December 10, 2021
No. 368

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, December 10, 2021 10:30 A.M. Virtually by Microsoft Teams

M I N U T E S

The meeting was called to order at 10:30 a.m. with Dean Brett Peters presiding.

PRESENT: Professors Abu-Zahra, Amano, Avdeev, Boyland, Chang, Cheng, Church, Dabagh, D'Souza, El-Hajjar, Helwany, Hu, Jang, Kate, Kouklin, Law, Li, Liao, Ma, Mali, McRoy, Misra, Munson, Niu, Nosonovsky, Otieno, Peters, Pillai, Premnath, Qin, Qu, A.Rahman, M.Rahman, Rammer, Reisel, Rohatgi, Salowitz, Seifoddini, Sobolev, Tabatabai, Titi, L.Wang, W.Wang, Y.Wang, Z.Yu, J.Zhao, T.Zhao

EXCUSED: Professor Venugopalan

I. DEAN UPDATE

The 2030+ teams continue to work on campus changes. Several models for GER have been proposed, and the GER reform team continues to work towards making a recommendation on the future format and management of GER at UWM. The school/college realignment model is being readied for Faculty Senate approval. If approved, 4 colleges will be created from eight existing schools and colleges, and the Graduate School will be recombined with the Office of Research. These, and other actions, will require modifications to the UWM budget model.

CEAS has been required to reduce FY22 spending by $1.1 million, and most of this has been achieved through vacant faculty lines and greatly reduced travel expenses. CEAS has been informed that it should plan for a 1.75% permanent base budget reduction in FY23, and that this is tied for the largest reduction percentage among the academic units on campus.

CEAS has been given authority to hire new faculty, and it is expected that 6-10 new faculty will be hired. Most of these will be at the assistant professor level, but there are possibilities for senior hires as well.

CEAS will be awarding some named professorships and faculty fellowships, with 4-6 expected.

The HVAC retrofit and upgrade in the EMS building is underway, as is the remodeling of the 9th and 10th floors. Preliminary design work on the new building, which is expected to be split roughly 2/3 to Psychology and 1/3 to CEAS, is complete. The new building project would also include substantial remodeling in EMS on the 1st and 2nd floors, and possibly the third floor. Funding for construction of the building will be sought in the FY 23-25 budget.

II. ANNOUNCEMENTS

The Order of the Engineer ceremony will be on Saturday, December 18, and will be in-person.

III. INFORMAL REPORTS – See Attachment 1

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

As 47 voting faculty members were present, a quorum was present.

V. AUTOMATIC CONSENT BUSINESS

A. Minutes of the October 1, 2021 Meeting

B. New Courses, Course Changes, and Course Discontinuations – See Attachment 2

C. Graduation

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

Prof. A. Rahman requested that the B.S. in Biomedical Engineering Program Changes be removed from Automatic Consent. It was considered under Item B of New Business.

VI. NEW BUSINESS

A. Discussion of a Potential B.S. in Engineering Program

Associate Dean Munson made a presentation on the potential B.S. in Engineering Program. The program would target students who currently graduate from 2-year technology programs, primarily at Wisconsin Technological College System schools. The program would provide a 2-year path to an engineering degree for those students who had graduated from a CEAS-related Associate's Degree program.

B. B.S. in Biomedical Engineering Program Changes – See Attachment 3

Prof. J. Zhao moved to approve the B.S. in Biomedical Engineering program changes.

After substantial discussion, Prof. A Rahman moved to refer the proposed B.S. in Biomedical Engineering Program Changes to the Curriculum Committee for consideration of the issues raised in the discussion, and that the Curriculum Committee should invite all interested parties to the meeting where the program will be discussed. The motion was seconded, and passed on a ballot vote 25-8.

VII. GENERAL DISCUSSION - None

VIII. ADJOURNMENT

Meeting Adjourned at 12:08 p.m.

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

Business items found in the Automatic Consent portion of the meeting were discussed and approved by the committee.

Graduate Program Committee – Prof. Law

No Report

Academic Planning Committee – Prof. Petering

No Report

Faculty Senate – Prof. Reisel

In its October meeting, the Faculty Senate heard an overview of the work of the 2030 Action Teams. In its November meeting, the Faculty Senate heard updates on School/College restructuring at UWM.

ATTACHMENT 2

NEW COURSES

BME 296 FUNDAMENTALS OF BIOMATERIALS, 4 cr., U
Fundamentals of biomaterials including ceramics, metals, polymers, and natural biomaterials; Biological responses to implants; clinical perspectives; designing new biomaterials; tissue engineering. Laboratory experiments.
Prereq: Bio Sci 203 (P)

BME 306 INTRODUCTION TO ENGINEERING BIOMECHANICS, 4 cr., U
Introduction to engineering biomechanics principles applied to the musculoskeletal system and human body for analysis of human movement, Laboratory experiments.
Prereq: BioSci 203 (P), BME 302 (P)

EAS 110 FUNDAMENTALS OF SMART SYSTEMS ENGINEERING I, 2 cr., U
Electrical sources, resistance, Kirchhoff's laws, Resistive sensors, application, introduction to robotics, laboratory experiments and projects.
Prereq: Math 115 (C)

EAS 210 FUNDAMENTALS OF SMART SYSTEMS ENGINEERING II, 2 cr., U
Electrical capacitance, inductance, simple circuit application, diodes, opamps, digital logic, microcontroller basics, laboratory experiments and projects.
Prereq: EAS 110 (P)

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

BME 101 FUNDAMENTALS OF BIOMEDICAL ENGINEERING, 3 cr., U
A system approach to physiology, cell physiology and transport, major organ systems, cardiovascular system, biomedical signal processing, biomechanics, biomedical engineering design.
Prereq: Math 115 (C) ~~Math 221 (C) or Math 231 (C)~~

DISCONTINUED COURSES

EAS 121 AUTOMATION: CONTROLS AND SENSORS

EAS 122 MOTION CONTROL AND SAFETY

ATTACHMENT 3

B.S. in Biomedical Engineering Program Change

The revised B.S. in Biomedical Engineering curriculum can be found on the following pages.

Biomedical Engineering, BSE

Biomedical Engineering Curriculum

The minimum number of credits required to complete the Bachelor of Science in Biomedical Engineering is 120.

Course List

Code	Title	Credits
Engineering Core - ~~24~~ credits 26 credits		
BME 101	Fundamentals of Biomedical Engineering	3
EAS 200	Professional Seminar	1
~~CIV ENG 203~~	~~Introduction to Solid Mechanics~~	~~4~~
~~ELECENG 301~~	~~Electrical Circuits I~~	~~3~~
~~ELECENG 305~~	~~Electrical Circuits II~~	~~4~~
~~MATLENG 201~~	~~Engineering Materials~~	~~4~~
~~MECHENG 101~~	~~Computational Tools for Engineers~~	~~2~~
~~MECHENG 301~~	~~Basic Engineering Thermodynamics~~	~~3~~
EAS 110	Fundamentals of Smart Systems Engineering I	2
EAS 210	Fundamentals of Smart Systems Engineering II	2
CompSci 202 or 250	Introductory Programming Using Python or Introductory Computer Programming	3
	Any combination of 200 or higher-level courses from BME, CIV ENG, ELEC ENG, EAS, IND ENG, MATLENG, MECHENG; at least 9 of these credits must be from 300 or higher-level courses.	15
Major Requirements - ~~38~~ 40 credits		
BIO SCI 202	Anatomy and Physiology I	4
BIO SCI 203	Anatomy and Physiology II	4
KIN 270	Statistics in the Health Professions: Theory and Practice	3
BME ~~301~~ 296	Fundamentals of Biomaterials	~~3~~ 4
BME 302	Analysis and Modeling of Dynamic Systems	4
BME ~~305~~ 306	Introduction to Engineering Biomechanics	~~3~~ 4
BME 310	Biomedical Signals and Systems	3
BME 320	Engineering of Biomedical Devices I	4
BME 325	Engineering of Biomedical Devices II	3
BME 495	Biomedical Instrumentation Laboratory	3
BME 595	Capstone Design Project	4

Course List

Code	Title	Credits
Mathematics Requirement - 16 credits [1]		
MATH 231	Calculus and Analytic Geometry I	4
MATH 232	Calculus and Analytic Geometry II	4
MATH 233	Calculus and Analytic Geometry III	4
ELECENG 234	Analytical Methods in Engineering	4
Physics Requirement - ~~10~~ 8 credits		
PHYSICS 209	Physics I (Calculus Treatment)	
~~& PHYSICS 214~~	~~and Lab Physics I (Calculus Treatment)~~	~~5~~ 4
PHYSICS 210	Physics II (Calculus Treatment)	
~~& PHYSICS 215~~	~~and Lab Physics II (Calculus Treatment)~~	~~5~~ 4
Technical Electives – ~~11~~ 9 credits		
Select ~~11~~ 9 credits from the approved technical electives list below: [2]		~~11~~ 9
BIO SCI 150	Foundations of Biological Sciences I	
BIO SCI 152	Foundations of Biological Sciences II	
BME 585	Advanced Biomaterials	
BME 599	Senior Thesis	
BME 690	Topics in Biomedical Engineering:	
BME 699	Independent Study	
BUS ADM 447	Entrepreneurship	
CHEM 102	General Chemistry	
CHEM 104	General Chemistry and Qualitative Analysis	
CHEM 343	Organic Chemistry	
CHEM 344	Organic Chemistry Laboratory	
CHEM 345	Organic Chemistry	
CIV ENG 311	Introduction to Energy, Environment and Sustainability	
COMPSCI 250	Introductory Computer Programming	
COMPSCI 411	Machine Learning and Applications	
EAS 1	Engineering Co-op Work Period	
EAS 497	Study Abroad:	
ELECENG 361	Electromagnetic Fields	
ELECENG 410	Digital Signal Processing	
ELECENG 436	Introduction to Medical Instrumentation	
ELECENG 437	Introduction to Biomedical Imaging	
IND ENG 360	Engineering Economic Analysis	
MECHENG 320	Introduction to Fluid Mechanics	

Course List

Code	Title	Credits
MECHENG 474	Introduction to Control Systems	
GER Distribution Requirement - 15 credits		
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		6
Students must also satisfy Oral and Written Communication (OWA) Part A [3]		0-6
Students must also Satisfy the UWM Foreign Language requirements (0-8) [3]		0-8
Total Credits		120

[1] MATH 221 and MATH 222 may substitute for MATH 231, MATH 232, and MATH 233.

[2] The following courses are approved technical electives, but are currently inactive: ELECENG 437, ELECENG 438, ELECENG 539.

[3] See General Education Requirements.