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, February 23, 2018   1:30 P.M.   EMS E180

A G E N D A

I.   ANNOUNCEMENTS

    A. Active Shooter Training

II.   INFORMAL REPORTS – See Attachment 1

    A. Opportunity for questions regarding Informal Reports

III.   AUTOMATIC CONSENT BUSINESS

    A.   New Course and Course Changes – See Attachment 2

    B. BME Program Modification – See Attachment 3

    C. Computer Engineering B.S. Program Modification – See Attachment 4

    D. Web Development Certificate Program Modification – See Attachment 5

IV.   NEW BUSINESS

    A. CEAS Awards and Recognition Committee Charter – See Attachment 6

    B. Resolution on TA Position Appointments – See Attachment 7

V.   GENERAL GOOD AND WELFARE

VI.   ADJOURNMENT

John R. Reisel, Secretary
CEAS Faculty

JRR
Attachments

INFORMAL REPORTS

Office of Student Services – Todd Johnson
No Report

Career Services – Juli Pickering
No Report

Curriculum Committee – Prof. Church
The Curriculum Committee is considering first-year engineering course content that is approachable for students at the pre-calculus level. A major goal is to enhance early engineering experiences and to better engage students that currently have few options beyond math, sciences, and general education courses. This is at an initial stage where we are collecting ideas with a general goal of infusing these topics in either existing or new 100-level CEAS courses. If you have ideas about activities, topics, or course content that is applicable/valuable to pre-calc engineering students from all CEAS majors, please contact the Curriculum Committee member from your program or the committee chair, Ben Church.

Graduate Program Subcommittee – Prof. Liao
No Report

Academic Planning Committee – Prof. Misra
APC met three times since last informal report and the following is a summary of actions.
• Drafted a formula to address the CEAS faculty salary compression issue and recommended to Dean Peters for its implementation in 2018 year.
• Advised Dean Peters for implementation of an annual assessment of each department following a format that the committee formulated.
• CEAS faculty committee charters and the committee structure were reviewed. Committee chairs have been contacted for further actions.
• Discussed the UG engineering core courses and potential opportunities. It was decided to continue discussions with the Curriculum Committee and departments/ programs.
• Plans to hold a faculty retreat to identify potential multidisciplinary research area(s) and the faculty teams for the CEAS to invest on to attract large/ multimillion Dollar projects.

Biomedical and Health Informatics – Prof. McRoy
No Report

Faculty Senate – Prof. Boyland
No Report

NEW COURSE

BME 305	INTRODUCTION TO BIOMECHANICS, 3 cr., U
	Introduction to biomechanics principles applied to the musculoskeletal system and human body for analysis of human movement.
	Prereq: BioSci 203 (P), BME 302 (P)

COURSE CHANGES

BME 320	ENGINEERING OF BIOMEDICAL DEVICES I, 4 cr., U
	Physiological and biomechatronic systems, sensors and actuators, signal processing, hearing aid and implants. Laboratory experiments sessions included.
	Prereq: jr st, BME 101 (P) and BME 302 (P).

had been

BME 320	ENGINEERING OF BIOMEDICAL DEVICES I, 3 cr., U
	Physiological and biomechatronic systems, sensors and actuators, signal processing, hearing aid and implants.
	Prereq: jr st, BME 101(P), ElecEng 234(P), MechEng 101(C), Physics 210(P)

COMPSCI 537	INTRODUCTION TO OPERATING SYSTEMS, 3 cr, U/G
	Process management including process creation, switching, multithreading, scheduling, communication and concurrency control; memory management including paging, segmentation and virtual memory; Systems programming.
	Prereq: jr st; CompSci 458(C) or ElecEng 458(C); CompSci 337(P).

had been

COMPSCI 537	INTRODUCTION TO OPERATING SYSTEMS, 3 cr, U/G
	Process management including scheduling, concurrency, synchronization, and deadlock; memory management, I/O management and disk scheduling, file systems. Systems programming.
	Prereq: jr st; CompSci 458(P) or ElecEng 458(P); CompSci 337(P).

COMPSCI 595	CAPSTONE PROJECT, 4 cr., U
	Students will integrate their knowledge of the undergraduate computer science curriculum by implementing a significant computer science team project.
	Prereq: sr st, CompSci 351 (P), CompSci 361 (P), and credit in at least 6 credits of 400 or higher CompSci courses.

had been

COMPSCI 595   CAPSTONE PROJECT, 4 cr., U
Students will integrate their knowledge of the undergraduate computer science curriculum by implementing a significant computer science team project.
Prereq: sr st, CompSci 361(P), 458(C), 535(C), 537(C).

REVISIONS TO BIOMEDICAL ENGINEERING CURRICULUM

The following two pages contain the revised BME curriculum, with changes highlighted. The next two pages contain the currently-approved BME curriculum.

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

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Biomedical Engineering is **120** credits. Students who need background preparation courses may need additional credits. See information below regarding placement examinations.

Engineering Core Courses (26 credits)		Credits	Prerequisite
BME 101	Fundamentals of Biomedical Engineering	3	MechEng 101 (C)
Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233(C)
EAS 200	Professional Seminar	1	None
ElecEng 301	Electrical Circuits I	3	Physics 210(C)
ElecEng 305	Electrical Circuits II	4	ElecEng 234, 301
MatlEng 201	Engineering Materials	4	Math 231 (C), Chem 100* or score 1 on chem placement test
MechEng 101	Computational Tools for Engineers	2	Math 221(C) or 231(C)
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209

^Biomedical Engineering Major (38 credits)			
Bio Sci 202	Anatomy & Physiology I	4	None
Bio Sci 203	Anatomy & Physiology II	4	Bio Sci 202* or 315*
Bio Sci 465	Biostatistics	3	Jr St, Bio Sci 150, Math 105
or			
IndEng 467	Intro. Statistics for Physical Science & Engineering Students	3	Jr St, Math 233
BME 302	Analysis and Modeling of Dynamic Systems	4	MechEng 101 (P), ElecEng 234 (P), Physics 210 (P)
BME 305	Introduction to Biomechanics	3	BioSci 203 (P), BME 302 (P)
BME 320	Engineering of Biomedical Devices I	4	BME 101(P), BME 302(P)
BME 325	Engineering of Biomedical Devices II	3	BioSci 203(P), BME 320(P)
BME 385	Introduction to Biomaterials	3	Jr St, MatEng 201
BME 495	Biomedical Instrumentation Lab/Senior Lab	3	BME 325, MechEng 479 (C) or BME 305(P)
BME 595	Capstone Design Project	4	BME 495
ElecEng 310	Signals & Systems	3	ElecEng 305(C)

^^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 at least "C" grade.
Or Math 221- 222 (Honors)		10	
And ElecEng 234	Analytical Methods in Engineering	4	Math 232*

Physics (10 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)

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
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 a minimum of 24 credits required for major (Excludes: general education, prerequisite and orientation courses). 2. Complete Math 232 (or 222) with a "C" or better grade. 3. Complete EAS 200 Professional Seminar. 4. Complete the English composition requirement. 5. Obtain a 2.0 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 2018

Technical Electives – Biomedical Engineering Major

The Biomedical Engineering program requires a total of 15 credits of technical electives, chosen from the following list:

All non-required Biomedical Engineering courses numbered 400-699 are Technical Electives.

Bio Sci 150	Foundations of Biological Sciences I	4	Chem 100 or 102 or Conc Reg
Bio Sci 152	Foundations of Biological Sciences II	4	C- or better in Bio Sci 150
Bio Sci 354	Introduction to Neuroscience I	3	Bio Sci 315* or Psych 254*
Bio Sci 355	Introduction to Neuroscience II	3	Bio Sci 152, 315(C), or Psych 254
BME 585	Advanced Biomaterials	3	Sr St or G
BME 599	Senior Thesis	1-3	Sr St, cons instr.
BME 690	Topics in Biomedical Engineering may be taken with change in topic to 9 cr		Jr St
BME 699	Independent Study may be taken to 6 cr max	1-3 cr	Jr St, cons instr & CEAS Assoc Dean
BusAdm 447	Entrepreneurship	3	Jr St, BusAdm 350
Chem 102	General Chemistry	5	Chemistry Plmt or Chem 100*; Math Plmt or Math 105*
Chem 104	General Chemistry & Quantitative Analysis	5	Chem 102*
Chem 343	Organic Chemistry	3	Chem 104*
Chem 344	Organic Chemistry Laboratory	2	Chem 343*, 345(C)(R)
Chem 345	Organic Chemistry	3	Chem 343*, Chem 344(C)
Civ Eng 303	Strength of Materials	4	Civ Eng 201, Math 233(C)
CompSci 250	Introductory Computer Programming	3	Math 116 or 211
EAS 001	Co-op Work Period	3	Prior Cons Co-Op Dir
EAS 497	Study Abroad	3	Acceptance to Study Abroad Program
ElecEng 361	Electromagnetic Fields	3	ElecEng 234, Math 233*, Physics 210
ElecEng 410	Principles of Discrete Systems & Digital Signal Processing	3	Jr St, ElecEng310
ElecEng 436	Introduction of Medical Instrumentation	3	Jr St, ElecEng 305
ElecEng 437	Introduction to Biomedical Imaging	3	Sr St, ElecEng 310
ElecEng 438	Bioanalytics & Biomedical Diagnostics	3	Sr St, ElecEng 310, 330
ElecEng 537	Fundamentals of Neuroimaging Technology	3	Sr St, ElecEng 437
ElecEng 539	Introduction to Magnetic Resonance Imaging	3	Jr St, ElecEng 310 and 361
Ind Eng 360	Engineering Economic Analysis	3	Jr St
Ind Eng 584	Biodynamics of Human Motion	3	Jr St, Civ Eng 202(C), ElecEng 234
MechEng 320	Introduction to Fluid Mechanics	3	Civ Eng 202, ElecEng 234, MechEng 301(C)
MechEng 370	Computer Aided Engineering Laboratory	2	Civ Eng 202, 303, ElecEng 234, MechEng 101, 111
Mech Eng 474	Introduction to Control Systems	4	Sr St, Civ Eng 202*, Elec Eng 234*, 301
OccThpy 593	Introduction to Biomedical and Rehabilitation Instrumentation	3	Jr St or Cons Instr
OccThpy 620	Introduction to Assistive and Rehabilitation Technology	3	OccThpy 401(P) or Cons Instr
OccThpy 625	Design and Disability	3	Jr St or Cons Instr
Physics 305	Medical Physics	3	B+ or better in Physics 209; Physics 210(C) strongly recommended
Physics 306	Introduction to Biophysics	3	Chem 104 or 105, Physics 122 or 201
Psych 254	Physiological Psychology	3	Psych 101

Pre-Medicine Suggested Courses: Students considering medical school should consult with the pre-medical advisor early in their undergraduate career for help in planning a program. The courses listed below are suggested for pre-medical students.

Science Courses			
Bio Sci 150	Foundations of Biological Sciences I	4	(Technical Elective for BME)
Bio Sci 152	Foundations of Biological Sciences II	4	(Technical Elective for BME)
One Advanced course in Bio Sci with lab		5	
Chem 102	General Chemistry	5	(Technical Elective for BME)
Chem 104	General Chemistry & Quantitative Analysis	5	(Technical Elective for BME)
Chem 343	Organic Chemistry	3	(Technical Elective for BME)
Chem 344	Organic Chemistry Laboratory	2	(Technical Elective for BME)
Chem 345	Organic Chemistry	3	(Technical Elective for BME)
Chem 501	Introduction to Biochemistry	3	
Math – a semester of calculus		4	(Required for BME)
Physics 209	General Physics I	4	(Required for BME)
Physics 210	General Physics II	4	(Required for BME)
Physics 214	Lab Physics I	1	(Required for BME)
Physics 215	Lab Physics II	1	(Required for BME)
Statistics – Any statistics course		3	(Required for BME)
General Education Courses			
Psych 101	Introduction to Psychology	3	(UWM Social Science GER)
Sociol 101	Introduction to Sociology	3	(UWM Social Science GER)
PH 101	Introduction to Public Health	3	(UWM Social Science GER)

*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 Biomedical Engineering must maintain an average GPA of at least 2.0 in all 300-level required major courses. Transferable courses will be included as appropriate. Advancement to major status is required for graduation.

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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 Biomedical Engineering (414) 229-4768
Engineering & Mathematical Science Building (EMS) Room 503

Web Site: www.ceas.uwm.edu

Effective Fall 2018

University of Wisconsin – Milwaukee
College of Engineering and Applied Science
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Engineering Core Courses (26 credits)

		Credits	Prerequisite
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Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233(C)
EAS 200	Professional Seminar	1	None
ElecEng 301	Electrical Circuits I	3	Physics 210(C)
ElecEng 305	Electrical Circuits II	4	ElecEng 234, 301
MatlEng 201	Engineering Materials	4	Math 231 (C), Chem 100* or score 1 on chem placement test
MechEng 101	Computational Tools for Engineers	2	Math 221(C) or 231(C)
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209

^Biomedical Engineering Major (37 credits)

		Credits	Prerequisite
Bio Sci 202	Anatomy & Physiology I	4	None
Bio Sci 203	Anatomy & Physiology II	4	Bio Sci 202* or 315*
Bio Sci 465	Biostatistics	3	Jr St, Bio Sci 150, Math 105
or			
IndEng 467	Intro. Statistics for Physical Science & Engineering Students	3	Jr St, Math 233
BME 320	Engineering of Biomedical Devices I	3	BME 101(P), ElecEng 234(P), Physics 210(P)
BME 325	Engineering of Biomedical Devices II	3	BioSci 203(P), BME 320(P)
BME 385	Introduction to Biomaterials	3	Jr St, MatEng 201
BME 495	Biomedical Instrumentation Lab/Senior Lab	3	Bio Sci 203, BME 101, ElecEng 301, 436, MechEng 479 (C)
BME 595	Capstone Design Project	4	BME 495
ElecEng 310	Signals & Systems	3	ElecEng 305(C)
MechEng 469	Introduction to Biomechanical Engineering	3	Civ Eng 202,303
Mech Eng 474	Introduction to Control Systems	4	Sr St, Civ Eng 202*, Elec Eng 234*, 301

^^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*

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	
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Effective Fall 2016

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BusAdm 447	Entrepreneurship	3	Jr St, BusAdm 350
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Chem 104	General Chemistry & Quantitative Analysis	5	Chem 102*
Chem 343	Organic Chemistry	3	Chem 104*
Chem 344	Organic Chemistry Laboratory	2	Chem 343*, 345(C)(R)
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ElecEng 436	Introduction of Medical Instrumentation	3	Jr St, ElecEng 305
ElecEng 437	Introduction to Biomedical Imaging	3	Sr St, ElecEng 310
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ElecEng 539	Introduction to Magnetic Resonance Imaging	3	Jr St, ElecEng 310 and 361
Ind Eng 360	Engineering Economic Analysis	3	Jr St
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Physics 215	Lab Physics II	1	(Required for BME)
Statistics – Any statistics course		3	(Required for BME)
General Education Courses			
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Sociol 101	Introduction to Sociology	3	(UWM Social Science GER)
PH 101	Introduction to Public Health	3	(UWM Social Science GER)

*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 Biomedical Engineering must maintain an average GPA of at least 2.0 in all 300-level required major courses. Transferable courses will be included as appropriate. Advancement to major status is required for graduation.

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Effective Fall 2016

Action **CHANGE**
Major **Computer Engineering**

UW-MILWAUKEE ONLINE PROGRAM CHANGE FORM

I. Current

Chemistry Requirement: 5 credits suggested**
One of the following Chemistry sequences must be completed:

Chem 105 (5 credits suggested)
or
Chem 102-104 (10 credits)

II. Proposed Change Summary

permit biology to substitute for chemistry

III. Effects

Additional Faculty Required

Four-Year Faculty Needs

Library Resources

Required Additional Facilities and Equipment

Program Costs

Resource Reallocation

IV. Justification

**Biology is now just as useful for Computer Engineers as
Chemistry**

V. New Copy

Chemistry or Biology Requirement: 4-5 credits
Choose one of the following courses:

Chem 105 (5 cr.), Chem 102 (5 cr.), BioSci 150 (4 cr.), or BioSci

202 (4 cr.)

VI. Proposed Effective Date **Fall 2018**

VII. Comment

VIII. Approval

    Vice Chancellor's Signature _____
    Date _____

Action **CHANGE**
Certificate **Web Development Certificate**
Level of Certificate **Undergraduate Only**
New Level of Certificate **Same**

UW-MILWAUKEE ONLINE PROGRAM CHANGE FORM

I. Current

Web Development Certificate. The Web Development Certificate is designed to offer students the opportunity to complement their major field of study with an additional concentration in web programming. This certificate is also available to those who have already graduated. The 18-credit certificate requires one course selected from CompSci 202 and CompSci 351; one course selected from CompSci 113, InfoSt 320, and ART 325; one course selected from CompSci 361 and CompSci 481; and CompSci 482. The remaining 6 credits are selected from Art 218, 224, 325, BusAdm 531, 532, Commun 313, 413, CompSci 112, 425, 444, 552, CurrIns 530, 547, English 439, HCA 444, 542, INFOST 325, 370, 430. At least 8 credits must be completed at UWM. The student must maintain a minimum GPA, as specified by department, in courses used to complete the certificate.

II. Proposed Change Summary

Courses added to reflect program changes, InfoSt 430 removed at the department's request.

III. Effects

Additional Faculty Required

Four-Year Faculty Needs

Library Resources

Required Additional Facilities and Equipment

Program Costs

Resource Reallocation

IV. Justification

Changes in the certificate reflect changes in the CompSci

and InfoSt programs.

V. New Copy

Web Development Certificate. The Web Development Certificate is designed to offer students the opportunity to complement their major field of study with an additional concentration in web programming. This certificate is also available to those who have already graduated. The 18-credit certificate requires one course selected from CompSci 202 and CompSci 351; one course selected from CompSci 113, InfoSt 320, and ART 325; one course selected from CompSci 361 and CompSci 481; and CompSci 482. The remaining 6 credits are selected from Art 218, 224, 325, BusAdm 531, 532, Commun 313, 413, CompSci 112, 150, 425, 444, 469, 530, 552, 557, CurrIns 530, 547, English 439, HCA 444, 542, INFOST 325, 370, 375, 685. At least 8 credits must be completed at UWM. The student must maintain a minimum GPA, as specified by department, in courses used to complete the certificate.

VI. Proposed Effective Date **Fall 2018**

VII. Comment

The currently approved program is not currently in the UG catalog (the UG catalog contains information on the program before it was modified in May 2017).

The current text should be available in approved OPC #2356.

VIII. Approval

Vice Chancellor's Signature _____
Date _____

3.7   AWARDS AND RECOGNITION COMMITTEE

3.7.1 Membership:

a. The Awards and Recognition Committee shall consist of five (7) voting members and one ex-officio representing CEAS administration: six faculty members and one student..

b. The faculty members shall be elected with one member from each department.

c. The student member shall be a CEAS student in good standing. The student will be selected yearly by the Council of Engineering Student Organizations (CESO).

d. The Office of the Dean shall designate one CEAS staff member to serve as a voting member of the committee for two (2) years.

3.7.2 Responsibilities:

a. The Committee shall be responsible for soliciting nominations from faculty, and staff or the following awards:

1. Outstanding Faculty & Staff Teaching Award (Spring)
2. Outstanding Faculty Research Award (Spring)
3. Outstanding Faculty Service Award (Spring)
4. Outstanding Staff Service Award (Spring)
5. Outstanding Student Award (Fall and Spring)

b. No more than one person shall be selected for each of the first four awards.

c. The committee shall also make recommendations to the Dean related to establishment and awarding of scholarship funds to students within the College.

3.7.3 Election Procedures:

a. Nominations may be made by faculty, groups of faculty, or departments.

b. The Secretary of the Faculty conducts the election in April of each year. Three members are to be elected in even years, and three members are to be elected in odd years.

c. The first faculty in alphabetical order shall call the first meeting to elect a chairperson.

RESOLUTION ON TA POSITION APPOINTMENTS

Whereas -

The primary mission of a university is the education of students; and
according to UWM Policies and Procedures, ``the title `Teaching Assistant' (TA) is used for graduate students enrolled in the University of Wisconsin System who are regularly assigned teaching and related responsibilities (other than manual or clerical responsibilities) under the supervision of a member of the faculty. (and) ... teaching assistants are counted as instructional staff''; and

Whereas -

Requiring a TA to also serve as a research assistant by maintaining a particular faculty member as his or her major advisor does not serve any direct educational goal (for either the TA or the students he or she helps teach); and

Whereas -

Linking the position of a TA to having a particular faculty advisor for his/her dissertation may lead to several negative consequences including: devaluing the importance of quality teaching, increasing the likelihood of personal conflict among faculty members competing for TAs to support their research, reducing the academic opportunities of graduate students to freely choose their advisor or research path, and making it harder for the CEAS to recruit and retain the highest quality graduate students;

Be it resolved -

That Computer Science faculty and GPSC propose CEAS adopt a college-wide policy disallowing making teaching positions contingent on the student's maintaining a particular faculty member as their academic (e.g. dissertation) advisor.