

UNIVERSITY FACULTY SENATE

SUMMARY OF AGENDA

DECEMBER 2, 1996

- I. **ADOPTION OF THE AGENDA**
- II. **APPROVAL OF THE MINUTES:** November 4, 1996
- III. **REMARKS BY PROVOST SCHIAVELLI**
- IV. **ANNOUNCEMENTS:** Senate President Palley

ANNOUNCEMENTS FOR CHALLENGE

- 1. Revision of the Bachelor of Electrical Engineering (BEE)
- 2. Revision of the Bachelor of Mechanical Engineering (BME)
- 3. Revision of the Master of Instruction

- V. **OLD BUSINESS - None**

VI. **NEW BUSINESS**

- A. Recommendation to extend the provisional status of the Ph.D. in Art Conservation Research
- B. Recommendation on amending the Undergraduate Catalog concerning the policy on academic dismissal
- C. Introduction of new business






UNIVERSITY FACULTY SENATE

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November 25, 1996

TO: All Faculty Members

FROM: Joann Browning, Vice President
University Faculty Senate 

SUBJECT: Modification of Faculty Senate Agenda for December 2, 1996 Senate Meeting

The Faculty Senate Agenda for the December 2, 1996 Senate meeting has been modified to include the following:

VI. NEW BUSINESS

- C. Recommendation from the Committee on Diversity and Affirmative Action (V. Martuza, Chairperson), for a "Sense of the Senate" resolution regarding applications from minority candidates during the searches for two Dean positions.

WHEREAS, the University of Delaware has recently reaffirmed its commitment to its long-standing Affirmative Action Policy, and

WHEREAS, the University of Delaware has never had a minority college dean and internal searches tend to restrict the pool of highly qualified minority candidates, and

WHEREAS, financial exigency has not been given as the reason for adopting internal search procedures at this time, be it therefore

RESOLVED, that the current internal searches for the two Dean positions for the two new merged colleges be used to identify interim appointments only, and be it further

RESOLVED, that national searches be initiated no later than September 1, 1997 to identify the best leadership for the new colleges, and be it further



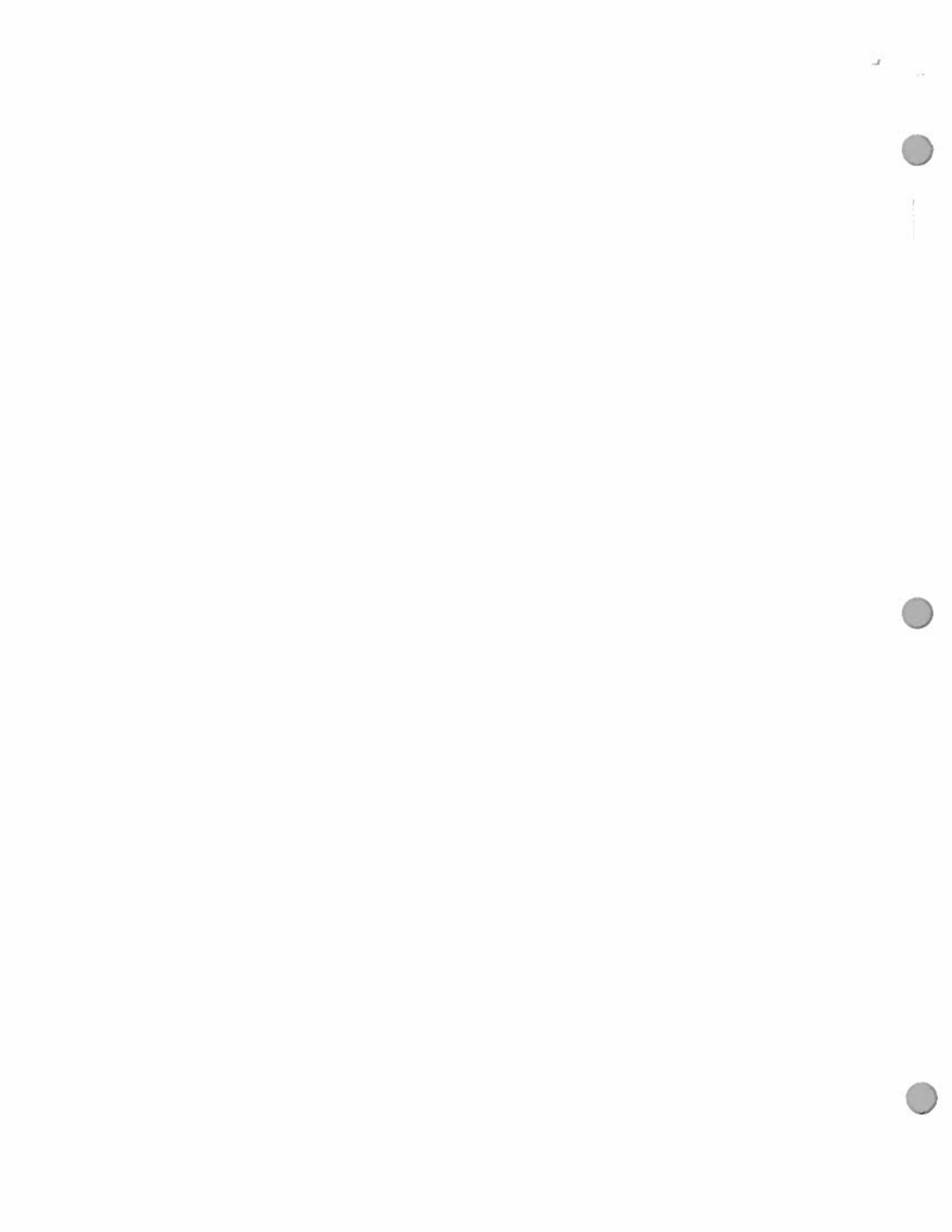
RESOLVED, that extraordinary efforts be instituted to identify and encourage applications from outstanding internal and external minority candidates in all present and future search efforts for both administrators and faculty.

- D. Recommendation from the Committee on Committees and Nominations (C. Denson, Chairperson) for the election of a one-semester replacement on the Committee on Rules. The following have agreed to be placed on the ballot:

Linda Gottfredson, Educational Studies

Jon Olson, Chemical Engineering

- E. [Originally listed under Paragraph C.] Such items as may come before the Senate. (No motion introduced under new business, except a motion to refer to committee, shall be acted upon until the next meeting of the Senate.)





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November 18, 1996

TO: All Faculty Members

FROM: Joann Browning, Vice President
University Faculty Senate

A handwritten signature in black ink, appearing to be "JB", written over the name "Joann Browning" in the "FROM" field.

SUBJECT: Regular Faculty Senate Meeting, December 2, 1996

In accordance with Section IV, paragraph 6 of the Constitution, the regular meeting of the University Faculty Senate will be held on Monday, December 2, 1996 at 4:00 p.m. in room 110 Memorial Hall. The agenda will be as follows:

AGENDA

- I. Adoption of the Agenda.
- II. Approval of the minutes of the Senate meeting of November 4, 1996.
- III. Remarks by Provost Schiavelli.
- IV. Announcements: Senate President Palley
Announcements for Challenge
 1. Revision of the Bachelor of Electrical Engineering (BEE) (Attachment 1)
 2. Revision of the Bachelor of Mechanical Engineering (BME) (Attachment 2)
 3. Revision of the Master of Instruction (Attachment 3)
- V. Old Business - None
- VI. New Business
 - A. Recommendation from the Committee on Graduate Studies (R. Hampel, Chairperson), with the concurrence of the Coordinating Committee on Education (R. Carroll, Chairperson), to extend the

provisional status of the Ph.D. in Art Conservation Research.

WHEREAS, the Ph.D. Program in Art Conservation Research will have students complete dissertations in this academic year, and

WHEREAS, the 1995 external review of this program indicated the importance of such dissertations before making this provisional program permanent, be it therefore

RESOLVED, that the provisional status of the Ph.D. in Art Conservation Research be extended to the Fall of 1997, and be it further

RESOLVED, that in the Fall of 1997, the Committee on Graduate Studies will reconsider the issue of permanent status and forward its recommendation to the Coordinating Committee on Education for action by the Faculty Senate during the 1997-98 academic year.

B. Recommendation from the Committee on Undergraduate Studies (R. Taggart, Chairperson), on amending the Undergraduate Catalog concerning the policy on academic dismissal.

WHEREAS, the University policy currently states that "Academic probation or dismissal may result when a student index for any semester drops below 1.25, or when the quality point deficit is more than 12.99 points," and

WHEREAS, it is difficult to justify dropping students from the University based on one term's performance if their cumulative GPA is 2.0 or better, and

WHEREAS, the practice of dropping students based on a one term index only has not been followed for years in any of the colleges, be it therefore

RESOLVED, that the policy for academic dismissal located in the *Undergraduate Catalog*, under "Scholastic Standing," Probation, paragraph 4, page 16, be

revised as follows: [Underlined words are to be deleted]

Probation: When a baccalaureate degree candidate has a cumulative grade-point index below 2.0, the Committee on Undergraduate Records and Certification places the student on Academic Probation if the quality-point deficit is 12.99 or less. Upon the recommendation of the appropriate college dean, the committee may place a student on probation if the index for any semester is 1.25 or less, even if the cumulative index is above a 2.0.

AND BE IT FURTHER RESOLVED,

that page 17 of the *Undergraduate Catalog*, under Procedure for Readmission of Undergraduate Students Dismissed for Academic Deficiency be revised as follows: [Underlined words are to be deleted]

Undergraduates may be dismissed for academic deficiency when their index for any semester is less than 1.25, or when the quality-point deficit is more than 12.99 points. .

...

- C. Such items as may come before the Senate. [No motion introduced under new business, except a motion to refer to committee, shall be acted upon until the next meeting of the Senate.]

JB/rg

Attachments: Committee Activities Report

1. Revision of the BEE
2. Revision of the BME
3. Revision of the Master of Instruction

COMMITTEE ACTIVITIES REPORT

NOVEMBER 1996

ACADEMIC PRIORITIES REVIEW CTE. (John McLaughlin)

Discussing several long-range priorities, including the library

CULTURAL ACTIVITIES AND PUBLIC EVENTS, CTE. ON (Harris Ross)

Evaluated applications for Spring semester funding

FACULTY WELFARE AND PRIVILEGES, CTE. ON (John McLaughlin)

Continued consideration of policies on sexual harassment

GRADUATE STUDIES, CTE. ON (Robert Hampel)

1. Revised Nursing Graduate Program Policy
2. Revised Chemical Engineering Ph.D. Program
3. Creating Educational Technology specialization in Ed.D.
4. Reviewing 4 + 1 programs

PROMOTIONS AND TENURE, CTE. ON (Lawrence Nees)

1. Reviewing revision of Promotions and Tenure Policy Guidelines of the following units:
Animal and Food Science, Mathematics, Theatre, English Language Institute
2. Completed reviewing proposed revision of Promotions and Tenure Policy Guidelines for Psychology, Business Administration and Food and Resource Economics

RESEARCH, CTE. ON (Thomas Church)

Reviewing GUR guidelines and proposals

UNDERGRADUATE STUDIES, CTE ON (R. Taggart)

Reviewing the following:

- a. Revision of the Physical Education Studies degree
- b. Revision of the B.A. in Educational Studies
- c. Revision of the B.S. in Agriculture
- d. Revision of several B.A. degrees
- e. Communication Condition

Overview of Curriculum changes to B.E.E. Degree

The last revision to the Bachelor of Electrical Engineering (B.E.E.) curriculum was in 1989. The attached revisions are therefore needed to keep pace with the rapid changes within the profession, to maintain compatibility with our new degree in computer engineering, and to reflect changes in our graduate programs.

Curriculum changes:

The following changes have been made to the core curriculum:

ECON151 is now required
 CISC105 is now required
 ELEG418 now replaces ELEG417

The modified core curriculum is reproduced below with changes in bold type:

Fall Term	Spring Term	
	First Year	
CPEG210 Combinational Logic	2	CPEG211 Sequential Circuits 2
CISC105 Intro. Comp. Science I	3	CISC181 Intro. Computer Science II 3
CHEM103 General Chemistry	4	PHYS207 General physics 4
MATH242 Anal. Geometry & Calculus B	4	MATH243 Anal. Geometry & Calculus C 4
General Education Elective	3	ENGL110 Critical Reading & Writing 3
	16	16
	Second Year	
ELEG205 Linear circuit theory	4	ELEG309 Electronic Circuit Analysis I 4
CPEG220 Microprocessor Based Sys. I	2	CPEG221 Microprocessor Based Sys. II 2
PHYS208 General Physics	4	ELEG302 Intro. Devices & Materials 3
MATH341 Diff. Eqns. & Linear Algebra I	3	MATH342 Diff. Eqns. & Linear Algebra II 3
ECON151 Intro. to Microeconomics	3	General Education Elective 3
	16	15
	Third Year	
ELEG305 Signal Processing I	3	ELEG306 Signal Processing II 3
ELEG312 Electronic Circuit Analysis II	4	ELEG310 Random Signals and Noise 3
ELEG320 Field Theory I	3	ELEG340 Solid State Electronics 3
Technical Program Elective		ELEG413 Field Theory II 4
ENGL301 Problems in Composition	3	General Education Elective 3
	13	16
	Fourth Year	
ELEG418 Digital Control Systems	3	ELEG433 Energy systems 3
Technical Program Elective		Technical Program Elective
Technical Program Elective		Technical Program Elective
Technical Program Elective		Technical Program Elective
General Education Elective	3	General Education Elective 3
PHIL 341 Ethics in Eng. Profession	1	6
	7	

This results in a total of 105 credits within the core curriculum.

The following new courses have been created as requirements within electrical engineering concentrations

ELEG428 System Analysis and Control (3) (Replacement for ELEG417 (3))
 ELEG423 Electronic Properties of Matter (3) (Replacement for ELEG623 (3))
 ELEG440 Opto-Electronics (3) (Substituted for ELEG640 (3))
 ELEG450 Semiconductor Device Design and Fabrication (4) (Substituted for ELEG650 (3))

The following courses have been deleted:

ELEG623 Electronic Properties of Matter (3)
 ELEG417 Feedback Control Systems (3)

The following courses have been revised

ELEG302 Introduction to Materials and Devices (3) Change of credit from (4) to (3) and new title
 ELEG412 Introduction to Power Systems Analysis Change of credit from (4) to (3)
 ELEG306 Signal Processing II Change of credit from (4) to (3)

The following courses have been added

CPEG324 Computer Systems Design I
 CPEG464 VLSI Systems

The modified concentrations are reproduced below with changes in bold type:

Computer Engineering		Signals and Systems	
CPEG323 Intro. Computer System Eng.	3	CISC220 Data Structures	3
CPEG324 Computer System Design I	3	MATH426 Numerical Analysis	3
CISC220 Data Structures	3	ELEG403 Communications Systems	3
Technical Program Electives	6	ELEG428 System Analysis and Control	3
CPEG422 Computer System Design II	4	Technical Program Electives	6
or CPEG464 VLSI Systems		and one of	
and one of		CPEG464 VLSI Systems	
CPEG419 Comp. Comm. Networks		ELEG420 Electronic Circuit Design	
CPEG421 Compiler Design		CPEG422 Computer System Design II	4
CISC361 Operating Systems	3	minimum total concentration credits	22
Minimum total concentration credits	22		
Devices and Materials		Power Systems	
PHYS209 General Physics (modern physics)	3	MEEG307 Thermodynamics I	3
PHYS313 Physical Optics	3	MEEG408 Power Generation	3
ELEG423 Electronic Properties of Matter	3	ELEG428 System Analysis and Control	3
ELEG440 Opto-electronics	3	ELEG412 Intro. Power Systems Analysis	3
ELEG450 Semi. Device Design and Fab.	4	ELEG414 Elec. Machines, Motors & Generators	4
Technical Program Electives	6	Technical Program Elective	3
Minimum total concentration credits	22	and one of	
		ELEG420 Electronic Circuit Design	
		CPEG422 Computer System Design II	
		CPEG464 VLSI systems	4
		Minimum total concentration credits	23

COLLEGE: ENGINEERING
DEPARTMENT: ELECTRICAL ENGINEERING
DEGREE: BACHELOR OF ELECTRICAL ENGINEERING

CURRICULUM

To qualify for sophomore standing, students must have satisfactorily completed MATH-242, MATH-243, ~~CISC-105~~, CISC-181, CHEM-103, PHYS-207, CPEG-210, and CPEG-211 by the end of the summer session of their freshman year. With few exceptions, electrical engineering students are expected to complete this program in eight regular semesters. With electrical engineering courses being offered only once each year, it is imperative that students follow as closely as possible the course sequence outlined below.

UNIVERSITY REQUIREMENTS

ENGL110 Critical Reading & Writing 3 1S
Multi-cultural requirement 3 1-4

COLLEGE REQUIREMENTS

General Education 18 1-4

MAJOR REQUIREMENTS

External to the College

ECON151 Introduction to Microeconomics 3 2F
ENGL301 Problems in Composition 3 3F
PHIL341 Ethics in the Eng. Profession 1 4F

Mathematics

MATH242 Anal. Geometry & Calculus B 4 1F
MATH243 Anal. Geometry & Calculus C 4 1S
MATH341 Diff. Eqns. & Linear Algebra I 3 2F
MATH342 Diff. Eqns. & Linear Algebra II 3 2S

Chemistry

CHEM103 General Chemistry 4 1F

Physics

PHYS207 General physics 4 1S
PHYS208 General Physics 4 2F

Computer Science

CISC105 Intro. Comp. Science I 3 1F
CISC181 Intro. Computer Science II 3 1S

Within the department

CPEG210 Combinational Logic	2	1F
CPEG211 Sequential Circuits	2	1S
ELEG205 Linear circuit theory	4	2F
CPEG220 Microprocessor Based Sys. I	2	2F
ELEG309 Electronic Circuit Analysis I	4	2S
CPEG221 Microprocessor Based Sys. II	2	2S
ELEG302 Intro. Devices & Materials	3	2S
ELEG305 Signal Processing I	3	3F
ELEG312 Electronic Circuit Analysis II	4	3F
ELEG320 Field Theory I	3	3F/4F
ELEG306 Signal Processing II	3	3S
ELEG310 Random Signals and Noise	3	3S/4S
ELEG340 Solid State Electronics	3	3S
ELEG418 Digital Control Systems	3	4F
ELEG413 Field Theory II	4	3S/4S
ELEG433 Energy systems	3	3S/4S

Design Requirement

Design exercises are included in almost all of the courses in the electrical engineering program, even those whose primary function is the developing of skills in engineering analysis. In addition to this design experience spread throughout the program, each student must enroll in at least one electrical or computer engineering course in which at least one half of the work required in the course is connected with a single design project. In these courses, the student will be required to: 1) complete the design, validating the design where possible with computer simulations, 2) make several oral "design review" presentations to the class in the course of the term, 3) submit a comprehensive written report on their design describing the design problem, alternative solutions considered and the design itself, and 4) whenever possible, build and test a prototype of the design.

Among the courses regularly offered, the following meet this requirement:

ELEG420 Electronic Circuit Design	4
CPEG422 Computer System Design II	4
ELEG450 Semiconductor Device Des. and Fab.	4
CPEG464 VLSI systems	4

Other courses meeting this design requirement will be offered depending on the design interests of the faculty and students. This design requirement can also be met with a "special project" done in conjunction with faculty research or the development of course laboratory material. Such "special projects" must have the prior approval of the director of undergraduate programs.

Technical Electives

Each student must select a concentration to structure his/her technical elective program. Each of the four regular concentrations specifies 16 of the 22 technical elective credits in the core program. The four concentrations are:

Concentration in computer engineering

CISC220 Data Structures	3	3F
CPEG323 Intro. Computer System Eng.	3	3F
CPEG324 Computer System Design I	3	3S
Technical Program Electives	6	
and at least one of:		
CPEG419 Computer Communication Networks	3	4S
CPEG421 Compiler Design	3	4F
CISC361 Operating Systems	3	3S
and at least one design course:		
CPEG464 VLSI Systems	4	4F
CPEG422 Computer System Design II	4	4F

Concentration in signals and systems

CISC220 Data Structures	3	3F
MATH426 Numerical Analysis	3	3F
ELEG403 Communications Systems	3	4F
ELEG428 System Analysis and Control	3	4S
Technical Program Electives	6	
and at least one design course:		
ELEG420 Electronic Circuit Design	4	4S
CPEG422 Computer System Design II	4	4S
CPEG464 VLSI Systems	4	4F

Concentration in devices and materials

PHYS209 General Physics (modern physics)	3	3S
PHYS313 Physical Optics	3	3S
ELEG423 Electronic Properties of Matter	3	4F
ELEG440 Opto-electronics	3	4F
ELEG450 Semiconductor Device Design and Fab.	4	4S
Technical Program Electives	6	3F-4S

Concentration in power systems

MEEG307 Thermodynamics I	3	3F
ELEG412 Intro. Power Systems Analysis	3	4F
ELEG428 System Analysis and Control	3	4F
ELEG414 Elec. Machines, Motors & Generators	4	4S
MEEG408 Power generation system design	3	3S
Technical Program Elective	3	
and at least one design course:		
ELEG420 Electronic Circuit Design	4	4S
CPEG422 Computer System Design II	4	4S
ELEG450 Semiconductor Device Des. and Fab.	4	4S
CPEG464 VLSI systems	4	4F

Unspecified technical electives within each concentration can be selected from the regularly offered courses in the Electrical Engineering Department, as well as from technical courses offered by other departments. A brief list appears below. For more up-to-date postings of electrical engineering courses appropriate for technical electives see our world-wide-web site at www.ee.udel.edu.

Engineering: All 300, 400 and 600 level courses offered by engineering departments except non technical courses in topics such as engineering management, business or patent law, etc. CHEG-231 and CHEG-325, Introduction to chemical engineering thermodynamics.

Chemistry: CHEM-321 and CHEM-322 Organic chemistry.

Computer Science: All 300, 400 and 600 level courses except CISC-480 and CISC-633. CISC-280 Programming paradigms.

Geography: GEOG-620 Atmospheric Physics and GEOG-623 Atmospheric Dynamics

Geology: GEOL-653 and GEOL-654, Elementary geophysics.

Mathematics: All 300, 400, 500 and 600 level courses except MATH-302, 349, 380, 381, and 555. MATH-260, Concepts of analysis.

Proposal to Revise the Requirements for the Bachelor of Mechanical Engineering Degree

The Mechanical Engineering Faculty proposes to revise the requirements for the Bachelor of Mechanical Engineering Degree. The revisions are in response to modifications in accreditation requirements, recognition that the current faculty has a significant number of new members with progressive ideas, and that we want to be able to recruit the best possible students.

The changes are in full compliance with the requirements of the Accreditation Board for Engineering and Technology (ABET). They are also in full compliance with the requirements of the University of Delaware and its College of Engineering.

We carefully considered our ability to serve prospective students, parents, industry, undergraduates anticipating industry, undergraduates anticipating grad school, alumni, working undergraduates, high school teachers and counselors, and ABET.

From this, we developed the following list of important attributes for attracting good students and delivering a meaningful education:

- Education Quality
- Reputation of University, College and Department
- Employability of Graduates
- Value (as in return on investment)
- Connection to High Schools
- Campus Environment
- Adaptability of Graduates
- Accreditation of Program
- Honors Program Opportunity
- Co-op Experience Opportunity

We investigated our existing curriculum in view of our regional competitors at Maryland (121-credit ME program), Penn State, Va. Tech, and Rutgers. We also looked at the developments in the NSF Engineering Education coalitions, as well as current ASME Guidance and future ABET Criteria. References are listed at the end of this proposal.

As a result of our investigation, we have identified several major themes that will lead to the desired improvements in quality, relevance and flexibility.

- Retain the students we recruit.
- Emphasize the core elements of ME.
- Improve course content and flow.
- Integrate design throughout.
- Enable extended industry internships.
- Define a BME Honors Degree.

Our approach to the new curriculum, Table 1, emphasizes both breadth and depth, in turn. In the freshman year, we emphasize the breadth of a good science and math foundation, while introducing our students to the career of mechanical engineering. We also begin the sequence of design experiences culminating in the senior year. The sophomore year is a continuation of science and math along with the foundation engineering science and design courses. The core ME engineering science and design courses are included in the junior year. The senior year is characterized by the capstone design course along with many flexible technical and general education electives to allow for concentration and specialization. General Education requirements automatically emphasize breadth and depth as well.

The ABET requirements are shown at the bottom of the chart. We are clearly in complete compliance with ABET.

As shown in Table 2, we have organized the revisions into the required Undergraduate Catalog format. The color legend is shown at the bottom of the chart. The University and College requirements are unchanged as shown.

In the area of Major Requirements External to the College, we will replace one 3-credit General Education Elective required by our department with a statistics course. Existing Humanities and Social Studies Electives are being re-arranged in the schedule to allow students to mix technical and non-technical courses.

As a result of an analysis of the content of the introductory Chemistry courses, we will drop Chemistry 104, General Chemistry II. It is no longer a pre-requisite for ME courses.

In the Computer and Information Sciences area, we will delete CISC 106, FORTRAN Programming. Instead, we will introduce computing in context in MEEG 101, and will follow up with applications of computing in a number of other courses.

Mathematics changes are summarized here. Our new approach to math is to start quicker and present the math background in time to apply it in our engineering science courses. We analyzed statistics to find that 30% of ME's are already skipping Math 241 and starting directly with Math 242, even though only Math 241 was required. Moreover, some students that currently start with Math 241 probably do so only because it is a required course. Since Chemical Engineering and Electrical Engineering made the change to eliminate Math 241, they have about 30% still taking 241 in Chemical and about 50% in Electrical. Consequently, we will eliminate Math 241 by starting the Math Sequence with Calculus B, Math 242. We will replace Math 302, Ordinary Differential Equations (ODE) with a new course, Math 351, Engineering Math I. We will also replace MEEG 361, Engineering Analysis with MATH 352, Engineering Math II. As discussed above, we will add a 3-credit Statistics for Engineers course. We will also add a 3-credit Numerical Methods course. These changes, along with their catalog descriptions, are shown below.

Fall, FR - MATH 242 - Calculus B

Exponential, log & trig functions; integration techniques; polar coordinates; and series

Spring, FR - MATH 243 - Calculus C

Vectors, partial derivatives, multiple integrals, line integrals, and Green's Theorem.

Fall, SO - MATH 351 - Engineering Mathematics I

Integrated approach to ordinary differential equations and linear algebra. Topics include the solution of ordinary differential equations, systems of linear algebraic equations, vector and matrix algebra, and the eigenvalue problem. Engineering applications.

Fall, SO - STAT 450 - Statistics for the Engr & Phys Sci
Combinatorial probability; distribution theory, estimation, and hypothesis testing. Experimental design, analysis of variance and regression theory.

Spring, SO - MATH 352 - Engineering Mathematics II
Continuation of Math 351. Laplace transforms, scalar and vector field theory, Fourier series, partial differential equations. Engineering applications.

Spring, SO - MATH 353 - Numerical Methods
Numerical methods for solving linear and nonlinear algebraic and differential equations, with applications to problems in mechanical engineering. Course utilizes programming as well as various numerical software tools.

In Physics, we will replace Physics 208, Electricity & Magnetism, with Physics 345, Electrical Physics. This course, with the addition of a Circuits lab, also replaces ELEG 314, Circuits. It introduces Circuits a full two years earlier. We will add Physics 210, Thermal Physics, to introduce our students to Thermodynamics. Its addition will allow Physics to have a Thermodynamics course for their students as well.

Turning to our courses within Engineering, we had some courses that were not as effective as we would like. MEEG 125, Intro to ME, was being taught as a 0-credit survey course. It was not motivating students enough. EGGG 132, Graphics and CISC 106, Intro to Computing were not effective. In the junior year, we had two very difficult semesters, and the Junior Lab was disconnected from the engineering science courses it was intended to support. ELEG 314, Circuits was not effective, and was being offered too late in the curriculum. MEEG 427, System Dynamics was not integrated with other courses well enough. The revisions to Engineering Topics are organized around the elements of Mechanical Engineering. (Thermal, Fluids, Solids, and Design)

In the Thermal Sciences, the addition of the Thermal Physics Course to replace the first MEEG Thermo Course was described earlier. The other change is the addition of a 1-credit shared lab to the second MEEG Thermo Course and the Heat Transfer Course.

In Fluids, we will move a 1-credit lab for the first Fluids course from CE to ME.

In Solids, we will add a lab to MEEG 313, Solid Mechanics, and convert MEEG 427, System Dynamics to Vibrations/Control.

Design

We intend to address design issues throughout the curriculum, starting with the freshman Intro course. We will change MEEG 125, Intro to ME to a 3-credit course and will add computing and team design projects. We will change EGGG 132, Graphics to a CAD/Manufacturing Lab. Senior Design will be compressed to 1 semester to reflect compressed industrial design cycles and attract more industry-sponsored projects.

Summary

As a final revision, we have re-numbered the MEEG courses as shown in Tables 1 and 2 to reflect the new sequence and flow. We are happy with the changes. The resulting curriculum is complete, coherent, and flexible. The two changes of making the final semester all electives, and reducing Senior Design to 1 semester, enable students who get out of sequence to finish in four and a half years. In certain cases, students can have an industry internship of a winter session, spring, and summer session, and still graduate in four and a half years. Some aggressive students may also be able to finish in three and a half years.

References

Integrating the Product Realization Process into the Undergraduate Curriculum, ASME, 1995.

Restructuring Engineering Education: A Focus on Change, NSF, 1995.

Engineering Education in a Changing World, ASEE, 1994
Innovations in ME Curricula for the 90's, ASME, 1994.

Table 1 - ME 2000

Course	Symbol	Cr	Course	Symbol	Cr
Fall - Freshman			Spring - Freshman		
Calculus II	MATH 242	4	Calculus III	MATH 243	4
Chem I	CHEM 103	4	Physics I (Mech)	PHYS 207	4
Intro to ME	MEEG 101	3	Statics	MEEG 112	3
English	ENGL 110	3	Gen. Ed. Elective		3
Total		14	Total		14
Fall - Soph.			Spring - Soph.		
Engr. Math I	MATH 351	3	Engr. Math II	MATH 352	3
Statistics	STAT 450	3	Numerical Methods	MATH 353	3
Electrical Physics	PHYS 345	4	Materials Science	MASC 302	4
Dynamics	MEEG 211	3	CAD/CAM Lab	MEEG 202	3
Mech. of Solids	MEEG 215	4	Gen. Ed. Elective		3
Total		17	Total		16
Fall - Junior			Spring - Junior		
Thermal Physics	PHYS 210	3	Machine Design	MEEG 304	3
Kinematics	MEEG 301	3	Fluids II	MEEG 332	3
Vibration/Control	MEEG 311	4	Heat Transfer	MEEG 342	3
Matls. Engr.	MEEG 321	3	Thermodynamics	MEEG 344	3
Fluids I	MEEG 331	4	Thermal Lab	MEEG 346	1
			Gen. Ed. Elective		3
Total		17	Total		16
Fall - Senior			Spring - Senior		
Senior Design	MEEG 401	6	Technical Elective		3
Technical Elective		3	Technical Elective		3
Technical Elective		3	Gen. Ed. Elective		3
Gen. Ed. Elective		3	Gen. Ed. Elective		3
Total		15	Total		12
ABET Reqt. (%)	UD %	Cr	MEEG Course Legend:		
Math & Sci (25%)	29	35	100's Digit: 1=FR, 2=SO, 3=JR, 4=SR		
Engr Topics (37.5%)	54	65	Tens: 0=Design, 1=Solids, 2=Matl,		
H&SS (12.5%)	15	18	3=Fluids, 4=Thermal		
Other (0%)	2	3	Units Digit: 1=Fall, 2=Spring		
Total	100	121			

Table 1 - ME 2000

Course	Symbol	Cr	Course	Symbol	Cr
Fall - Freshman			Spring - Freshman		
Calculus II	MATH 242	4	Calculus III	MATH 243	4
Chem I	CHEM 103	4	Physics I (Mech)	PHYS 207	4
Intro to ME	MEEG 101	3	Statics	MEEG 112	3
English	ENGL 110	3	Gen. Ed. Elective		3
Total		14	Total		14
Fall - Soph.			Spring - Soph.		
Engr. Math I	MATH 351	3	Engr. Math II	MATH 352	3
Statistics	STAT 450	3	Numerical Methods	MATH 353	3
Electrical Physics	PHYS 345	4	Materials Science	MASC 302	4
Dynamics	MEEG 211	3	CAD/CAM Lab	MEEG 202	3
Mech. of Solids	MEEG 215	4	Gen. Ed. Elective		3
Total		17	Total		16
Fall - Junior			Spring - Junior		
Thermal Physics	PHYS 210	3	Machine Design	MEEG 304	3
Kinematics	MEEG 301	3	Fluids II	MEEG 332	3
Vibration/Control	MEEG 311	4	Heat Transfer	MEEG 342	3
Matls. Engr.	MEEG 321	3	Thermodynamics	MEEG 344	3
Fluids I	MEEG 331	4	Thermal Lab	MEEG 346	1
			Gen. Ed. Elective		3
Total		17	Total		16
Fall - Senior			Spring - Senior		
Senior Design	MEEG 401	6	Technical Elective		3
Technical Elective		3	Technical Elective		3
Technical Elective		3	Gen. Ed. Elective		3
Gen. Ed. Elective		3	Gen. Ed. Elective		3
Total		15	Total		12
ABET Reqt. (%)	UD %	Cr	MEEG Course Legend:		
Math & Sci (25%)	29	35	100's Digit: 1=FR, 2=SO, 3=JR, 4=SR		
Engr Topics (37.5%)	54	65	Tens: 0=Design, 1=Solids, 2=Matl,		
H&SS (12.5%)	15	18	3=Fluids, 4=Thermal		
Other (0%)	2	3	Units Digit: 1=Fall, 2=Spring		
Total	100	121			

Table 2 - Catalog Revisions

DEGREE: BACHELOR OF MECHANICAL ENGINEERING									
MAJOR: MECHANICAL ENGINEERING									
OLD CURRICULUM		CREDITS		COMMENTS		NEW CURRICULUM		COMMENTS	
		YR/SEM						YR/SEM	
UNIVERSITY REQUIREMENTS					UNIVERSITY REQUIREMENTS				
ENGL 110	English	3	1S			ENGL 110	English	3	1S
Multicultural Course		(3)	1-4			Multicultural Course		(3)	1-4
COLLEGE REQUIREMENTS					COLLEGE REQUIREMENTS				
General Ed Program		18	1-4			General Ed Program		18	1-4
MAJOR REQUIREMENTS					MAJOR REQUIREMENTS				
<i>External to the College</i>					<i>External to the College</i>				
One additional Elective		3	1-4	chg to ->		STAT 450	Statistics	(3)	2F added (see Math)
Chemistry					Chemistry				
CHEM 103	Chem I	4	1F			CHEM 103	Chem I	4	1F
CHEM 104	Chem II	4	1S	deleted					
Computer and Information Sciences					Computer and Information Sciences				
CISC 106	Computing	3	2F	deleted, content moved to MEEG 101					
Mathematics					Mathematics				
MATH 241	Calculus I	4	1F	chg to pre-req		MATH 242	Calculus II	4	1F earlier
MATH 242	Calculus II	4	1S	earlier		MATH 243	Calculus III	4	1S earlier
MATH 243	Calculus III	4	2F	earlier		MATH 351	Engr. Math I	3	2F chg from MATH302
MATH 302	ODEs	3	2S	chg to MATH341		STAT 450	Statistics	3	2F add (see above)
		TOT=15cr				MATH 352	Engr. Math II	3	2S chg from MEEG361
						MATH 353	Num. Methods	3	2S add
								TOT=20cr	
Physics					Physics				
PHYS 207	Physics I	4	1S			PHYS 207	Physics I (Mech)	4	1S
PHYS 208	Physics II	4	2F	chg to PHYS345		PHYS 345	Electrical Physics	4	2F chg from MEEG208
		TOT=8cr				PHYS 210	Thermal Physics	3	3F chg from MEEG307
								TOT=11cr	
Within the College					Within the College				
MASC 302	Materials Sci	4	2S			MASC 302	Materials Sci	4	2S
EGGG 132	Graphics	2	1S	chg to MEEG202					
MECH 305	Fluids I	3	3F	chg to MEEG331					
MECH 306	Fluids Lab.	1	3F	chg to MEEG331					
ELEG 314	Circuits	4	4F	chg to PHYS345					
		TOT=14cr							
Within the Department					Within the Department				
MEEG 125	Intro to ME	0	1F	chg to 101		MEEG 101	Intro to ME	3	1F chg from 125
MEEG 213	Statics	3	2F	chg to 112		MEEG 112	Statics	3	1S was 213
MEEG 214	Dynamics	3	2S	chg to 211		MEEG 202	CAD/CAM Lab	3	2S chg from EGGG132
MEEG 302	Heat Transfer	3	3S	chg to 342		MEEG 211	Dynamics	3	2F was 214
MEEG 307	Thermo I	3	3F	chg to PHYS210		MEEG 215	Mech. of Solids	4	2F chg from 313, 391
MEEG 308	Thermo II	3	3S	chg to 344		MEEG 301	Kinematics	3	3F was 347
MEEG 313	Strength of Mats	4	2S	chg to 215		MEEG 304	Machine Design	3	3S was 348
MEEG 316	Materials Engr	3	3F	chg to 321		MEEG 311	Vibration/Control	4	3F chg from 427, 391
MEEG 336	Fluids II	3	3S	chg to 332		MEEG 321	Mats. Engr.	3	3F was 316
MEEG 347	Design I	3	3F	chg to 301		MEEG 331	Fluids I	4	3F chg from 305, 306
MEEG 348	Design II	3	3S	chg to 304		MEEG 332	Fluids II	3	3S was 336
MEEG 361	Engr. Analysis	3	3F	chg to MATH34X		MEEG 342	Heat Transfer	3	3S was 302
MEEG 391	ME Lab.	4	3S	chg to 215, 311, 346		MEEG 344	Thermodynamics	3	3S was 308
MEEG 427	System Dynamics	3	4F	chg to 311		MEEG 346	Thermal Lab	1	3S chg from 391
MEEG 447	Sr Design I	3	4F	chg to 401		MEEG 401	Product Devel	6	4F chg from 447, 448
MEEG 448	Sr Design II	3	4S	chg to 401					
		TOT=47cr						TOT=49cr	
Technical Electives					Technical Electives				
Technical Electives		12	4			Technical Electives		12	4
Total Credits		131				Total Credits		121	



DEPARTMENT OF CHEMISTRY
AND BIOCHEMISTRY
OFFICE OF THE ASSOCIATE CHAIRMAN

102 Brown Laboratory
University of Delaware
Newark, Delaware 19716-2522
Ph: 302/831-1130
Fax: 302/831-6335
E-mail: JOHN.BURMEISTER@MVS.UDEL.EDU

May 6, 1996

MEMORANDUM

TO: Professor John D. Meakin

FROM: John L. Burmeister, Alumni Distinguished Professor
and Associate Chairman

SUBJECT: Removal of CHEM-104 from the MEEG Curriculum, Spring 1998
(re: Your memo dated 4/29/96)

For the record, I predict that you will eventually follow the circular path blazed by your CHEG and ELEG peers. Six years after CHEG dropped CHEM-445/446 Physical Chemistry Laboratory from their curriculum, they have returned to the CHEM-445 fold (albeit at the expense of CHEM-120 Quantitative Chemistry). Scarcely a year has passed since ELEG dropped CHEM-103/104 from their curriculum, yet they have already initiated informal discussions directed at reintroducing some form of a required chemistry course. The problem with curriculum reform is that, while it usually makes a great deal of sense on paper, it frequently flounders in practice.

Having thus vented my spleen, I will readily attest to your right to drop CHEM-104 from your curriculum, and recognize that you have investigated the matter in some depth. We are all subject to the same increasing curricular pressures these days, due to the explosion of knowledge in all fields. Unfortunately, our user groups are neither older nor (many would say) wiser as they initiate their studies, thereby exacerbating the problem. While we would certainly prefer to have the opportunity to teach your ca. 80 freshman majors in CHEM-104, the course will manage to survive without them.

sr

cc: Dr. Theopold
Dr. Futrell



DEPARTMENT OF
ELECTRICAL ENGINEERING

140 Evans Hall
University of Delaware
Newark, Delaware 19716-3130
Ph: 302/831-2405
Fax: 302/831-4316

May 7, 1996

Professor Andras Szeri, Chair
Department of Mechanical Engineering
Campus

Dear Professor Szeri:

With respect to the proposed changes in the mechanical engineering curriculum pertaining to the removal of the ELEG 314 requirement, I have discussed this with representatives from mechanical engineering, and cannot see where it causes any problems for electrical engineering. Thus, the removal of the ELEG 314 requirement for mechanical engineering students has our support.

Regards,

A handwritten signature in black ink that reads "Neal C. Gallagher".

Neal C. Gallagher
*Charles Black Evans Professor
and Chairman*



INTERDEPARTMENTAL
MEMORANDUM

May 8, 1996

TO: Andras Z. Szeri, Chair
Mechanical Engineering

FROM: L. Pamela Cook, Chair *LP*
Mathematical Sciences

RE: ME Undergraduate Curriculum Revision

As per your request I am writing this memo to indicate that you have discussed the proposed changes of your undergraduate program with my Undergraduate Chair, Professor D. J. Hallenbeck, and myself. We are willing to work with you to institute these changes.

As you point out, your assumption that students enter prepared for Math 242 is not valid for many of your students. Thus, your program will involve extra work (Winter Session) for many students.

While Stat 450 exists, we will have to deal with extra enrollments there. The Math "341" (requires a number change), Math 34x and Math xxx are new courses we will have to work with you on developing. Your students will no longer take Math 302, Ordinary Differential Equations, in the computer classroom, hence, some of our faculty time will be released to deal with the new load. We have also spoken of the possibility of cross-teaching courses. With these items in mind we anticipate being able to accommodate your changes.



DEPARTMENT OF PHYSICS
AND ASTRONOMY

University of Delaware
Newark, Delaware 19716-2570
Ph: 302/831-2661
Fax: 302/831-1637

May 8, 1996

MEMORANDUM

TO: Andras Z. Szeri, Chair
Mechanical Engineering

FROM: Henry R. Glyde, Chair
Physics and Astronomy

RE: ME Undergraduate Curriculum Revision

Thank you for your memo dated May 7 asking me "to send you a memo expressing your willingness to cooperate with ME to institute the changes affecting your department. It would also be helpful if you could state that no major resources are required by your department to accommodate the changes." You also asked if I could get this memo to you before 4:00 pm, May 8.

The DPA is delighted to cooperate with ME. Indeed, we have already been working together to replace Physics 208 with Physics 345, Electrical Physics, a new course, for ME students. You also asked us to create a new course, Physics 210, Thermal Physics, for ME students as your memo states. We are prepared to set up these new courses and have identified professors who will teach them. These courses will increase the number of courses Physics and Astronomy teaches. At this time, at least, we are preparing to incorporate these courses into our existing workload.

HRG/lcs

cc: Dr. Mary P. Richards, Dean
College of Arts and Science

Dr. George Watson
Physics and Astronomy



COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF COMPUTER
AND INFORMATION SCIENCES

103 Smith Hall
University of Delaware
Newark, Delaware 19716-2586
Ph: 302/831-2712

To: John Meakin
Mechanical Engineering

From: Errol L. Lloyd *E.L. Lloyd*
Chair, CIS

Date: May 21, 1996

Subject: re: Change in ME undergrad requirements

Thanks for letting us know of the proposed changes in the BS degree requirements for students in Mechanical Engineering. In particular, that CISC106 will be dropped as a requirement effective the Fall 1998 semester. While we are disappointed to see this change, we understand your rationale, and with the advance notice that you have given to us, it will not cause us any problems.

Post-it® Fax Note	7671	Date	9/26	# of pages	1
To	Sue Coombes	From	V. Cherry		
Co./Dept.	Mech. Engr.	Co.	CIS		
Phone #	2421	Phone #	2711		
Fax #	3619	Fax #	8458		

Xc: DA



INTERDEPARTMENTAL
MEMORANDUM

May 30, 1996

MAY 31 1996

MECHANICAL ENG

TO: Andras Z. Szeri, Chair
Department of Mechanical Engineering

FROM: Ib A. Svendsen, Chairman *J. A. Svendsen*
Department of Civil & Environmental Engineering

SUBJECT: Mechanical Engineering Undergraduate Program

The department of Civil & Environmental Engineering Undergraduate Committee have reviewed your proposal for revision of the Mechanical Engineering Undergraduate Program. We notice that

- a) In the revised Mechanical Engineering curriculum, the Civil & Environmental Engineering Department will no longer be requested to teach the course MECH 306, Fluid Mechanics Laboratory, each fall semester to fill curriculum needs for Mechanical Engineering students.
- b) The Civil & Environmental Engineering department will not need to teach EGGG132 Engineering Graphics for Mechanical Engineering students.

The faculty had no objections to these changes. It would greatly help our planning, however, if you could let us know whether you will continue to use the Civil & Environmental Engineering Fluids Lab to teach your section of MECH 306.

The proposed reduction in credit hours will have an impact on our plans for curriculum changes because the Department of Mechanical Engineering is to some extent competing with us for students. On one side, it cannot be avoided that for well designed degree programs a reduction in the number of credit hours required for the degree represents an equivalent reduction in the amount of information it is possible to teach. On the other hand, students in a program with fewer credit hours required will graduate faster on the average. The latter is judged as becoming of increasing importance for the recruitment of students.

Apart from these comments, we want to congratulate the Mechanical Engineering department with a well thought-out plan for renewal of the Mechanical Engineering curriculum.

IAS/spj

INTERDEPARTMENTAL
MEMORANDUM

September 3, 1996

TO: Bob Hampel, Chair
University Committee on Graduate Studies

FROM: Carol Vukelich *Carol*

SUBJECT: Master of Instruction Program

Bob, last year the Department and the College approved an increase in the number of credits required in the Master of Instruction Program from 30 to 31. The one additional credit will be attached to the program's culminating activity, the preparation of a portfolio. It is my understanding that the University Graduate Committee has not considered this request. I hope this request will be considered soon by your committee. I have attached supporting documentation from the Department and College committee.

CV:mos

University
of Delaware

College of Education

Department of
Educational Studies

201 Willard Education Bldg.
Newark, DE 19716

Memorandum

To: Bill Stanley, Interim Dean, College of Education
Carol Vukelich, Coordinator, MI program

From: Dr. Charles MacArthur, ^{COM}Chair, College Committee on Graduate Studies

Date: January 23, 1996

Re: Change in MI program requirements

The College Committee on Graduate Studies in Education has approved the attached program change in the Master of Instruction program. We are requesting that Carol Vukelich prepare the course approval form for a one-credit course for portfolio construction.

cc: Bill Moody, Chair, Educational Development

The course approval
form has been
done and forwarded through
the system.



INTERDEPARTMENTAL
MEMORANDUM

DATE: December 13, 1995

TO: Charles MacArthur, Chair
College Graduate Program Committee

FROM: Jim Hiebert, Chair
Department Graduate Program Committee

SUBJECT: Request for College approval of MI Program change

The Department of Educational Development has approved the attached program change in the Master of Instruction program. We are requesting the College to approve the change and, if approved, to send it forward through appropriate University channels.

Attached is the description of the change and its rationale as prepared by Carol Vukelich, coordinator of the MI program.

cc: William B. Moody, Chair
Educational Development

Carol Vukelich, Coordinator
Master of Instruction

DATE: November 20, 1995

TO: Educational Development Faculty

FROM: Department Graduate Program Committee

Joanne Golden
Jim Hiebert, Chair
Tony Whitson
Susan Hillman

SUBJECT: Minutes of November 20 meeting

The Committee met on November 20 from 1:15-2:05pm. The following actions were taken.

1. Approved a request from Carol Vukelich to add 1 credit hour to the Master of Instruction program to be given for successful completion of the portfolio requirement. We agreed that this may help to solve several problems including a) encouraging appropriate advisement, b) documenting credit for the portfolio work (both for faculty and students), and c) simplifying tuition costs.
2. Approved a revision of EDDV 888.
3. Approved a new course, EDDV 899, pending several changes in the Course Approval Form descriptions.
4. Set a strategy for preparing a recruitment program for graduate students from minority groups. Our goal is to present a proposal to the Department in March 1996.

Our next meeting will be December 11. Please submit agenda items and supporting materials one week before the meeting.

October 19, 1995

TO: Department Graduate Program Committee
Joanne Golden
Robert Hampel
James Hiebert, Chair
Susan Hillman
Tony Whitson

FROM: Carol Vukelich *Carol*

SUBJECT: Revision in the Master of Instruction Program

The purpose of this memo is to request a change in the number of credits required in the Master of Instruction Program from 30 to 31 credits. The one additional credit would be awarded for the successful completion of the program's culminating activity, the portfolio. Students would register for this one credit during the semester in which they intend to complete their portfolios. The rationale for this requested revision is three-fold:

1. Candidates would be required to work closely with their advisors in the construction of their portfolios. Currently, advisors encourage their advisees to consult with them in the construction of their portfolios. Unfortunately, not all candidates respond to the offer. This revision would require candidates to register for an independent study credit with their advisors. Advisors could schedule times to meet with their advisee and legitimately expect the candidate to appear. An advisor with more than one candidate completing portfolios in any given semester might form a support group among his/her advisees. Advisors might work together with several candidates for group sharing. The end result should be portfolios which exhibit the highest standards of excellence and candidates who feel better advised and supervised.

2. The University has instituted a \$200 sustaining fee for master's candidates who have completed their coursework but who have not yet completed their exit requirements (e.g., thesis, comprehensive examination, portfolio). Since it is very difficult to complete the final course and simultaneously produce a portfolio, Master of Instruction candidates are guaranteed, at minimum, the necessity of paying the sustaining fee for at least one semester. At the present time, districts will reimburse Delaware teachers for credits earned toward their degree, but will not reimburse teachers the cost of the sustaining fee. Because the one credit for portfolio completion would be a degree requirement, candidates' districts would pay the tuition costs.

3. The results of a recent survey completed by a group of Master of Instruction candidates to fulfill a course requirement for Teacher as Researcher indicated that current Master of Instruction candidates do not feel that they know the expectations faculty hold for the portfolio assignment, that they have adequate faculty support for the portfolio assignment, and that they do not view the present arrangement of the optional use of their advisors for assistance in the construction of their portfolio as an adequate means of addressing their concerns. The requirement that each candidate register for a one credit course with his/her advisor would begin to rectify the concerns candidates hold regarding the completion of the of their portfolios.

Thank you for attention to this request for a revision. If it is approved, then I will prepare the course approval form for a one credit course for portfolio construction. I see the course as being graded Pass/Fail with the approval of an acceptable portfolio earning "P" grade.

CV:mos



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