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, March 5, 2021 10:30 A.M. Virtually Via Microsoft Teams

A G E N D A

I. DEAN UPDATE

II. ANNOUNCEMENTS

A. 9th/10th Floor Remodeling – Andrew Graettinger

III. INFORMAL REPORTS – See Attachment 1

A. Opportunity for questions regarding Informal Reports

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

V. AUTOMATIC CONSENT BUSINESS

A. Minutes of the January 29, 2021 meeting

B. Course Changes – See Attachment 2

C. B.S. in Computer Science Program Changes – See Attachment 3

D. B.A. in Computer Science Program Changes – See Attachment 4

E. Accelerated BS/MS in Computer Science Changes – See Attachment 5

F. Change to the Minor in Materials Engineering – See Attachment 6

VI. NEW BUSINESS

A. Honors in Industrial Engineering – See Attachment 7

B. Honors in Civil Engineering – See Attachment 8

C. Honors in Environmental Engineering – See Attachment 9

D. Changes to the Applied Math and Computer Science B.S. Program – See Attachment 10

E. Changes to the B.S. in Data Science Program – See Attachment 11

VII. GENERAL DISCUSSION

VIII. ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

ATTACHMENT 1

INFORMAL REPORTS

Office of Student Services – Todd Johnson
No Report

Career Services – Juli Pickering
No Report

Curriculum Committee – Prof. Church

The Curriculum Committee passed several items that appear on this meeting's agenda. The committee also continues to work on department CIM cleanup actions.

Graduate Program Committee – Prof. Law
No Report

Academic Planning Committee – Prof. Abu-Zahra

The APC met on Feb 3rd and discussed the challenges facing our students and faculty under the current demographic and financial circumstances in Wisconsin. The committee made the following recommendation to Dean Peters:

"In the interest of streamlining CEAS majors and helping our students get the most out of their experience in CEAS, the APC recommends that an ad-hoc committee be formed to work on establishing roadmaps and implementation plans that will address the main pain-points experienced by our students and faculty such as:

1. Degree completion time, number of actual credits taken (vs. credits required), overall financial cost, etc.
2. Pre-engineering requirements (calculus, physics, and chemistry)
3. Flexibility of the curriculum (required courses vs. multidisciplinary electives)
4. Engineering (and professional) skills built in the curriculum
5. Suitability for achieved students and under-prepared students
6. Curriculum relevancy to student success ("legacy" requirements that may be no longer relevant)"

Faculty Senate – Prof. Reisel

The Faculty Senate met on January 28 and February 18. At these meetings, the Senate heard updates on the 2030+ Implementation Team work, the activities of the Division of Finance and Administrative Affairs, the activities of Development and Alumni Relations, and an Enrollment Management Report. In terms of action items that may most directly impact CEAS, the Senate passed an Academic Leave of Absence Policy for Graduate Students.

ATTACHMENT 2

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

CIV ENG 202 DYNAMICS, 3 cr., U
Kinematics and kinetics of particles and rigid bodies with applications of Newton's second law and the principles of work-energy and impulse momentum.
Prereq: Civ Eng 203(C), ~~201(P),~~ Math 233(C), Physics 209(P)

CIV ENG 303 STRENGTH OF MATERIALS, 4 cr., U
Stress and strain, torsion, bending of beams, shearing stress in beams, combined stresses, principal stresses, defections of beams, statically indeterminate members and columns. Lec & lab.
Prereq: Civ Eng 201(P) or Civ Eng 203 (P); and ~~&~~ Math 233(C).

CIV ENG 335 SOIL MECHANICS, 3 cr., U
Fundamentals of soil mechanics; soil classification; seepage analysis; principle of effective stress; stress distribution; 1-D consolidation theory; shear strength ; laboratory experience.
Prereq: jr & admis to an Eng major or grad st; Civ Eng 303(P) or Civ Eng 203 (P).

CIV ENG 401 INTERMEDIATE STRENGTH OF MATERIALS, 3 cr., U/G
Area moment, conjugate beam, deflection due to shear, bending of unsymmetrical beams, curved beams, shear flow, shear center, stresses in open sections, theories of failure, plastic stress-strain relations, plastic deformation, limit analysis, energy methods, laboratory ~~investigation.~~
Prereq: junior standing, CIV ENG 203(P) or CIV ENG 303(P).

CIV ENG 431 MATERIALS OF CONSTRUCTION, 3 cr., U/G
Investigation covering engineering properties of metals, timber, concrete, masonry, plain and reinforced plastics, glues; thermal effects.
Pre-req: jr st; Civ Eng 303(P) or Civ Eng 203(P).

CIV ENG 463 INTRODUCTION TO FINITE ELEMENTS, 3 cr. U/G
Generation and assembly of finite element matrices in one- and two-dimensional problems. Modeling and practical applications in solid mechanics, heat transfer and fluid flow. Not open to students with cr in MechEng 463, which is identical to Civ Eng 463.
Prereq: jr st; ElecEng 234(P), Civ Eng 303(P) ~~303(P), MechEng 320(C), 311(C)~~ or Civ Eng 203(P), MechEng 320(C), 311(C) or 321(C).

CIV ENG 466 MECHANICS OF COMPOSITE MATERIALS, 3 cr., U/G
Basic concepts, materials, and characteristics of composites. Micromechanics and Macromechanics of Elastic Response. Failure, design and optimization of composite structures. Civ Eng 466 & MechEng 466 are jointly offered; they count as repeats of one another.
Prereq: jr st & Civ Eng 303(P) or Civ Eng 203(P)

COMPSCI 241 C PROGRAMMING FOR EMBEDDED SYSTEMS, 3 cr., U
Problem solving with structured programming techniques, using the C programming language; Topics include using Arrays & Pointers; Memory Management; Unions, Structures; Files & Low Level IO; Process's & Inter-process Communication.
Prereq: C or better in CompSci 240(P) or CS250(P) or CS202(P)

COMPSCI 458 COMPUTER ARCHITECTURE, 3 cr., U~~/G~~
Processor organization, memory hierarchy, pipelining, computer architectures exploiting instruction/data/thread level parallelism, warehouse scale computers. ~~Processor organization and design; memory organization; microprogramming and control unit design; I-O organization; case studies of selected machine architectures.~~ Jointly offered with & counts as repeat of ElecEng 458.
Prereq: Sophomore Standing; ~~jr st; ElecEng 354(P),~~ C or better in CompSci 251(P) ~~315(P)~~ or CompSci 241(P). ~~ElecEng 367(P).~~

ELECENG 458 COMPUTER ARCHITECTURE, 3 cr., U~~/G~~
Processor organization, memory hierarchy, pipelining, computer architectures exploiting instruction/data/thread level parallelism, warehouse scale computers. ~~Processor organization and design; memory organization; microprogramming and control unit design; I-O organization; case studies of selected machine architectures.~~ Jointly offered with & counts as repeat of CompSci 458.
Prereq: Sophomore Standing; ~~jr st; ElecEng 354(P),~~ C or better in CompSci 251(P) ~~315(P)~~ or CompSci 241(P). ~~ElecEng 367(P).~~

Computer Science, BS

Summary of proposed changes or request:

1) Move the following courses from the list of "Major Requirements" to the list of "Technical Electives": CS315, EE354, CS417, CS520.
2) Reduce the "Technical Electives" credits from 15 to 9. “Supplemental Electives” category eliminated from “Technical Electives”.
3) Reduce Natural Science credits to 6

Program Curriculum (for the Catalog)

Computer Science Curriculum

The minimum number of credits required to complete the Bachelor of Science in Computer Science with a major in Computer Science is 120.

Major Requirements

COMPSCI 150	Survey of Computer Science (recommended)	3
COMPSCI 250	Introductory Computer Programming	3
COMPSCI 251	Intermediate Computer Programming	3
COMPSCI 317	Discrete Information Structures	3
COMPSCI 337	System Programming	3
COMPSCI 351	Data Structures and Algorithms	3
COMPSCI 361	Introduction to Software Engineering	3
COMPSCI 395	Social, Professional, and Ethical Issues	3
COMPSCI 431	Programming Languages Concepts	3
COMPSCI 458	Computer Architecture	3
COMPSCI 535	Algorithm Design and Analysis	3
COMPSCI 537	Introduction to Operating Systems	3
COMPSCI 594	Capstone Project Preparation	1
COMPSCI 595	Capstone Project	3
EAS 200	Professional Seminar	1

Mathematics Requirement

Select one of the following:		4-5
MATH 211	Survey in Calculus and Analytic Geometry	
MATH 213	Calculus with Life Sciences Applications	
MATH 221	Honors Calculus I	
MATH 231	Calculus and Analytic Geometry I	

Natural Science Requirement

Complete at least 6 credits of Natural Science courses from the provided list. The student must take two or more courses from this list such that at least one course has the NS+ designation (indicating a lab component) and all the courses sum up to at least 6 credits.	6

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

English Composition Requirement

Satisfied by one of the following:

- Earning a satisfactory score on the English placement test or other appropriate test, as determined by the English Department; 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

Foreign Language Requirement

The foreign language requirement can be completed with one of these options:

- Two years of a single foreign language in high school;
- Two semesters of a single foreign language in college; or

Technical Electives - Select 9 credits from the following two lists:

All non-required CompSci courses numbered 400-699 are either Computer Science or Applied Technology Electives. The Applied Technology Electives are numbered 480-489. All other non-required CompSci courses in the 400-600 range are Computer Science Electives.

Computer Science Electives

Select 3-9 credits from the following: 3-9

COMPSCI 315	Introduction to Computer Organization and Assembly Language Programming
COMPSCI 411	Machine Learning and Applications
COMPSCI 417	Introduction to the Theory of Computation
COMPSCI 422	Introduction to Artificial Intelligence
COMPSCI 423	Introduction to Natural Language Processing
COMPSCI 425	Introduction to Data Mining
COMPSCI 443	Intelligent User Interfaces and Usability Assessment
COMPSCI 444	Introduction to Text Retrieval and Its Applications in Biomedicine
COMPSCI 459	Fundamentals of Computer Graphics
COMPSCI 469	Introduction to Computer Security
COMPSCI 511	Symbolic Logic
COMPSCI 520	Computer Networks
COMPSCI 530	Computer Networks Laboratory
COMPSCI 536	Software Engineering
COMPSCI 552	Advanced Object-Oriented Programming
COMPSCI 557	Introduction to Database Systems
COMPSCI 581	Web Languages and Standards
COMPSCI 599	Senior Thesis
COMPSCI 654	Introduction to Compilers
COMPSCI 655	Compiler Implementation Laboratory
COMPSCI 657	Topics in Computer Science:
COMPSCI 699	Independent Study
ELECENG 354	Digital Logic
ELECENG 367	Introduction to Microprocessors
ELECENG 451	Introduction to VLSI Design
ELECENG 457	Digital Logic Laboratory

Applied Technology Electives

Select 0-6 credits from the following:		0-6
COMPSCI 481	Server-side Internet Programming	
COMPSCI 482	Rich Internet Applications	
COMPSCI 658	Topics in Applied Computing:	

Applied Mathematics Electives

Select 9 credits from the following:		9
IND ENG 367	Introductory Statistics for Physical Sciences and Engineering Students	
MATH 205	Introductory Finite Mathematics	
MATH 222	Honors Calculus II	
MATH 232	Calculus and Analytic Geometry II	
MATH 233	Calculus and Analytic Geometry III	
MATH 234	Linear Algebra and Differential Equations [1,2]	
ELECENG 234	Analytical Methods in Engineering [1,2]	
MATH 240	Matrices and Applications [1]	
MATH 320	Introduction to Differential Equations [2]	
MATH 305	Introduction to Mathematical and Computational Modeling	
MATH 313	Linear Programming and Optimization	
MATH 315	Mathematical Programming and Optimization	
MATH 341	Seminar: Introduction to the Language and Practice of Mathematics	
MATH 405	Mathematical Models and Applications	
MATH 431	Modern Algebra with Applications	
MATH 451	Axiomatic Geometry	
MTHSTAT 361	Introduction to Mathematical Statistics I	
MTHSTAT 469	Biostatistics	
MTHSTAT 563	Regression Analysis	

[1] Must include exactly one of MATH 240, MATH 234, ELECENG 234.

[2] May include only one of MATH 320, MATH 234, ELECENG 234.

COMPUTER SCIENCE, BA

In Workflow

1. CIM Registrar's Office (chinn@uwm.edu; ebilicki@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; dv@uwm.edu)
6. CAT Reminder (ebilicki@uwm.edu; chinn@uwm.edu; tarr@uwm.edu; nctoerpe@uwm.edu)

Approval Path

1. Mon, 04 Jan 2021 14:46:43 GMT
   Emily Kuhnen (ebilicki): Rollback to Initiator
2. Mon, 11 Jan 2021 14:45:51 GMT
   Emily Kuhnen (ebilicki): Approved for CIM Registrar's Office

History

1. Jul 31, 2020 by Todd Johnson (johnsont)

New Program Proposal

Date Submitted: Fri, 08 Jan 2021 22:28:33 GMT

Viewing: Computer Science, BA

Last approved: Fri, 31 Jul 2020 13:52:33 GMT

Last edit: Wed, 20 Jan 2021 18:29:36 GMT

Changes proposed by: mukul

Reviewer Comments

Emily Kuhnen (ebilicki) (Mon, 04 Jan 2021 14:46:43 GMT): Rollback: Please update the "Summary of proposed changes or request" field with an explanation of what is being changed.

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

No

Title of program:

Computer Science, BA

Program Level:

Undergraduate Only

Program Type:

Major

Mode of Delivery:

Face-to-Face

Department or Functional Equivalent

Units:
Computer Science

College, School, or Functional Equivalent

Units:
College of Engineering and Applied Science

College, School, or Functional Equivalent Contact Information:

Ethan Munson, Associate Dean, CEAS, munson@uwm.edu

Proposed Effective Catalog:

2020-2021

Proposed Effective Term:

Fall 2021

Minimum Credit Hours Required:

120

Summary of proposed changes or request:

Summary of new changes: 1. Replace CS315 with CS458 in the list of required CS courses. 2) Provide options to replace required courses: CS458 and CS395.

Administrative note: Admission requirements were not changed, but a missing space was added between a period and the next sentence and this has made the sentence appear to have been replaced.

Notice of Intent

The intended audience for the Notice of Intent (NOI) is UW Chancellors, Provost, and their staff members, and UWSA administration and staff. Once formally submitted to UW-System's Academic Programs and Education Innovation (APEI), the NOI becomes a public document.

The Notice of Intent should be submitted as an attachment that does not exceed three pages and includes the following information:

Information on other required approvals to offer the program beyond the BOR.
Information about content and program level
Provide a description of the new program that includes anticipated program and learning outcomes.
Existing or anticipated resources required to deliver the program.
Evidence of how the program aligns with the institutional mission, strategic plan, and existing academic degree program array.
A rationale that clearly defines the need for the new program.

NOI Attachment

noi-ba-compsci.pdf
IMPL 20Jun MIL Computer Science BA.pdf

Program Curriculum (for the Catalog)

Computer Science Curriculum

Minimum Credit Hours Required: 120

The program requires one semester of calculus (see Mathematics requirements below) and also 34 credits of major course requirements (22 credits of fixed courses and 12 credits of electives within the major). In addition, a student must either complete (or have completed) a second major, or demonstrate two minor areas of concentration. The alternate major or minor areas of concentration must overlap no more than six credits total with major course requirements of this degree. Furthermore, at least fifteen credits of the major course requirements must be completed at UW-Milwaukee.

Mathematics Requirements

Choose one of the following:

Code	Title	Credits
MATH 211	Survey in Calculus and Analytic Geometry	4
MATH 213	Calculus with Life Sciences Applications	4
MATH 221	Honors Calculus I	5
MATH 231	Calculus and Analytic Geometry I	4

Major Course Requirements

Take all of the following "Core" courses:

Code	Title	Credits
COMPSCI 150	Survey of Computer Science	3
COMPSCI 250	Introductory Computer Programming	3
COMPSCI 251	Intermediate Computer Programming	3
COMPSCI 317	Discrete Information Structures	3
COMPSCI 351	Data Structures and Algorithms	3
COMPSCI 395	Social, Professional, and Ethical Issues	3
COMPSCI 458	Computer Architecture	3
EAS 200	Professional Seminar	1
Total Credits		22

Additionally, students must take twelve elective credits of COMPSCI courses numbered 300 or higher.

COMPSCI 458 may be substituted by COMPSCI 315. COMPSCI 395 may be substituted by BUS ADM 393 or INFOST 120. EAS 200 may be substituted with a similar course. The department maintains a list of approved substitutes; this list is posted publicly. If the

substitutes are used to satisfy the second major or the minor areas, the credits substituted count against the allowable six credits of overlap.

Minor Areas of Concentration

For the purposes of this degree program, a "minor area of concentration" can be any of the following:

- An Associate's degree at UWM or another school;
- A declared UWM Minor;
- A declared UWM Certificate;
- At least fifteen credits of courses in a single curricular code (other than CompSci), of which at least six credits are at the 300-level or higher.

As described above, the two minor areas of concentration can overlap with the major course requirements by no more than six credits total.

Advancement to Major or Admission

This proposed program is housed within the College of Engineering and Applied Science (CEAS). It will follow the College's existing admission requirements which are repeated here.

Admission to the College is based on an overall assessment of both academic and non-academic qualifications. The primary review factors for admission are the strength and quality of the high school curriculum, high school class percentile, grade point average, and the result of the ACT or SAT. Well-prepared freshman applicants will have four years of mathematics (including one-and-a-half years of algebra, one year of geometry, and one-half year of trigonometry) and four years of natural science (including biology, chemistry, and physics). The College also will consider non-academic qualifications such as leadership skills, diversity in personal background, work experience, motivation, and maturity. Freshmen applicants will be considered for admission directly to the major or to the First-Year Program. Admission directly to the major is selective.

Transfer student admission is based on an overall assessment of both academic and non-academic qualifications. For transfer applicants, the primary factors considered for admission are the grade point average on transferable courses and the level of curriculum completion. The College also will consider non-academic qualifications such as leadership skills, diversity in personal background, work experience, motivation, and maturity. Transfer applicants will be considered for admission directly to the major or the Transfer Transition Program based on the number of transfer credits and GPA.

Students admitted to the First-Year Program or Transfer Transition Program (Computer Science-Intended) may apply for major status with their academic advisor at the time they believe they meet the requirements.

1. Complete first semester calculus with a C or better grade.
2. Complete GER Oral and Written Communication Part A.
3. Computer Science majors must complete CompSci 251 with a C or better grade.
4. Obtain a 3.00 GPA or a lower minimum grade point as set by the department (currently 2.50).
5. Major required courses (see below) may be repeated only once. No more than two courses may be repeated.

First-Year students have a maximum of three semesters to complete the admission to major requirements. Part-time students may be granted an extension by their academic advisor. Transfer Transition students have a maximum of two semesters to complete the admission to major requirements. Part-time students may be granted an extension by their academic advisor.

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

Continuing students
New freshmen/transfers
Reentry students
Second degree/new major students

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

Attach File

A2P 19July MIL Computer Science BA.pdf
bacs-ati.pdf

Key: 644

ATTACHMENT 5

CHANGES TO THE ACCELERATED MS DEGREE PROGRAM IN COMPUTER SCIENCE

The proposed changes can be found in yellow highlighting below.

Accelerated Master's Degree Program Description

To encourage outstanding undergraduate engineering and computer science students to continue their studies toward an advanced degree, the College of Engineering & Applied Science allows qualified students to begin their master's degree course work in their senior year. Students admitted to the Accelerated Master's Degree Program take six graduate credits as part of the BS or BA in Computer Science degree requirements.

The Accelerated Programs (formerly known as the Integrated BS-MS and the Integrated BA-MS) will have the following

Admission Requirements

- Currently enrolled in ~~the~~ an undergraduate computer science or engineering program
- 3.2 cumulative GPA or higher
- Approximately 36 credits or less remaining for BS or BA degree
- Faculty approval from the respective engineering or computer science department

MATERIALS ENGINEERING, MINOR

In Workflow

1. CIM Registrar's Office (chinn@uwm.edu; ebilicki@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; dv@uwm.edu)
6. CAT Reminder (ebilicki@uwm.edu; chinn@uwm.edu; tarr@uwm.edu; nctoerpe@uwm.edu)

Approval Path

1. Mon, 21 Oct 2019 13:53:38 GMT
   Emily Kuhnen (ebilicki): Approved for CIM Registrar's Office
2. Tue, 19 Jan 2021 19:26:16 GMT
   Todd Johnson (johnsont): Rollback to CIM Registrar's Office for CEAS Dean Programs
3. Tue, 19 Jan 2021 20:45:01 GMT
   Emily Kuhnen (ebilicki): Rollback to Initiator

History

1. Aug 18, 2018 by clmig-jwehrheim
2. Apr 18, 2019 by Emily Kuhnen (ebilicki)

Date Submitted: Tue, 19 Jan 2021 21:14:35 GMT

Viewing: Materials Engineering, Minor
Last approved: Thu, 18 Apr 2019 16:13:04 GMT
Last edit: Tue, 19 Jan 2021 21:14:32 GMT

Changes proposed by: church

Reviewer Comments

Todd Johnson (johnsont) (Tue, 19 Jan 2021 19:26:16 GMT): Rollback: By request of the department

Emily Kuhnen (ebilicki) (Tue, 19 Jan 2021 20:45:01 GMT): Rollback: Per request from B. Church

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

No

Title of program:

Materials Engineering, Minor

Program Level:

Undergraduate Only

Program Type:

Minor

Department or Functional Equivalent

Units:
Materials Science and Engineering

College, School, or Functional Equivalent

Units:
College of Engineering and Applied Science

Proposed Effective Catalog:

2021-2022

Proposed Effective Term:

Fall 2021

Minimum Credit Hours Required:

18

Summary of proposed changes or request:

Move from 9Cr of required courses and 9Cr of elective courses to 3Cr of required and 15Cr of elective (maintaining 18Cr total for the minor). The course Matleng 402 (Physical Metallurgy) is retained as a required because it contains concepts broadly considered to be critical and foundational to the Materials Engineering topic. Three additional elective courses currently offered in the Materials Engineering program are being added to the list of approved electives for the minor. This change provides greater flexibility to tailor a minor in Materials Engineering to individual goals and interests.

Program Curriculum (for the Catalog)

Requirements

The 18-credit minor requires the following:

Code	Title	Credits
Required		
MATLENG 402	Physical Metallurgy	3
Electives		
Select 5 electives (see below)		15
Total Credits		18

Electives

Code	Title	Credits
MATLENG 380	Engineering Basis for Materials Selection	3
MATLENG 410	Mechanical Behavior of Materials	3
MATLENG 411	Materials Laboratory	3
MATLENG 431	Welding Engineering	3
MATLENG 452	Ceramic Materials	3
MATLENG 453	Polymeric Materials	3
MATLENG 456	Metal Casting Engineering	3
MATLENG 457	Engineering Composites	3
MATLENG 461	Environmental Degradation of Materials	3
MATLENG 465	Friction and Wear	3
MATLENG 471	Heat Treatment of Materials	3
MATLENG 481	Electronic Materials	3
MATLENG 483	Materials for Energy Systems	3
MATLENG 511	Advanced Materials Characterization	3
MATLENG 690	Topics in Materials:	3
MATLENG 316	Thermodynamics of Materials	3
MATLENG 330	Materials and Processes in Manufacturing	3
MATLENG 460	Nanomaterials and Nanomanufacturing	3
MATLENG 385	Introduction to Biomaterials	3
MATLENG 585	Advanced Biomaterials	3

More information on the minor may be obtained from the CEAS Office of Student Services (414) 229-4667.

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

Continuing students
New freshmen/transfers
Reentry students
Second degree/new major students
Special students

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

A UW System database of majors and programs exists to serve four major system-wide electronic and paper sources of student information. Are there any keywords that can be indicated for this program on the UW System database?

Materials Engineering

Key: 221

ATTACHMENT 7

HONORS PROGRAM IN IDUSTRIAL AND MANUCTURING ENGINEERING

Students in the Industrial and Manufacturing Engineering Department who meet the following criteria can be awarded honors in the major upon graduation:

I A 3.000 cumulative GPA in all UWM graded credits.

II A 3.500 GPA over all upper-division (300 level and higher) industrial engineering courses; and

III. At least one of the followings:

a. Participation in accelerated MS program with successful completion of 6 credits in approved courses for the IME program.

b. Successful completion of 3-cr faculty supervised research experience or a score of A- or A in the team-based capstone project (IND ENG 485).

ATTACHMENT 8

HONORS IN CIVIL ENGINEERING MAJOR

Students in the Civil and Environmental Engineering Department who meet all the following criteria can be awarded honors in the major upon graduation:

I A 3.000 cumulative GPA in all UWM graded credits;

II A 3.500 GPA over all upper-division (300 level and higher) Civ Eng courses; and

III. Participation in Accelerated Master's (Integrated BS-MS) Degree program with successful completion of 6 credits at the undergraduate level that can apply towards the MS degree program.

ATTACHMENT 9

HONORS IN ENVIRONMENTAL ENGINEERING MAJOR

Students in the Civil and Environmental Engineering Department who meet all the following criteria can be awarded honors in the major upon graduation:

I A 3.000 cumulative GPA in all UWM graded credits;

II A 3.500 GPA over all upper-division (300 level and higher) Civ Eng courses; and

III. Participation in Accelerated Master's (Integrated BS-MS) Degree program with successful completion of 6 credits at the undergraduate level that can apply towards the MS degree program.

ATTACHMENT 10

CHANGES TO THE APPLIED MATHEMATICS AND COMPUTER SCIENCE B.S. PROGRAM

Proposed Effective Term:
Fall 2021

Summary of proposed changes or request:
The original purpose of the AMCS degree was to serve as a double major in Math and Comp Sci. Thus the number of upper division credits in Math and Comp Sci required is quite large. Now that there is a flexible BA in Computer Science, students can double major in Comp Sci and Math, lessening the need for this program. We propose to simplify the program by removing a few of the required upper div credits – so instead of a hefty double major, it is more of an integrated math and comp sci major. It still contains more CS than a Math major + CS minor, and more math than a CS major + math minor. For comparison purposes, it requires the same number of Math/CS credits as the recently adopted BS in Data Science.
{Specifically,
The current AMCS # cr in Math/CS is 76, = the same # cr as a BA in CS + math as a second major. The proposed AMCS # cr in Math/CS is 64, same as the BS in DS.}

Program Curriculum (for the Catalog)

(a) Applied Math and Computer Science Major Requirements

Students who intend to complete the program in four years will need to begin taking mathematics in their first semester. Such students should have a University of Wisconsin-Milwaukee mathematics placement level of 30 (ready for precalculus) or better.

Admission

As soon as students realize their interest in the AMCS degree, they should consult with an AMCS advisor either in College of Engineering and Applied Science or College of Letters and Science, who assists in planning a program. Admission to the program requires a GPA of at least 2.500 in 8 credits of mathematics courses at or above the 200 level and 6 credits of computer science courses at or above the 200 level.

Degree Requirements

For the BS (AMCS) degree, 120 credits are required, of which ~~75~~ 60 must be taken from the College of Letters and Science. Students must satisfy the general education requirements (GER) of the University. Students must take at least 8 credits of natural sciences outside of mathematics or mathematical statistics.

An overall GPA of 2.000 on all coursework attempted at UWM is required for this degree. In addition, students must achieve a 2.000 GPA on all coursework attempted, including transfer work. A minimum 2.000 GPA must be earned on all 300-level and above courses taken to satisfy the advanced requirements. Students satisfy the residency requirement for the degree by completing at UWM both a minimum of 15 credits of the required advanced courses and one of the following:

- The last 30 credits;
- 45 of the last 60 credits;
- Any 90 credits.

Course List

Code	Title	Credits
Core Requirements		
COMPSCI 250	Introductory Computer Programming	3
COMPSCI 251	Intermediate Computer Programming	3
COMPSCI 315	Introduction to Computer Organization and Assembly Language Programming	3
COMPSCI 317	Discrete Information Structures [1]	3
Select the following (or an equivalent sequence):		12
MATH 231	Calculus and Analytic Geometry I	
MATH 232	Calculus and Analytic Geometry II	
MATH 233	Calculus and Analytic Geometry III	
MATH 234	Linear Algebra and Differential Equations	4
or MATH 240	Matrices and Applications	
MATH 341	Seminar: Introduction to the Language and Practice of Mathematics	3
Advanced Requirements		
COMPSCI 351	Data Structures and Algorithms	3
COMPSCI 535	Algorithm Design and Analysis	3
Select ~~9~~6 credits in COMPSCI at the 300 level or above ***NOTE: OR REMOVE CS 315 and leave 9 cr CS 300+ electives, whichever CS approves***		~~9~~ 6
Select ~~6~~12 credits from MATH and/or MTHSTAT and/or ACTSCI at the 300 level or above		~~6~~ 12
~~Select one of the following pairs:~~		~~6~~
~~MATH 305 & MATH 405~~	~~Introduction to Mathematical and Computational Modeling and Mathematical Models and Applications~~	
~~MATH 313 & MATH 315~~	~~Linear Programming and Optimization and Mathematical Programming and Optimization~~	
~~MATH 320 & MATH 322~~	~~Introduction to Differential Equations and Introduction to Partial Differential Equations~~	
~~MATH 413 & MATH 415~~	~~Introduction to Numerical Analysis and Introduction to Scientific Computing~~	
~~MATH 413 & MATH 417~~	~~Introduction to Numerical Analysis and Computational Linear Algebra~~	
~~MATH 415 & MATH 417~~	~~Introduction to Scientific Computing and Computational Linear Algebra~~	
~~MATH 431 & MATH 531~~	~~Modern Algebra with Applications and Modern Algebra~~	
~~MATH 521 & MATH 522~~	~~Advanced Calculus I and Advanced Calculus II~~	
~~MATH 531 & MATH 535~~	~~Modern Algebra and Linear Algebra~~	

Course List

Code	Title	Credits
~~MATH 601~~	~~Advanced Engineering Mathematics I~~	
~~& MATH 602~~	~~and Advanced Engineering Mathematics II~~	
~~MATH 621~~	~~Introduction to Analysis I~~	
~~& MATH 622~~	~~and Introduction to Analysis II~~	
~~MATH 631~~	~~Modern Algebra I~~	
~~& MATH 632~~	~~and Modern Algebra II~~	
~~MTHSTAT 361~~	~~Introduction to Mathematical Statistics I~~	
~~& MTHSTAT 362~~	~~and Introduction to Mathematical Statistics II~~	
~~MTHSTAT 361~~	~~Introduction to Mathematical Statistics I~~	
~~& MATH 571~~	~~and Introduction to Probability Models~~	
Select ~~21~~ 9 additional credits from CompSci, Math, MthStat, and ActSci courses at the 300 level or above, beyond the “Core” as well as the above “Advanced” Requirements		~~21~~ 9
Total Credits		~~79~~ 64

Included in courses above, students must also complete a Capstone Experience (select one of the options below)

Math or MthStat 489
Math 575 or 599
Comp Sci 594, 595, or 599

[1] COMPSCI 317 is waived for students who earn credit for MTHSTAT 361, which counts towards the math electives for the program. Students who have COMPSCI 317 waived in this case do not need to take any additional credits.

Additional Requirements

- **Students completing a Data Science BS who wish to also earn an AMCS BS must complete 9 credits upper division ActSci/Math/MthStat/CompSci beyond the courses in those curr areas used to fulfill the Data Science Major requirements.**

ATTACHMENT 11

CHANGES TO THE B.S. IN DATA SCIENCE PROGRAM

Proposed Effective Term:
Fall 2021

Changes related to the BS in Data Science

Rationale: The goal for both is to make sure 315 is not required by any of our affiliated programs and to allow 341 as substitute for 317 (which is not otherwise required for math students who might consider the BSDS.

1. Update the prereq of 422 (Artificial Intelligence) to " CS 351, and either CS 317 or both of Math 341 and MthStat 361"
2. Replace the "CS 315" requirement in the BSDS with "CS 317 or Math 341".