

Office of the Provost and Vice Chancellor  
for Academic Affairs

Swanlund Administration Building  
601 East John Street  
Champaign, IL 61820



November 10, 2009

Abbas Aminmansour, Chair  
Senate Committee on Educational Policy  
Office of the Senate  
228 English Building, MC-461

Dear Professor Aminmansour:

Enclosed is a copy of a proposal from the College of Engineering to revise the BS in Mechanical Engineering.

This proposal has been approved by the College of Engineering Executive Committee. It now requires Senate review.

Sincerely,

A handwritten signature in cursive script that reads "Kristi A. Kuntz".

Kristi A. Kuntz  
Assistant Provost

KAK/dkk

Enclosures

c: I. Adesida  
R. Dennis  
P. Ferreira  
S. Kamin  
C. Livingstone  
J. Phillips  
M. Pleck  
M. Rood  
C. Tucker

UNIVERSITY OF ILLINOIS  
AT URBANA-CHAMPAIGN

RECEIVED

NOV - 5 2009

OFFICE of the PROVOST

College of Engineering

Executive Committee  
306 Engineering Hall, MC-266  
1308 West Green Street  
Urbana, IL 61801



October 28, 2009

Kristi Kuntz  
Assistant Provost  
217 Swanlund Administration Building  
MC-304

Via: Ilesanmi Adesida, Engineering College

Dear Ms. Kuntz:

The College of Engineering Executive Committee has reviewed and approved the following:

Revision to: **B.S. in Engineering Mechanics in the College of Engineering**

Revision to: **B.S. in Mechanical Engineering in the College of Engineering**

Attached is a copy of the request.

Sincerely yours,

Samuel N. Kamin, Secretary  
Executive Committee

Approval Recommended:

Ilesanmi Adesida, Dean  
College of Engineering

10/29/09  
Date

Enclosure

c: Placid Ferreira  
Michael Pleck  
Mark Rood  
James Phillips  
Charles Tucker  
Robin Dennis

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**Senate Educational Policy Committee  
Proposal Check Sheet**

**PROPOSAL TITLE** (Same as on proposal): Revision To B.S. In Mechanical Engineering In  
The College Of Engineering

**PROPOSAL TYPE** (Please select all that apply below):

**A.  Program and degree proposals**

1. This proposal is for a graduate program or degree

Yes  No

2. **Degree** proposal (e.g. B.S.A.E., M.S.C.E.)

New degree - - please name new degree name: \_\_\_\_\_

Revision of an existing degree - - please name of the existing degree to be revised:  
\_\_\_\_\_

3. **Major** proposal (disciplinary focus e.g. Mathematics, Mechanical Engineering)

New major - - please name new major: \_\_\_\_\_

Revision of an existing major - - please indicate the name of the existing major to be  
revised: Mechanical Engineering

4. **Concentration** proposal (e.g. Financial Planning)

New concentration - - please name new concentration: \_\_\_\_\_

Revision of an existing concentration - - please name the existing concentration to be  
revised: \_\_\_\_\_

5. **Minor proposal** (e.g. Cinema Studies) New minor - - please name new concentration: \_\_\_\_\_ Revision of an existing minor - - please name the existing concentration to be revised:  
\_\_\_\_\_6.  Proposal for terminating an existing degree, major, concentration or minor

Please name and nature of the existing degree, major, concentration or minor: \_\_\_\_\_

7.  Proposal for a multi-institutional degree between Illinois (UIUC) and a foreign institution

Please name the existing Illinois degree or program: \_\_\_\_\_

Please name the partnering institution: \_\_\_\_\_

**B.  Proposal for renaming existing academic units** (college, school, department, or program)

Please provide the unit's current name: \_\_\_\_\_

Please provide the unit's proposed new name: \_\_\_\_\_

**C.  Proposal for re-organizing existing units** (colleges, schools, departments, or programs) Change in status of an existing and approved unit (e.g. change from a program to department). Please indicate current unit name including status: \_\_\_\_\_ Transfer an existing unit

Please provide the current unit's name and home: \_\_\_\_\_

Please provide the new home for the unit: \_\_\_\_\_

 Merge two or more existing units (e.g. merge department A with department B)

Name and college of unit one to be merged: \_\_\_\_\_

Name and college of unit two to be merged: \_\_\_\_\_

 Terminate an existing unit. Please provide the current unit's name and status: \_\_\_\_\_**D.  Other educational policy proposals** (e.g. academic calendar, grading policies, etc.)

Please indicate the nature of the proposal: \_\_\_\_\_



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## Proposal to the Senate Educational Policy Committee

### PROPOSAL TITLE:

Revision to B.S. in Mechanical Engineering in the College of Engineering

### SPONSOR:

Prof. James W. Phillips  
Associate Head for Undergraduate Programs  
Department of Mechanical Science and Engineering (MechSE)  
333-4388  
jwp@illinois.edu

### COLLEGE CONTACT:

Prof. Charles L. Tucker III  
Associate Dean for Undergraduate Programs (Engineering)  
333-2280  
ctucker@illinois.edu

### BRIEF DESCRIPTION:

The number of hours required for graduation is being reduced by 4 hours from 132 to 128. The reduction is achieved by introducing a 4-hour Science Electives requirement to replace the required 8 hours of CHEM 104/105 (4 hours) plus PHYS 213/214 (4 hours).

### JUSTIFICATION:

The College of Engineering has requested all its academic departments to reduce the number of hours required for graduation in their respective undergraduate curricula to 128. This change should help the College retain more undergraduate students and allow them to complete their studies in 4 years.

The change not only reduces the required combined course work in chemistry and physics—thereby bringing the curriculum more in line with Mechanical Engineering curricula at other major research institutions—but also allows the student more flexibility in selecting basic science course work, by adding an introductory molecular and cellular biology course among the student's options.

Proposal to Revise the B.S. in Mechanical Engineering—October 2009

Details of the justification are provided in the attached Appendix I—Amplification of Justification Statement.

**BUDGETARY AND STAFF IMPLICATIONS:**

- a. Additional staff and dollars needed—None
- b. Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.)—No reallocations within the sponsoring department; no change in student–faculty ratio.
- c. Effect on course enrollment in other units and explanations of discussions with representatives of those departments— Negligible reduction of overall enrollment in CHEM 104/105, reduction of as many as 200 students/year in PHYS 213 and PHYS 214, possible small increase of enrollment in MCB 150/151; discussions were advanced in monthly College of Engineering meetings of the Chief Advisors of Engineering-administered curricula.
- d. Impact on the University Library—None
- e. Impact on computer use, laboratory use, equipment, etc.—A reduction in laboratory use in Physics for PHYS 213/214

**DESIRED EFFECTIVE DATE:**

Fall 2010

**STATEMENT FOR PROGRAMS OF STUDY CATALOG:**

Attached in Appendix II—Statement for *Programs of Study Catalog* is a marked-up copy from the current *Programs of Study Catalog* showing the effect of the curriculum revision on both the Curricular Requirements and the Suggested Sequence.

Proposal to Revise the B.S. in Mechanical Engineering—October 2009

**CLEARANCES:**

Signatures:

James W. Phillips  
Unit Representative: James W. Phillips

October 19, 2009  
Date:

[Signature]  
College Representative:

11/2/09  
Date:

\_\_\_\_\_  
Graduate College Representative:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Provost Representative:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Educational Policy Committee Representative:

\_\_\_\_\_  
Date:

# Appendix I

## Amplification of Justification Statement

This appendix presents survey data and conclusions to support the introduction of a 4-hour Science Electives requirement to replace the required 8 hours of CHEM 104/105 (4 hours) plus PHYS 213/214 (4 hours). A result of the change is to reduce the number of hours for graduation from 132 to 128, as requested by the College.

In its deliberations, the MechSE Undergraduate Programs Committee, as well as the College of Engineering review subcommittee, examined the science requirements in Mechanical Engineering curricula at selected U.S. universities. While it is important to use peer institutions as benchmarks for curriculum revision, the MechSE Department recognizes that strong efforts should be made to maintain the uniqueness of the ME program at the University of Illinois. New faculty hires in the Department may point to the expansion of the ME domains into new areas, such as nanotechnology, where a different emphasis on core knowledge may be needed. Such specialized fundamental knowledge also impacts preparation of students for graduate studies.

### ***Role of faculty advising***

The MechSE Department will pay particular attention to the process of advising students in their selection of the science electives. As noted in Appendix II—Statement for *Programs of Study Catalog*, the following explanation will appear in the curriculum description (**bold** added for emphasis here):

Science electives — 4 hours required. Choose from CHEM 104 + CHEM 105, MCB 150, or PHYS 213 + PHYS 214. **Guidance from the student's faculty advisor should be sought in selecting the best option for the student's professional development.** If MCB 150 is taken, then MCB 151 is strongly recommended. PHYS 213 and 214 have PHYS 211 and 212, respectively, as prerequisites, in addition to MATH 241.

Selection of these courses earlier in the program will have an important impact on a student's preparation for entry into several ME domains. For example, the somewhat specialized fundamental tools and their application presented in PHYS 214 are covered in very few if any courses elsewhere on the campus. Exposing students earlier on to these tools applied at the atomic level may inspire them to explore such emerging areas of technology as nanomechanics and nanomanufacturing, and ultimately pursue graduate studies in these areas. Therefore, student advising will be a key factor in helping students take advantage of these opportunities.

### ***Specific examples and data illustrating curriculum alignment with ME curricula at other major research institutions***

A review was carried out of the equivalent curricula of the top four institutions<sup>1</sup> ranked by *U.S. News and World Report* as well as the Big 10 institutions.

- At MIT, UC–Berkeley, and University of Michigan, only two physics courses equivalent to PHYS 211 and 212 are required.

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<sup>1</sup> UIUC's College of Engineering is currently ranked fifth in undergraduate engineering programs by *U.S. News and World Report*.



## Appendix I—Amplification of Justification Statement

- At Stanford, the equivalent of 3 quarters (2 semesters) of physics *or* chemistry is required, along with 1 quarter (2/3 semester) of the other.
- A 2008 detailed survey of the Big 10 ME curricula (Tables I.1, I.2) showed that the average number of hours of required physics courses taken (with Illinois' 12 hours included in the average) was either 8.3–8.5 or 8.8, depending on how the courses were enumerated. PHYS 211/212 comprise 8 credit hours in total.
- The same survey of the Big 10 institutions (Tables I.1, I.2) showed that the average number of hours of required chemistry courses taken (with Illinois' 8 hours included in the average) was 5.2–6.0 or 5.8, depending on how the courses were enumerated, with this average being dependent on the relative emphases on physics and chemistry. CHEM 102/103 comprise 4 credit hours in total.

### ***Justification for removing PHYS 213/214 and CHEM 104/105 as required courses and offering them as science electives***

#### **Removal of PHYS 213—Thermal Physics as a required course**

- All ME students are required to take ME 300—Thermodynamics, which covers the material in PHYS 213 from a macroscopic perspective.
- Students are also able to take ME 404—Intermediate Thermodynamics as a MechSE Elective or Technical Elective, in which an in-depth discussion of microscopic principles of thermal physics is covered.
- PHYS 213 is not specified as a prerequisite for any course in the ME curriculum, including ME 300.
- The Departments of Materials Science and Engineering and of Chemical and Biomolecular Engineering, which cover thermal physics as part of the required courses in their respective curricula, do not appear to require PHYS 213.

#### **Removal of PHYS 214—Quantum Physics as a required course**

The material covered in PHYS 214 is typically not covered in other courses. PHYS 214 is relevant to some areas in the ME domain—for example, nanotechnology, for which students would be strongly encouraged to take PHYS 214. However,

- PHYS 214 is not specified as a prerequisite for any course in the ME curriculum.

#### **Removal of CHEM 104/105—General Chemistry II as required courses**

The material covered in CHEM 104/105 is also relevant to some areas in the ME domain—for example, materials and combustion, for which students would be strongly encouraged to take CHEM 104/105. However,

- CHEM 104/105 are not specified as prerequisites for any course in the ME curriculum.

***Justification for including MCB 150—Molecular and Cellular Basis of Life as a science elective***

- There is a growing demand from students to undertake courses related to biomechanics, and MCB 150 is a strongly recommended precursor to biomechanics courses taught in the Department.
- The MechSE Department has recently added three new courses in biomechanics, all of which may be taken as MechSE Electives or Technical Electives:

ME/BIOE 481—Whole-Body Musculoskeletal Biomechanics

ME/BIOE 482—Musculoskeletal Tissue Mechanics

ME/BIOE 483 (proposed)—Mechanobiology

These courses complement another MechSE course introduced earlier by the former Department of Theoretical and Applied Mechanics, which may also be taken as a MechSE Elective or Technical Elective:

TAM/BIOE 461—Tissue Biomechanics

Appendix I—Amplification of Justification Statement

**Table I.1. Credit Overview—Big 10 Undergraduate Mechanical Engineering Curricula  
(Reported in Equivalent Semester Credit Hours), May 2008**

<b>University</b>	Math & Statistics	Physics	Chemistry	Life Sciences	Required <sup>1</sup> Eng.	Technical Electives	Hum. & Soc. Sci.	Rhetoric & Commun.	Free Electives	Other	Total (Excl PE)
Illinois	20	12	8		52	12	18	4	6		132
Iowa	19	7	4		58	21	15	4			128
Michigan	19	10	5		57	12	16	(incl. in Req. Eng.)	9		128
Michigan State	17	8	5	3	54	12	16	4	9		128
Minnesota	18	8	4	4	59	16	15	4			128
Northwestern	16	10.7	5.3		45.3	13.3	18.7	5.3	13.3		128
Ohio State	16	10	6		57	11	19	7			126
Penn. State	17	10	6 or 3	0 or 3	56	12	18	9			128
Purdue	19	7	4 or 8		51 or 55	18	18	6	3		130
Wisconsin	19	5 or 8	9 or 4		58	9	15	3	2 or 4		121
<b>Averages:</b>	18.2	8.3 or 8.5	6.0 to 5.2	0.7 to 1.0	56.0	13.5	16.9	4.7	4.2 to 4.4		128.5

<sup>1</sup> Includes computer science but excludes engineering courses taken as technical electives

Appendix I—Amplification of Justification Statement

Table I.2. Survey of Undergraduate Mechanical Engineering Programs, May 2008

Subject	Illinois	Iowa	Mich.	Mich. State	Minn.	NU	Ohio State	Penn. State	Purdue	Wis.	Big 10 Ave.
1. Calculus & Differential Equations	14	14	14	14	14	13.3	16	14	18	14.4	14.5
2. Physics	12	11	10	8	8	5.3	10	10	7	5	8.8
3. Chemistry	8	5	5	5	4	5.3	6	6 or 3	4 or 8	9	5.8
4. Life Sciences				3	4			0 or 3			0.7
5. Introduction to Engineering	0	1.5	4	2	4		4	2	1	2	1.2
6. Engineering Computations	3	3	4	2	4	1.3	2.6	3	4 or 8		3.1
7. Engineering Graphics	3	1.5		2				2	2	5	1.5
8. Statics, Dynamics, Mechanics of Materials	8	8	10	10	7	10.0	8	11	9	10	9.1
9. Electrical Engineering, Circuits	4	3	4	3	5	2.7	4	3	4	6	3.9
10. Measurements and Instrumentation	3.5	4				2.7	4.7	3	3	3 (lab)	2.3
11. Sys. Dynamics, Vibrations & Controls	3.5	3	4	8	4	7.3	4.7	6	3	3	4.8
12. Thermodynamics	3	6	3	3	3	4.3	4.7	3	3	3	3.9
13. Fluid Mechanics	4	4	3	4	3	4.3	4.7	3	4	3	3.6
14. Heat Transfer	4	3	3	5	3	2.7	2.7	3	4	3	3.3
15. Mechanical Engineering Laboratory		4	8 <sup>1</sup>		8		2	2		3	2.9
16. Materials	4	3	2	3	4	2.7	2	3	3	3	3.0
17. Manufacturing	3				4	4.7	2	3		6	2.1
18. Mechanisms, Kinematics	2			3	2		2.7	0			1.3
19. Machine/Component Design	4	3	2	3	2	2.7	7.3	3	4	3	3.4
20. Other Design Courses (excl. Capstone)		11 <sup>1</sup>	6 <sup>2</sup>			4.0			9	0	3.3
21. Capstone Design Course(s)	3 <sup>1</sup>	3 <sup>1</sup>	4 <sup>1</sup>	3	4	2.7	2	3	3	3	3.2
22. Linear Algebra	3	2	2		2	1.3		2	1	1.5	1.5
23. Probability and Statistics	3	3	Or #24	3	4		1	1		3	2.0
24. Advanced or Applied Mathematics			3	3							0.6
25. Numerical Methods			Or #24				2			3	0.5
26. Engineering Economics			4 <sup>4</sup>				2			1	0.3
27. Technical Communications					4	2.7	2	6	1	5	1.9
28. Rhetoric	4	4		4		2.7	6	3	6		3.0
29. Technical Electives	12	12	12	12	16	13.3	8	12	12	9	12.3
30. Non-Technical Electives	18	16	12 <sup>3</sup>	16	15	18.7	19	18	18	15	16.9
31. Free Electives	6		9	9		13.3			3	0	4.8
TOTAL (Physical Education Excluded)	132	128	128	128	128	128	130	128	130	120	128.5

<sup>1</sup>Course contains significant communications content.; <sup>2</sup> Includes material on manufacturing. <sup>3</sup> one course in Economics required. <sup>4</sup>Macro or micro economics ( not necessarily engineering economics)

## Appendix II

### Statement for *Programs of Study Catalog*

*Changes to result from the proposed curriculum revision are shown as Track Changes edits.*

## Mechanical Science and Engineering

### Mechanical Science and Engineering

Department Head: Placid M. Ferreira

Department Office: 144 Mechanical Engineering Building, 1206 West Green, Urbana, (217) 333-1176

## Curriculum in Mechanical Engineering

[www.mechse.uiuc.edu](http://www.mechse.uiuc.edu)

Undergraduate Program Office: 154 Mechanical Engineering Building

Fax: (217) 244-6534

E-mail: [mechse-undergrad@uiuc.edu](mailto:mechse-undergrad@uiuc.edu)

## For the Degree of Bachelor of Science in Mechanical Engineering

Mechanical engineering may be the most diverse of the engineering fields, embracing many subfields and affecting all aspects of our lives. Mechanical engineers work on new machines, products, and processes that hold the promise of better lives for all of us. They are concerned with both technological and economic aspects in the design, development, and use of their products. Today, one of the challenges is to design efficient, low-cost machines and processes that use the fewest possible natural resources to improve the lives of people throughout the world.

The technical portion of the mechanical engineering curriculum is designed as a sequence of increasingly specialized experiences. The entering student's first year is spent mastering the basics of science: math, chemistry, and physics. Building on this base, in the second year students begin to take fundamental engineering courses such as statics, dynamics, basic circuits and electronics, thermodynamics, and strength of materials. By the third year, students are taking specialized mechanical engineering courses in the subfields of fluid mechanics, heat transfer, dynamic systems and controls, materials, mechanical design, and manufacturing. Finally, during the senior year, students have the opportunity to both broaden and deepen their knowledge of the field through technical elective courses. At the end of the curriculum, students take the capstone senior design course in which the knowledge and skills they have learned are applied to projects submitted to the department by industrial firms or by faculty members. Engineering design, communication, teamwork, and laboratory experiences are integrated throughout the curriculum from the first year to the last year.

A combined B.S.-M.S. Mechanical Engineering degree program is available. Its admission and course requirements are described in the [College of Engineering program information section](#).

## Overview of Curricular Requirements

The curriculum requires ~~132~~128 hours for graduation and is organized as shown below.

Technical grade point average requirements for graduation and advanced-level course registration apply to students in this curriculum. These rules are summarized at the College of Engineering's [undergraduate advising Web site](#).

### Orientation and Professional Development

These courses introduce the opportunities and resources your college, department, and curriculum can offer you as you work to achieve your career goals. They also provide the skills to work effectively and successfully in the engineering profession.

Hours	Requirements
0	ENG 100—Engineering Orientation <sup>1</sup>
0	ME 390—Seminar
0	Total

1. External transfer students take ENG 300—Engrg Transfer Orientation instead.

### Foundational Mathematics and Science

These courses stress the basic mathematical and scientific principles upon which the engineering discipline is based.

Hours	Requirements
3	CHEM 102—General Chemistry I
1	CHEM 103—General Chemistry Lab I
<del>3</del>	<del>CHEM 104—General Chemistry II</del>
<del>1</del>	<del>CHEM 105—General Chemistry Lab II</del>
4	MATH 221—Calculus I <sup>1</sup>
3	MATH 231—Calculus II
4	MATH 241—Calculus III

3	MATH 285—Intro Differential Equations
3	MATH 415—Applied Linear Algebra
4	PHYS 211—University Physics: Mechanics
4	PHYS 212—University Physics: Elec & Mag
<del>2</del>	<del>PHYS 213—Univ Physics: Thermal Physics</del>
<del>2</del>	<del>PHYS 214—Univ Physics: Quantum Physics</del>
<u>3729</u>	Total

1. MATH 220—Calculus may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

### **Mechanical Engineering Technical Core**

These courses stress fundamental concepts and basic laboratory techniques that comprise the common intellectual understanding of mechanical engineering.

<b>Hours</b>	<b>Requirements</b>
3	CS 101—Intro Computing: Engrg & Sci
3	ECE 205—Elec & Electronic Circuits
1	ECE 206—Elec & Electronic Circuits Lab
3	ME 170—Computer-Aided Design
3	ME 300—Thermodynamics
4	ME 310—Introductory Gas Dynamics
4	ME 320—Heat Transfer
4	ME 330—Engineering Materials
3.5	ME 340—Dynamics of Mechanical Systems
3	ME 350—Design for Manufacturability
3.5	ME 360—Signal Processing
3	ME 370—Mechanical Design I
3	ME 371—Mechanical Design II

3	ME 470—Senior Design Project
2	TAM 210—Introduction to Statics
3	TAM 212—Introductory Dynamics
3	TAM 251—Introductory Solid Mechanics
52	Total

### Technical Electives

The science electives augment the foundational science courses in an area of interest and preparation for later courses. The MechSE, statistics, and additional technical These courses stress the rigorous analysis, design, and statistics principles practiced in mechanical engineering.

Hours	Requirements
4	<u>Science electives, chosen from one of the following:</u> <u>CHEM 104 + CHEM 105 or</u> <u>MCB 150 or</u> <u>PHYS 213 + PHYS 214</u>
6	MechSE elective chosen from a <a href="#">departmentally approved list</a> .
3	Statistics elective, one course chosen from: IE 300—Analysis of Data <b>or</b> STAT 400—Statistics and Probability I
6	Technical electives chosen from a <a href="#">departmentally approved list</a> .
<del>15</del> 19	Total

### Social Sciences and Humanities

The social sciences and humanities courses, as approved by the College of Engineering, ensure that students have exposure in breadth and depth to areas of intellectual activity that are essential to the general education of any college graduate.

Hours	Requirements
3	ECON 102—Microeconomic Principles <b>or</b> ECON 103—Macroeconomic Principles
15	Electives in social sciences and humanities approved by the College of Engineering and satisfying the campus general education requirements for social sciences and humanities, including cultural studies western and non-western.



18	Total
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### Composition

These courses teach fundamentals of expository writing.

Hours	Requirements
4	RHET 105—Principles of Composition
	Advanced Composition (satisfied by completing ME 470 in the Mechanical Engineering Technical Core )
4	Total

### Free Electives

These unrestricted electives give the student the opportunity to explore any intellectual area of unique interest. This freedom plays a critical role in helping students to define research specialties or to complete minors.

Hours	Requirements
6	Free electives. Additional unrestricted course work so that there are at least <del>128</del> <sup>132</sup> credit hours earned toward the degree.

### Suggested Sequence

The schedule that follows is illustrative, showing the typical sequence in which courses would be taken by a student with no college course credit already earned and who intends to graduate in four years. Each individual's case may vary, but the position of required named courses is generally indicative of the order in which they should be taken.

#### First year

Hours	First Semester
3	CHEM 102—General Chemistry I
1	CHEM 103—General Chemistry Lab I
0	ENG 100—Engineering Orientation
4	MATH 221—Calculus I <sup>1</sup>
4-3	RHET 105—Principles of Composition <b>or</b> ME 170—Computer-Aided Design <sup>2</sup>
3	Elective in social sciences or humanities <sup>3</sup>

15-14	Total
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Hours	Second Semester
3	CHEM 104—General Chemistry II
1	CHEM 105—General Chemistry Lab II
4	Science Elective <sup>7</sup>
3	MATH 231—Calculus II
3-4	ME 170—Computer-Aided Design <b>or</b> RHET 105—Principles of Composition <sup>2</sup>
4	PHYS 211—University Physics: Mechanics
3	Elective in social sciences or humanities <sup>3</sup>
17-18 14-15	Total

### Second year

Hours	First Semester
3	CS 101—Intro Computing: Engrg & Sci
4	MATH 241—Calculus III
4	PHYS 212—University Physics: Elec & Mag
2	TAM 210—Introduction to Statics
3	Elective in social sciences or humanities <sup>3</sup>
16	Total

Hours	Second Semester
3	ECE 205—Elec & Electronic Circuits
1	ECE 206—Elec & Electronic Circuits Lab

3	MATH 285—Intro Differential Equations
3	ME 300—Thermodynamics
<del>2</del>	<del>PHYS 213—Univ Physics: Thermal Physics</del>
3	TAM 212—Introductory Dynamics
3	TAM 251—Introductory Solid Mechanics
<del>18</del> 16	Total

### Third year

Hours	First Semester
3	MATH 415—Applied Linear Algebra
4	ME 310—Introductory Gas Dynamics
4	ME 330—Engineering Materials
3.5	ME 340—Dynamics of Mechanical Systems
<del>2</del>	<del>PHYS 214—Univ Physics: Quantum Physics</del>
<del>3</del>	<del>Elective in social sciences or humanities<sup>3</sup></del>
<del>16.5</del> 17.5	Total

Hours	Second Semester
4	ME 320—Heat Transfer
3	ME 350—Design for Manufacturability
3.5	ME 360—Signal Processing
3	ME 370—Mechanical Design I
0	ME 390—Seminar
3	Elective in social sciences or humanities <sup>3</sup>
16.5	Total

## Fourth year

Hours	First Semester
3	ME 371—Mechanical Design II
3	MechSE elective <sup>4</sup>
3	Statistics elective <sup>5</sup>
3	Technical elective <sup>6</sup> <b>or</b> ME 470—Senior Design Project
3	Elective in social sciences or humanities <sup>3</sup>
3	Free elective
18	Total

Hours	Second Semester
3	ME 470—Senior Design Project <b>or</b> Technical elective <sup>6</sup>
3	MechSE elective <sup>4</sup>
3	Technical elective <sup>6</sup>
3	Elective in social sciences or humanities <sup>3</sup>
3	Free elective
15	Total

1. MATH 220—Calculus may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

2. RHET 105 may be taken in the first or second semester of the first year as authorized. The alternative is ME 170.

3. Each student must satisfy the 18-hour social sciences and humanities requirements of the College of Engineering, including ECON 102 or 103, and campus general education requirements for social sciences and humanities.

4. MechSE electives — 6 hours required. Choose from a departmentally approved list of

MechSE Electives.

5. Statistics elective — 3 hours required. IE 300 or STAT 400 must be taken.

6. Technical electives — 6 hours required. Choose from a departmentally approved [list of Technical Electives](#).

7. Science electives — 4 hours required. Choose from CHEM 104 + CHEM105, MCB 150, or PHYS 213 + PHYS 214. If MCB 150 is taken, then MCB 151 is also recommended. Note that PHYS 213 and PHYS 214 will normally be taken in the fourth semester or later, since they have PHYS 211 and PHYS 212, respectively, as prerequisites, in addition to MATH 241.

**Draft Minutes**  
**College of Engineering Executive Committee (EC) Meeting**  
**Tuesday, 1:00 p.m., October 27, 2009**  
**301 Engineering Hall**

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**Present:**

R. Bhargava (BioE)*	B. Heuser (NPRE)	M. Rood (CEE)
N. Cheng (MNTL)	P. Kalita (ABE)	C. Tucker (Admin)
B. Conway (AE)	S. Kamin (CS)	John Unger** (undergrad, CS)
G. Dullerud (MechSE)	D. Jones (ECE)	
P. Goldbart (Phys)	H. Reis (IESE)*	

**Absent:**

I. Adesida (Admin)	R.S. Sreenivas (IESE)	H. Zhao (ChBE)
V. Coverstone (Admin)	J. Weaver (MatSE)	
B. Cunningham (BioE)	M. Wong (CSL)	

\* = alternate

\*\* = guest

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1. The meeting was called to order at 1:05.

2. Approval of the Draft Minutes from Oct. 20, 2009.

The minutes were approved unanimously (save two abstentions), with minor revisions.

3. New/Old Business

a. Undergrad Physics Minor Proposal

Chuck Tucker explained the issue that caused us to table this proposal in the last meeting, which was the number of hours in this minor; at 21-25 hours, the minor arguably exceeds the campus guidelines. Chuck discussed this with Kristi Kuntz in the provost's office, and she allowed that this was not a "show-stopper." In fact, it is quite possible to get this minor with 21 hours, which is at the high end of the campus guidelines, but does not exceed them. *The ad hoc committee report endorsing the new minor was approved unanimously.*

b. Feedback to Faculty about their work as advisors (Charles Tucker & John Unger, junger3)

Chuck introduced student John Unger (CS), who works with student group called Engineering Initiatives. This group proposes to give an online survey on advising, with the cooperation of the college academic affairs office. A draft of the proposed survey was provided. This is proposed as an online survey, with anonymity of respondents guaranteed, probably to be given just after early registration. There was a vigorous discussion about the survey and its uses, and about advising in general. Concerning who will see the data, the current plan is that advisors will see the data applicable to themselves; department heads will see summaries for each advisor; and the college will see summaries of departments. The problem of potential fraud in filling out online surveys was brought up by Henrique Reis. Paul Goldbart pointed out that private schools do a much better job of advising than we do. Geir Dullerud said it was important that the survey not be voluntary, since the results might otherwise be highly skewed. There was some discussion that demographic information about respondents would be useful, but that care should be taken to avoid compromising anonymity. General approbation was expressed for the idea of offering training/mentoring on advising for new faculty; Reis suggested that the quality of advising in each department is substantially a function of the department's leadership. Prasanta Kalita noted that he did interviews last year with award-winning advisors, and that the information he obtained could be useful for improving advising in the college. Sam Kamin said that the CS department had done surveys of advising

in past years, and offered to make those available. The plan is for the survey to be given in one or two departments in the spring, after which a decision will be made about expanding its use.

4. Subcommittee Report -

a. Revision to Undergrad Curriculum in Mechanical Engineering

In addition to the usual responsibilities, the *ad hoc* committee had been given the special charge to consider the advisability of the change in science requirements, which reduces the set of required courses. This they did with great care, and with the cooperation of the MechSE department. The report puts great stress on the role of advising in ensuring that students understand the role of the specific science classes in areas of mechanical engineering, so that they may make an informed choice of courses. *The favorable ad hoc committee report was endorsed unanimously (save one abstention).*

5. The meeting adjourned at 1:45.

The minutes have not yet been approved.  
Respectfully submitted,

A handwritten signature in black ink, appearing to read "S. Kamin". The signature is fluid and cursive, with a long horizontal stroke at the end.

Sam Kamin, Secretary

cc: Robin Dennis  
Michael Pleck