eng 360	Introduction to Structural Analysis	3	Civ Eng 303
Civ Eng 412	Applied Hydrology	3	Jr St, Math 233, MechEng 320
Civ Eng 431	Materials of Construction	3	Jr. St, Civ Eng 303
Civ Eng 456	Foundation Engineering	3	Jr St, Civ Eng 335
Civ Eng 463	Introduction to Finite Elements	3	ElecEng 234,Civ Eng 303, MechEng 320 (C)
Civ Eng 466	Mechanics of Composite Materials	3	Jr. St, Civ Eng 303
Civ Eng 492	Environmental Impact Assessment	3	Sr. St.
Civ Eng 502	Experimental Stress Analysis	3	Jr. St. Civ Eng 303
Civ Eng 511	Water Supply and Sewerage	3	Jr St, Civ Eng 411
Civ Eng 521	Water Quality Assessment	3	Sr. St, Civ Eng 411
Civ Eng 555	Sustainable Construction Materials and Technologies	3	Jr. St.
Civ Eng 560	Intermediate Structural Analysis	3	Jr. St., 360, 372
Civ Eng 571	Design of Concrete Structures	3	Jr. St. Civ Eng 360 (C), 372
Civ Eng 572	Design of Steel Structures	3	Jr St, Civ Eng 360 (C) ,372
Civ Eng 573	Design of Masonry Structures	3	Jr. St, Civ Eng 360 (C) ,372
Civ Eng 574	Design of Prestressed Concrete Structures	3	Jr St Civ Eng 360 (C) , 372
Civ Eng 579	Earthquake Engineering	3	Sr St, Civ Eng 571 or 572
Civ Eng 590	Urban Transportation Planning	3	Sr. St.
Civ Eng 592	Traffic Control	3	Sr. St.
Civ Eng 594	Physical Planning and Municipal Engineering	3	Sr. St., Cons Instr
Civ Eng 596	Transportation Facilities Design	3	Civ Eng 335 (C), Civ Eng 490
Civ Eng 598	Pavement Analysis and Design	3	Jr. St, Civ Eng 335
Civ Eng 610	Introduction to Water and Sewage Treatment	3	Sr. St., Civ Eng 413
Civ Eng 480	Software Applications for Civil Engineering	3	Jr. St.
Civ Eng 616	Computational Hydraulics and Environmental Flows	3	Jr. St., Civ Eng 411
Civ Eng 691	Topics in Civil Engineering	3	Based on topic

All non-required Civil and Environmental Engineering courses numbered 400-699 are Group A Technical Electives

Group B Technical Electives: Select no more than 6 credits from this list.

			Prerequisite
EAS 001	Co-op Work Period	3[2]	None
English 206	Technical Writing	3	Soph St, Eng Comp Reqmt
Geog 403	Remote Sensing	3	Jr St; Geo 215
Comp Sci 250	Introductory Computer Programming	3	Math Placement code 40 or Math 116 or Math 211
ElecEng 301	Electrical Circuits	3	Physics 210
Ind Eng 455	Operations Research I	3	Jr St, Math 233
Ind Eng 465	Operations Research II	3	Ind Eng 467, 455
Ind Eng 467	Intro Statistics for Physical Sciences & Engineering	3	Jr St, Math 233
Ind Eng 575	Design of Experiments	3	Ind Eng 467 or Equivalent
MatlEng 431	Welding Engineering	3	Jr. St, MatlEng 201
MechEng 321	Basic Heat Transfer	4	MechEng 301
Urb Plan 591	Introduction to Urban Geographic Information Systems	3	Jr. St.
Geog 215	Introduction to Geographic Information Sciences	3	None

Any Mathematics course 400-level or above, Math 313, Math 321, Math 322, or
Any Chemistry course 200-level or above, Chem 104[1], or
Any Physics course 300-level or above, Physics 214, Physics 215

[1]Students who take Chemistry 102 (or 117) may use Chemistry 104 (118) to satisfy three credits in this group.
[2]Students who earn **3 or more** credits of Co-op may use 3 of those credits as approved technical electives.

Effective Fall 2016

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

Current

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Civil Engineering is 127 credits. Students who need background preparation courses in math, English, and chemistry may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (33 credits)

		Credits	Prerequisite
EAS 100	CEAS Freshman Orientation (recommended only)	1	none
EAS 200	Professional Seminar	1	none
Ind Eng 111	Introduction to Engineering[1]	3	Math 116 (C)
Ind Eng 112	Engineering Drawing & Computer Aided Design/Drafting[1]	3	Math 116
Ind Eng 360	Engineering Economic Analysis	3	Jr St
Civ Eng 280	Computer-Based Engineering Analysis	3	Math 226 or 231, CompSci 132 or equivalent
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[2]	4	Chem 105 or 102 or 117
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	MechEng 301 (C), ElecEng 234, Civ Eng 202

[1] MechEng 110 and 111 may substitute for Ind Eng 111 and 112 for students transferring from another engineering major.

[2] Civil Engineering majors may take Civ Eng 431 (with proper prerequisites) in place of MatlEng 201.

*Civil Engineering Major (24 credits)

Civ Eng 250	Engineering Surveying	3	Soph. St.,Math232
Civ Eng 335	Soil Mechanics	4	Civ Eng 303
Civ Eng 372	Introduction to Structural Design	4	Jr St, Civ Eng 303
Civ Eng 411	Engineering Principles of Water Resources Design	3	Jr St, MechEng 320
Civ Eng 413	Environmental Engineering	3	Mech Eng 320
Civ Eng 490	Transportation Engineering	3	Civ Eng 280, Jr St
Civ Eng 494	Principles of Civil Engineering Design	1	Sr. St. in Civil Engineering
Civ Eng 495	Senior Design	3	Civ Eng 335,372,411,490

**Mathematics (14 -16 credits)

(16 credits typical: Math 231,232,233, ElecEng 234)

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

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

**Chemistry (5-10 credits)

One of the following sequences must be completed:
Chem 105 (Suggested) or Chem 102 -104   Chem 100 with "C" grade or Chemistry placement test

Physics (8 credits)

Physics 209 – 210   8

Other Natural Sciences (3 credits)

Any geology course 300 level or above, or
Any biology course 150-level or above, or
Any atmospheric science course 200 level or above

General Education Requirements

Distribution Requirements (15 credits)

Art	3	none
Humanities	3	none
Social Science	6	none
English 310 Writing, Speaking and Technoscience in the 21st Century	3	English competency

Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

Free Elective   2

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 of 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

* **Advancement to Major:** Effective Fall 2012 1. Complete a minimum of 24 credits required for major. (Excludes: general education, prerequisite and orientation courses). 2. Complete Math 232 (or 222) with "C" or better grade. 3. Complete EAS 200 Professional Seminar. 4. Complete the English composition requirement. 5. Obtain a 2.33 GPA in all courses in item 1. **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 2016

Technical Electives – Civil Engineering 21 CREDITS REQUIRED

The Civil Engineering and Mechanics Department offers numerous elective courses which allow students to work in one of **four areas** of concentration. Normally a minimum of 12 credits will be taken in an area of concentration. **Students who do not follow one of the four areas of concentration will require approval by the Department Chairperson for their programs.**

1 Students interested in **geotechnical engineering** should take Civ Eng 456, and select at least three courses from Civ Eng 360, 412, 463, 492, and 598.

2 Students interested in **municipal and transportation engineering** should select at least three courses from Civ Eng 492, 590, 592, 594, 596,598, and 610.

3 Students interested in **structural engineering** should take Civ Eng 360, 463, 571, 572 and select at least two courses from Civ Eng 431, 456, 466, 560, 573, 574 and 579.

4 Students interested in **water resources and environmental engineering** should select at least three courses from Civ Eng 412, 511, 521, and 610

Group A Technical Electives: Take 15 to 21 credits of Group A electives.

		Credits	Prerequisite
Civ Eng 311	Introduction to Energy, Environment and Sustainability	3	Jr. St.
Civ Eng 360	Introduction to Structural Analysis	3	Civ Eng 303
Civ Eng 412	Applied Hydrology	3	Jr St, Math 233, MechEng 320
Civ Eng 431	Materials of Construction	3	Jr. St, Civ Eng 303
Civ Eng 456	Foundation Engineering	3	Jr St, Civ Eng 335
Civ Eng 463	Introduction to Finite Elements	3	ElecEng 234,Civ Eng 303, MechEng 320 (C)
Civ Eng 466	Mechanics of Composite Materials	3	Jr. St, Civ Eng 303
Civ Eng 492	Environmental Impact Assessment	3	Sr. St.
Civ Eng 502	Experimental Stress Analysis	3	Jr. St. Civ Eng 303
Civ Eng 511	Water Supply and Sewerage	3	Jr St, Civ Eng 411
Civ Eng 521	Water Quality Assessment	3	Sr. St, Civ Eng 411
Civ Eng 555	Sustainable Construction Materials and Technologies	3	Jr. St.
Civ Eng 560	Intermediate Structural Analysis	3	Jr. St., 360, 372
Civ Eng 571	Design of Concrete Structures	3	Jr. St. Civ Eng 360 (C), 372
Civ Eng 572	Design of Steel Structures	3	Jr St, Civ Eng 360 (C) ,372
Civ Eng 573	Design of Masonry Structures	3	Jr St, Civ Eng 360 (C) ,372
Civ Eng 574	Design of Prestressed Concrete Structures	3	Jr St Civ Eng 360 (C) , 372
Civ Eng 579	Earthquake Engineering	3	Sr St, Civ Eng 571 or 572
Civ Eng 590	Urban Transportation Planning	3	Sr. St.
Civ Eng 592	Traffic Control	3	Sr. St.
Civ Eng 594	Physical Planning and Municipal Engineering	3	Sr. St., Cons Instr
Civ Eng 596	Transportation Facilities Design	3	Civ Eng 335 (C), Civ Eng 490
Civ Eng 598	Pavement Analysis and Design	3	Jr. St, Civ Eng 335
Civ Eng 610	Introduction to Water and Sewage Treatment	3	Sr. St., Civ Eng 413
Civ Eng 480	Software Applications for Civil Engineering	3	Jr. St.
Civ Eng 616	Computational Hydraulics and Environmental Flows	3	Jr. St., Civ Eng 411
Civ Eng 691	Topics in Civil Engineering	3	Based on topic

All non-required Civil and Environmental Engineering courses numbered 400-699 are Group A Technical Electives

---

Group B Technical Electives: Select no more than 6 credits from this list.

		Credits	Prerequisite
EAS 001	Co-op Work Period	3[2]	None
English 206	Technical Writing	3	Soph St, Eng Comp Reqmt
Geog 403	Remote Sensing	3	Jr St; Geo 215
Comp Sci 250	Introductory Computer Programming	3	Math Placement code 40 or Math 116 or Math 211
ElecEng 301	Electrical Circuits	3	Physics 210
Ind Eng 455	Operations Research I	3	Jr St, Math 233
Ind Eng 465	Operations Research II	3	Ind Eng 467, 455
Ind Eng 467	Intro Statistics for Physical Sciences & Engineering	3	Jr St, Math 233
Ind Eng 575	Design of Experiments	3	Ind Eng 467 or Equivalent
MatlEng 431	Welding Engineering	3	Jr. St, MatlEng 201
MechEng 321	Basic Heat Transfer	4	MechEng 301
Urb Plan 591	Introduction to Urban Geographic Information Systems	3	Jr. St.
Geog 215	Introduction to Geographic Information Sciences	3	None

Any Mathematics course 400-level or above, Math 313, Math 321, Math 322, or
Any Chemistry course 200-level or above, Chem 104[1], or
Any Physics course 300-level or above, Physics 214, Physics 215

[1]Students who take Chemistry 102 (or 117) may use Chemistry 104 (118) to satisfy three credits in this group.
[2]Students who earn **3 or more** credits of Co-op may use 3 of those credits as approved technical electives.

Effective Fall 2016

Changes to the Computer Science Curriculum

The following describes the proposed change to the Computer Science Curriculum.

Action **CHANGE**
Major **Computer Science**

UW-MILWAUKEE ONLINE PROGRAM CHANGE FORM

I. Current

...

COMPUTER SCIENCE CURRICULUM

Computer Science Major: 53 credits

...

CompSci 557   Introduction to Database Systems   3
...

Mathematics Requirement: 8 credits

One of the following Calculus sequences must be completed:

Math 231-232 or

Math 221-222 (Honors)

...

TECHNICAL ELECTIVES – Select 12 credits from the following three lists:

...

Computer Science Electives (Select 6 to 12 credits.)

...

Applied Mathematics Electives (Select 6 credits from the following list.)

Math 233	Calculus and Analytic Geometry III	4
ElecEng 234	Analytical Methods in Engineering	4
Math 240	Matrices and Applications	3
Math 320	Introduction to Differential Equations	
Math 431	Modern Algebra with Applications	3
Math 451	Axiomatic Geometry	3
MthStat 361	Introduction to Mathematical Statistics I	3
Ind Eng 467	Introductory Statistics for Physical Sciences and Engineering Students	3
Math 234	(Alternative to ElecEng 234)	4
Math 467	(Equivalent to Ind Eng 467)	3

II. Proposed Change Summary

```
CompSci 557 is removed from the major curriculum.
Three credits of Computer Science technical electives are added
The major now requires only one semester of calculus.
Three additional credits of mathematics electives are added.
Many new mathematics elective courses are added.
```

III. Effects

Additional Faculty Required

Four-Year Faculty Needs

Library Resources

Required Additional Facilities and Equipment

Program Costs

Resource Reallocation

IV. Justification

We are removing "Introduction to Database Systems", and adding three credits of technical electives, partly in response to the APCC review of CompSci. We are also considering adding tracks of electives that recognize students who get deeper into selected subjects.

We want to give the opportunity for our students to take other math courses (statistics, linear optimization and discrete mathematics) rather than a second semester of calculus. This substitution often yields mathematics courses more relevant to a modern Computer Science degree.

V. New Copy

...

COMPUTER SCIENCE CURRICULUM

Computer Science Major: 50 credits

...

REMOVE: CompSci Introduction to Database Systems   3
557
...

Mathematics Requirement: 4 credits

One of the following Calculus courses must be completed:

Math 211, Math 213, Math 221, Math 231

...

TECHNICAL ELECTIVES – Select 15 credits from the following three lists:

...

Computer Science Electives (Select 9 to 15 credits.)

...

Applied Mathematics Electives (Select 9 credits from the following list.)

Math 232   *Calculus and Analytic Geometry II*

Math 313   *Linear Programming and Optimization*

Math 315   *Mathematical Programming and Optimization*

Math 305   *Introduction to Mathematical and Computational Modeling*

Math 405   *Mathematical Models and Applications*

MthStat 469   *Biostatistics*

MthStat 563   *Regression Analysis*

[Remaining unchanged]

Math 233	Calculus and Analytic Geometry III	4
ElecEng 234	Analytical Methods in Engineering	4
Math 240	Matrices and Applications	3
Math 320	Introduction to Differential Equations	
Math 431	Modern Algebra with Applications	3
Math 451	Axiomatic Geometry	3
MthStat 361	Introduction to Mathematical Statistics I	3
Ind Eng 467	Introductory Statistics for Physical Sciences and Engineering Students	3
Math 234	(Alternative to ElecEng 234)	4
Math 467	(Equivalent to Ind Eng 467)	3

VI. Proposed Effective Date **Spring 2017**

VII. Comment

VIII. Approval

    Vice Chancellor's Signature _____

    Date _____

CEAS Faculty Resolution Concerning the Proposed Campus Budget Model

WHEREAS, the proposed campus budget model does not encourage efficiencies in the delivery of courses through cooperation between departments, schools, and colleges; and

WHEREAS, the budget model was developed prior to UWM receiving the Carnegie Classification as a "highest research activity" institution; and

WHEREAS, the budget model does not incentivize collaborative research among various units; and

WHEREAS, the budget model does not incentivize the generation of new revenues through creative initiatives by academic units; and

WHEREAS, the budget model does not account for differences in the costs associated with program delivery in units across campus; and

WHEREAS, the budget model does not incentivize strategic investments and economic growth initiatives of units; and

WHEREAS, a large percentage of tuition revenues is allocated to a subvention fund created by this model, but for which there are no defined mechanisms for using the funds for strategic investments; and

WHEREAS, the campus may be going through a major restructuring as suggested in the CCOET report.

THEREFORE, be it resolved that the implementation of the proposed campus budget model be deferred at present and that it be re-examined before future implementation with consideration of the campus environment at that time.