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**GRADUATE COUNCIL
CURRICULUM COMMITTEE
APRIL 17, 2003**

5th Floor Conference Room, Andy Holt Tower
3:00 p.m.

Attending: Paul Frymier (Chair), Stephen Blackwell, Sherry Cable, Naima Moustaid-Moussa, Brenda Rayman, Kay Reed, Gerald Schroedl, Richard Townsend. Representatives from the colleges present were Mary L. Albrecht, College of Agricultural Sciences and Natural Resources, and Luther Wilhelm, College of Engineering.

Dr. Paul Frymier called the meeting to order at 3:00 p.m.

1. Departmental name change was presented by College of Agricultural Sciences and Natural Resources for information. The Department of Plant Sciences and Landscape Systems has changed to the Department of Plant Sciences.
2. Curricular Proposals recommended by committee for approval by Graduate Council:
 - Agricultural Sciences and Natural Resources. Add and revise cross-listed course 507 Professional Development Seminar. Add two 600-level courses that will be dual listed with two existing 500-level courses. Revise course numbers, course descriptions and credit hours. Drop one course.
 - Education, Health, and Human Sciences. Revise course credit for one course.
 - Engineering. Revise title of course and cross-listing information. Add two courses. Revise graduate curriculum to reflect addition of Textile Science in Materials Science and Engineering. Add a dual MS-MBA degree program in Nuclear Engineering. Approval of the dual MS-MBA is pending the submission of proposed Graduate Catalog text and request to add the dual degree option by the College of Business Administration.
3. A proposal for change of procedure for cross-listed courses was recommended by the committee for approval by Graduate Council.

The meeting adjourned at 4:01 p.m.

I. INFORMATIONAL ITEM:

TO:	The Graduate Council -
FROM:	Mary Lewnes Albrecht, Associate Dean, College of Agricultural Sciences and Natural Resources
RE:	Departmental Name Change

I received word today that Dr. Jack Britt, Vice President for the Institute of Agriculture, and Dr. Loren Crabtree, Vice President and Provost, approved changing the name of the Department of Plant Sciences and Landscape Systems to the Department of Plant Sciences. The former name was the temporary name chosen when the Departments of Plant & Soil Sciences and Ornamental Horticulture & Landscape Design were merged. A department head was named last fall and the department has chosen their permanent name. Department of Plant Sciences describes the overall focus of the department in teaching, research, Extension and service and is consistent with names of similar units at land-grant universities throughout the United States.

The name change becomes effective July 1, 2003.

MEMORANDUM

TO: Graduate Council

FROM: Mary Lewnes Albrecht
Associate Dean for Academic Programs
College of Agricultural Sciences and Natural Resources

DATE: February 10, 2003

RE: Graduate Curricular Changes – College of Agricultural Sciences and Natural Resources

The following curricular changes are proposed:

Department of Entomology and Plant Pathology

1. Add cross-listed course - EPP 507 Professional Development Seminar (1)
2. Add two 600-level courses (dual-list with two existing 500-level courses)
3. Revise two course descriptions
4. Revise two course description and credit hours
5. Revise course number of cross-listed course

Department of Forestry, Wildlife and Fisheries

1. Drop one course

Department of Plant Sciences and Landscape Systems

1. Revise course number of cross-listed course

COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES

Agriculture and Natural Resources

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology 507, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

ANIMAL SCIENCE

Animal Science

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology 507, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

BIOSYSTEMS ENGINEERING AND ENVIRONMENTAL SCIENCE

Biosystems Engineering

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology 507, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

Biosystems Engineering Technology

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering, Entomology and Plant Pathology, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

Environmental and Soil Sciences

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

ENTOMOLOGY AND PLANT PATHOLOGY

Entomology and Plant Pathology

ADD AND CROSS-LIST

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Environmental and Soil Sciences 507, Food Science and Technology 507, and Plant Sciences and Landscape Systems 507.) **[Primary course is Agriculture and Natural Resources 507.]**

Effective: Spring 2004

SUPPORTING INFORMATION:

- Rationale: Addition of this course allows our students to enroll in it through Entomology and Plant Pathology, and makes it more visible to our graduate student group.
- Course format and location: This course is cross-listed with ANR 507, which is the primary location.
- Impact on other academic units: None expected.
- Financial impact: No impact expected.

ADD

612 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; detection and identification of soilborne plant pathogens; biological, cultural, and chemical control. Ph.D. students only. Students who have received credit for EPP 512, may not enroll in EPP 612. Prereq: 313 or consent of instructor.

Effective: Spring 2004

SUPPORTING INFORMATION:

- Rationale: With development of the new Ph.D. concentration in Plant Pathology, it is expected that the course material offered in EPP 512 will be of interest to Ph.D. students. EPP 612 will be offered to Ph.D. students only.

- This new course will include material offered in EPP 512 (M.S. students only) and will require that Ph.D. students complete a grant proposal in USDA-CSREES-NRI format as part of the requirements for the course.
- b. Course format and location: Lecture, 3 hours per week, Ellington Plant Sciences.
 - c. Impact on other academic units: None expected.
 - d. Financial impact: No impact expected.

ADD

640 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs. Ph.D. students only.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: With development of the new umbrella Ph.D. program in the College of Agricultural Sciences and Natural Resources, a seminar course for Ph.D. students is needed. Students in 640 will be required to present detailed and in-depth analyses of current problems in entomology or plant pathology.
- b. Course format and location: One credit-hour oral presentation with appropriate visual aids.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

REVISE DESCRIPTION

From

512 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; biological, cultural, and chemical control. Prereq: 313 or consent of instructor.

To

512 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; detection and identification of soilborne plant pathogens; biological, cultural, and chemical control. M.S. students only. Students who receive credit for EPP 612, may not enroll in EPP 512. Prereq: 313 or consent of instructor.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: A new course will be added (EPP 612) specifically for Ph.D. students. EPP 512 and EPP 612 will be taught simultaneously, but there will be more requirements for the Ph.D. students.
- b. Course format and location: Lecture, 3 hours per week, Ellington Plant Sciences.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

From

540 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs.

To

540 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs. M.S. students only.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: With development of the new umbrella Ph.D. program in the College of Agricultural Sciences and Natural Resources, separate seminar courses are needed for M.S. and Ph.D. students.
- b. Course format and location: One credit-hour oral presentation with appropriate visual aids.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

REVISE DESCRIPTION AND CREDIT HOURS

From

514 Bacterial Plant Diseases (4) Morphology, taxonomy, ecology, physiology, and genetics of bacterial plant pathogens; infection and disease development, pathogenesis and resistance; diagnosis, detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 3 hrs and 1 lab.

To

514 Bacterial Plant Diseases (2) Morphology, taxonomy, ecology, physiology, and genetics of bacterial plant pathogens; infection and disease development, pathogenesis and resistance; diagnosis, detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 3 hrs and 1 lab for 7 weeks.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Department is reducing credit hours on some core courses in order to provide more flexibility to graduate students for electives.
- b. Course format and location: three lectures and one lab per week for seven weeks.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

From

520 Plant Parasitic Nematodes (4) Morphology, physiology, taxonomy, ecology, and management of phytoparasitic nematodes, host-parasite relationships. Prereq: 6 hrs biological science or consent of instructor. 2 hrs and 2 labs.

To

520 Plant Parasitic Nematodes (2) Morphology, physiology, taxonomy, ecology, and management of phytoparasitic nematodes, host-parasite relationships. Prereq: 6 hrs biological science or consent of instructor. 2 hrs and 2 labs weekly for 7 weeks.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Department is reducing credit hours on some core courses in order to provide more flexibility to graduate students for electives.
- b. Course format and location: two lectures and two labs per week for seven weeks.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

REVISE COURSE NUMBER (cross-listed course)

From

543 DNA Analysis (2) (Same as Plant Sciences and Landscape Systems 543.) **[Primary course is Entomology and Plant Pathology 543.]**

To

643 DNA Analysis (2) (Same as Plant Science and Landscape Systems 643.) **[Primary course is Entomology and Plant Pathology 643.]**

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Institution of an umbrella Ph.D. program covering three departments in the College of Agricultural Sciences and Natural Resources enables the instructor to offer a more intensive course at the Ph.D. level. This is the primary department.

- b. Course format and location: One hour lecture, four lab weekly for seven weeks. Course will be taught in Plant Biotechnology Building.
- c. Impact on other academic units: Department of Plant Sciences that cross-lists this course. See below.
- d. Financial impact: No impact expected.

FOOD SCIENCE AND TECHNOLOGY

Food Science and Technology

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1) (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology 507, Environmental and Soil Sciences 507, and Plant Sciences and Landscape Systems 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- Primary course is Agriculture and Natural Resources 507
- See Entomology and Plant Pathology 507 (Add and Cross-list)

FORESTRY, WILDLIFE AND FISHERIES

Wildlife and Fisheries Science

DROP (for graduate credit)

490 Ethics in Wildlife and Fisheries Management (1)

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Material is integrated into other courses.
- b. Course format and location: NA
- c. Impact on other academic units: None
- d. Financial impact: None.

PLANT SCIENCES

Plant Sciences and Landscape Systems

REVISE COURSE NUMBER (cross-listed course)

From

543 DNA Analysis (2) (Same as Entomology and Plant Pathology 543.) [Primary course is Entomology and Plant Pathology 543.]

To

643 DNA Analysis (2) (Same as Entomology and Plant Pathology 643.) [Primary course is Entomology and Plant Pathology 643.]

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Entomology and Plant Pathology is the primary department. They requested this change.
- b. Course format and location: One hour lecture, four lab weekly for seven weeks. Course will be taught in Plant Biotechnology Building.
- c. Impact on other academic units: None expected.
- d. Financial impact: No impact expected.

REVISE CROSS-LISTING (to add Entomology and Plant Pathology 507)

507 Professional Development Seminar (1). (Same as Agriculture and Natural Resources 507, Animal Science 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Entomology and Plant Pathology 507, Environmental and Soil Sciences 507, Food Science and Technology 507.)

Effective: Spring 2004

SUPPORTING INFORMATION:

- **Primary course is Agriculture and Natural Resources 507**
- See Entomology and Plant Pathology 507 (Add and Cross-list)

Memo

To: Graduate Council

From: Tom George

Date: 4/22/2003

Re: Item for the Graduate Council Agenda

Attached please find a request to revise the number of credit hours of CS 590, which was recently approved by our College's Curriculum Review Committee. The need to expand course content warrants the increased credit, and no financial impact is expected. We are requesting that the item be placed on the agenda for the next Graduate Council meeting.

COLLEGE OF EDUCATION, HEALTH, AND HUMAN SCIENCES

INSTRUCTIONAL TECHNOLOGY AND EDUCATIONAL STUDIES

Cultural Studies in Education

REVISE CREDIT HOURS

590 Cultural Studies Seminar (2) (Formerly 1 credit hour)

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Expanded course content warrants increased credit.
- b. Financial Impact: None

MEMORANDUM

To: Undergraduate Council

From: Luther Wilhelm

Subject: College of Engineering Graduate Curricula Changes for Spring 2003

Date: April 7, 2003

The attached curricular proposals have been approved by the faculty of the College of Engineering and are submitted to the Graduate Council for consideration. The following is a summary of these proposals:

Chemical Engineering

Revise title of one course, and change corresponding cross-listed courses in Environmental Engineering and Engineering Science.

Electrical and Computer Engineering

Add one course.

Materials Science and Engineering

Revise graduate curriculum to reflect addition of textile science
Add one course.

Nuclear Engineering

Add a dual MS-MBA degree program.
Add cross-listing of two graduate courses. (Cross-listed with Industrial Engineering and Mechanical Engineering.)
Change repeat statement for one course.

COLLEGE OF ENGINEERING

CHEMICAL ENGINEERING

Chemical Engineering

REVISE TITLE (cross-listed course)

581 Green Engineering (3) (Same as Environmental Engineering 581 and Engineering Science 585) (Formerly: Industrial Pollution Prevention) **[Primary course is Chemical Engineering 581]**

Effective: Spring 2004

SUPPORTING INFORMATION

- a. Rationale- The field of industrial pollution prevention has expanded to include areas not traditionally covered in the area. The term "Green Engineering" is one commonly adopted by newer textbooks and by funding agencies to describe this broader activity. The name is one that we hope will be more familiar to new students in the field. (Chemical Engineering is the home department.)
- b. Course format and location- no changes
- c. Impact on other academic units- the course is cross-listed in Environmental Engineering and Engineering Science and letters of approval by these units are provided.
- d. Financial Impact- none

CIVIL AND ENVIRONMENTAL ENGINEERING

Environmental Engineering

REVISE TITLE (cross-listed course)

581 Green Engineering (3) (Same as Chemical Engineering 581 and Engineering Science 585) (Formerly: Industrial Pollution Prevention) **[Primary course is Chemical Engineering 581]**

Effective: Spring 2004

SUPPORTING INFORMATION

- a. Rationale- Name change was approved for Chemical Engineering 581.
- b. Financial Impact- none

ELECTRICAL AND COMPUTER ENGINEERING

Electrical and Computer Engineering

ADD

642 Wireless Communications (3) Fundamental theory and design of wireless communications systems; mobile radio propagation; modulation techniques; coding, diversity and equalization. Wireless systems and standards. Prereq: Satisfactory Completion of ECE441 and ECE504.

Effective: Spring 2004

SUPPORTING INFORMATION

- a. Rationale: This course has been offered in Spring semesters of 2001, 2002, and 2003 as a special topics course with an average enrollment of 11-12 students.
- b. Impact on other academic units: none

INDUSTRIAL ENGINEERING

Industrial Engineering

REVISE CROSS-LISTING (to add Nuclear Engineering 509) [**Primary course is Industrial Engineering 509**]

IE 509 Multidisciplinary Project (1) (Same as Mechanical Engineering 509 and Nuclear Engineering 509)

REVISE CROSS-LISTING (to add Nuclear Engineering 594) [**Primary course is Mechanical Engineering 594**]

IE 594 Culminating Integrated Project Report (3) (Same as Mechanical Engineering 594 and Nuclear Engineering 594)

Effective: Spring 2004

Supporting Information for both:

- a. Rationale: Part of the dual-degree program
- b. Course format and location: No change
- c. Impact on other academic units: MABE department, Nuclear Engineering, and College of Business as part of the dual-degree program
- d. Financial Impact: None

MATERIALS SCIENCE AND ENGINEERING

REVISE THE LIST OF CONCENTRATIONS AVAILABLE IN MATERIALS SCIENCE AND ENGINEERING

Graduate Majors and Degrees Chart - *Graduate Catalog*

From

MS & PHD-materials, metallurgy, polymers.

To

MS & PHD-materials, metallurgy, polymers, textiles.

Effective: Fall 2004

REVISE THE LIST OF CONCENTRATIONS AVAILABLE IN POLYMER ENGINEERING

Graduate Majors and Degrees Chart – *Graduate Catalog*

From

MS & PHD-composite materials; mechanical, physical & chemical behavior of polymers; polymer morphology; rheology & polymer processing.

To

MS & PHD-polymer processing, polymer science, textile science.

Effective: Fall 2004

REVISE THE GRADUATE PROGRAM REQUIREMENTS IN MATERIALS SCIENCE AND ENGINEERING

From

Graduate programs are offered leading to the degrees of Masters of Science and Doctor of Philosophy in Materials Science and Engineering or Polymer Engineering. Both the Materials Science and Engineering and Polymer Engineering programs are flexible and interdisciplinary in nature. Students may be admitted from a wide range of disciplines; these include physics, chemistry, chemical engineering, mechanical engineering, electrical engineering, materials engineering, and engineering science programs.

Areas of concentration within the Materials Science and Engineering degree program include metallurgy, polymers, and materials. Specializations include, but are not limited to: ceramics; composites; electronic materials; physical metallurgy; materials processing; welding metallurgy and materials joining; corrosion science and engineering; biomedical materials; and mechanical and physical behaviors of materials.

Areas of concentration within the Polymer Engineering degree program include rheology and polymer processing; polymer morphology; mechanical, physical and chemical behavior of polymers; and composite materials.

THE MASTER'S PROGRAM

Thesis Option

A total of 30 semester hours is required for the M.S. degree in either Materials Science and Engineering or Polymer Engineering. Additional requirements include:

1. A major consisting of 12 semester hours of graduate courses in materials science and engineering or polymer engineering. The materials science and engineering major must include 511, 512, 515, and 516 for the metallurgy concentration; 511, 512, 540, and 541 for the polymers concentration; and 511, 512, and two graduate specialization courses approved by the student's faculty committee for the materials concentration. The polymer engineering major must include 540, 541, 543, 546, 549, and 550 unless similar material has been covered in prior coursework.
2. Additional courses up to 12 hours total in related areas.
3. Master's thesis, 500, totaling 6 to 12 hours.
4. Satisfactory performance on a comprehensive oral examination administered by the faculty committee.

All resident students are required to register for and participate in the graduate seminar in materials science and engineering or polymer engineering, as appropriate, during each semester in which it is offered. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements.

Non-Thesis Option

Any candidate may apply for a non-thesis option. Upon acceptance, a supervisory committee of three will be appointed. At least two members of the committee will be from the faculty in the major area, either materials science and engineering or polymer engineering. The requirements for completion of the non-thesis option are as follows:

1. Completion of a total of 30 hours of graduate coursework. At least 18 of those hours must be in the department, and up to 12 hours may be in related areas. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. The materials science and engineering major and the polymer engineering major must include the same courses required for the thesis option. The candidate's degree program must be approved by the faculty committee.
2. Satisfactory completion of a culminating experience such as MSE 580 (Critical Review).
3. Satisfactory performance on a comprehensive examination administered by the faculty committee.

THE DOCTORAL PROGRAM

After one year in residence and with the approval of the faculty, a student may proceed directly to the doctoral program without completion of a master's degree. Departmental requirements for completion of the doctoral degree are:

1. a. For students proceeding directly to the Ph.D. from the baccalaureate degree: 48 graduate course credit hours with at least six hours of 600-level courses. Six hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 30 credit hours must be courses taught in the department. The materials science and engineering major and the polymer engineering major must include the courses required for the master's program.
b. For students having a master's degree in Materials Science and Engineering, Polymer Engineering, or Metallurgical Engineering: 18 additional graduate course credits with at least six hours of 600-level courses. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 12 credit hours must be courses in the department.
2. Students must complete at least 24 hours of dissertation credits.

3. Satisfactory performance on a comprehensive examination, usually given in two parts, and covering such topics as materials science and engineering, metallurgical or polymer engineering operations and processes, thermodynamics, technology, mathematics, physics, chemistry, and other related fields.

4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.

To

Graduate programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in Materials Science and Engineering or Polymer Engineering. Both the Materials Science and Engineering and Polymer Engineering programs are flexible and interdisciplinary in nature. Students may be admitted from a wide range of disciplines; these include physics, chemistry, chemical engineering, mechanical engineering, electrical engineering, materials engineering, and engineering science programs.

Areas of concentration within the Materials Science and Engineering degree program include metallurgy, polymers, textiles, and materials. Specializations include, but are not limited to: ceramics; composites; electronic materials; physical metallurgy; materials processing; welding metallurgy and materials joining; corrosion science and engineering; biomedical materials; nonwovens science and technology; and mechanical and physical behaviors of materials.

Areas of concentration within the Polymer Engineering degree program are polymer processing, polymer science, and textile science. Specialty areas include rheology; polymer morphology; mechanical, physical, and chemical behaviors of polymers; composite materials; and nonwovens science and technology.

THE MASTER'S PROGRAM

Thesis Option

A total of 30 semester hours is required for the M.S. degree in either Materials Science and Engineering or Polymer Engineering. Additional requirements include:

1. A major consisting of 12 semester hours of graduate courses in materials science and engineering or polymer engineering. The materials science and engineering major must include 511, 512, 515, and 516 for the metallurgy concentration; 511, 512, 540, and 541 for the polymers concentration; 511, 512, 540, 552, and 553 for the textiles concentration; and 511, 512, and two graduate specialization courses approved by the student's faculty committee for the materials concentration. The polymer engineering major must include 540, 541, 543, 546, 549, and 550 for the polymer processing and polymer science concentrations; and 540, 541 or 543, 549, 550, 552, and 553 for the textile science concentration; exceptions are given if similar material has been covered in prior coursework.

2. Additional courses up to 12 hours total in related areas.

3. Master's thesis, 500, totaling 6 to 12 hours.

4. Satisfactory performance on a comprehensive oral examination administered by the faculty committee.

All resident students are required to register for and participate in the graduate seminar in materials science and engineering or polymer engineering, as appropriate, during each semester in which it is offered. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements.

Non-Thesis Option

Any candidate may apply for a non-thesis option. Upon acceptance, a supervisory committee of three will be appointed. At least two members of the committee will be from the faculty in the major area, either materials science and engineering or polymer engineering. The requirements for completion of the non-thesis option are as follows:

1. Completion of a total of 30 hours of graduate coursework. At least 18 of those hours must be in the department, and up to 12 hours may be in related areas. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. The materials science and engineering major and the polymer engineering major must include the same courses required for the thesis option. The candidate's degree program must be approved by the faculty committee.

2. Satisfactory completion of a culminating experience such as MSE 580 (Critical Review).

3. Satisfactory performance on a comprehensive examination administered by the faculty committee.

THE DOCTORAL PROGRAM

After one year in residence and with the approval of the faculty, a student may proceed directly to the doctoral program without completion of a master's degree. Departmental requirements for completion of the doctoral degree are:

1. a. For students proceeding directly to the Ph.D. from the baccalaureate degree: 48 graduate course credit hours with at least six hours of 600-level courses. Six hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 30 credit hours must be courses taught in the department. The materials science and engineering major and the polymer engineering major must include the courses required for the master's program. In addition, for students in the textile science concentration of the polymer engineering major, the courses must include 541 and 543.

b. For students having a master's degree in Materials Science and Engineering, Polymer Engineering, or Metallurgical Engineering: 18 additional graduate course credits with at least six hours of 600-level courses. Three hours of MSE 503 or 504, Seminar, graded Satisfactory/No Credit, may be counted toward degree requirements. At least 12 credit hours must be courses in the department.

2. Students must complete at least 24 hours of dissertation credits.

3. Satisfactory performance on the applicable comprehensive examination.

4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.

Effective: Fall 2004

SUPPORTING INFORMATION:

- a. Rationale: The changes in requirements for the Materials Science and Engineering and Polymer Engineering graduate degree programs are due to the transfer of the Textile Science program from the Department of Consumer and Industry Services Management, College of Human Ecology, to the Department of Materials Science and Engineering, College of Engineering. A concentration in textiles is added to the M.S. and Ph.D. degree programs in Materials Science and Engineering, and a concentration in textile science is added to the M.S. and Ph.D. degree programs in Polymer Engineering.
- b. Course format and location: Not applicable.
- c. Impact on other academic units: The changes reflect the deletion of the Textile Science program from the Department of Consumer and Industry Services Management, College of Human Ecology.
- d. Financial impact: None.

Materials Science and Engineering

ADD

545 Polymer Engineering Processing and Characterization Laboratory (3) Polymer film casting, film blowing, mixing and extrusion are operated and studied. Flow rates, temperatures, pressures and velocity profiles are acquired and used in finite element modeling and simulation to correlate the polymeric material properties and morphology. Supporting instrumentation includes linear viscoelastic rheometry, capillary viscometry, SEM, OM, FTIR, etc. Fundamentals of processing-structure-property relationships are documented in a literature review paper. Preq. Consent of instructor.

Effective: Spring 2004**SUPPORTING INFORMATION:**

- a. Rationale: This new graduate course is added to the Materials Science and Engineering curriculum to enhance the laboratory knowledge and skills of engineering graduate students in polymer processing and characterization.
- b. Course format and location: Laboratory format, on-campus.
- c. Impact on other academic units: This new course also may serve as an elective course for engineering and science graduate students interested in polymer science and engineering.
- d. Financial impact: None. This course is team-taught by three faculty members and has been taught for three semesters under MSE 576 Special Topics. The equipment for this laboratory was purchased with funds provided by the Dean of Engineering and the development of a new laboratory course was a requirement for the funding. The MSE department has dropped several courses in recent years and has also added new faculty.

MECHANICAL, AEROSPACE, AND BIOMEDICAL ENGINEERING**Engineering Science**

REVISE TITLE (cross-listed course) [Primary course is Chemical Engineering 581]

ES 585 Green Engineering (3) (Same as Chemical Engineering 581 and Environmental Engineering 581) (Formerly: Industrial Pollution Prevention)

Effective: Spring 2004**SUPPORTING INFORMATION:**

- a. Rationale: Chemical Engineering, home department, desires change
- b. Course format and location: No change
- c. Impact on other academic units: Chemical Engineering has requested this change and this department concurs
- d. Financial impact: None

Mechanical Engineering

REVISE CROSS-LISTING (to add Nuclear Engineering 594) [Primary course is Mechanical Engineering 594]

ME 594 Culminating Integrated Project Report (3) (Same as Industrial Engineering 594 and Nuclear Engineering 594).

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Nuclear Engineering has requested cross-listing
- b. Course format and location: No change
- c. Impact on other academic units: Cross-listing benefits Dual Degree Program
- d. Financial impact: None

REVISE CROSS-LISTING (to add Nuclear Engineering 509) [Primary course is Industrial Engineering 509]

ME 509 Multidisciplinary Project (1) (Same as Industrial Engineering 509 and Nuclear Engineering 509)

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Nuclear Engineering has requested cross-listing.
- b. Course format and location: No change
- c. Impact on other academic units: Cross-listing benefits Dual Degree Program
- d. Financial impact: None

NUCLEAR ENGINEERING

Revise Graduate Majors and Degree Programs Chart - *Graduate Catalog*

From

Nuclear Engineering - M.S., Ph.D.

MS- radiological engineering. Certificate program in maintenance and reliability engineering and in nuclear criticality safety also available.

To

Nuclear Engineering - M.S., Ph.D.

MS & Ph.D.- radiological engineering. Dual **MS-MBA** Program available. Certificate program in maintenance and reliability engineering, and in nuclear criticality safety also available.

SUPPORTING INFORMATION:

- a. Rationale: Nuclear Engineering has been graduating doctoral students specializing in Radiological Engineering for several years. Radiological Engineering is a specialization within Nuclear Engineering. This change in the *Graduate Catalog* merely reflects what we are already doing.
- b. Course format and location: No change
- c. Impact on other academic units: None
- d. Financial impact: None

Effective: Fall 2004

ADD DUAL DEGREE OPTION

Add a dual degree program of M.S.-MBA with a major in Nuclear Engineering and in Business Administration at the end of the Master's Program description in the *Graduate Catalog*.

DUAL M.S.-MBA PROGRAM

The College of Business Administration and the College of Engineering offer an integrated program in product development and manufacturing leading to the conferral of the Master of Business Administration degree and the Master of Science degree with a major in Nuclear Engineering. The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate an increasingly complex body of knowledge for rapid introduction of new products to the marketplace. The objective of the dual degree program is to prepare graduates to take a leading management role in

companies that must react quickly to a dynamic market where forces of competition require rapid changes in design and manufacturing and a short product development cycle.

Admission Requirements

Applications are accepted for fall semester only. Applicants for the M.S.-MBA program must make separate application to, and be competitively and independently accepted by the Office of Graduate Admissions for the Master of Business Administration degree program and the Master of Science degree program with a major in Nuclear Engineering, and by the Dual Program Committee.

Students will initially apply for the MBA program, indicating on their application the intent to pursue the dual M.S.-MBA program and the appropriate engineering major (refer to the MBA program for separate instructions). Students accepted for both the MBA and the M.S. with a major in Nuclear Engineering program will be assigned to a Dual Program Committee advisor (a faculty member in Nuclear Engineering) who will be responsible for course approval and overall supervision of the students' progress through the dual program.

Applications by U.S. citizens and permanent residents received after the MBA application deadline (March 1) will be considered as space allows. Additional information is required and different application dates are established by The Graduate School for international students.

Curriculum

All engineering students enrolled in the product development and manufacturing program must complete common coursework designed to provide them with an integrated, multidisciplinary teamwork experience. The MBA curriculum in product development and manufacturing consists of 33 hours of common coursework in the College of Business Administration and 15 hours of common coursework in the College of Engineering. Engineering common coursework includes a culminating 3-hour integrated project course requiring a comprehensive report, and a final examination as required by the Dual Program Committee, to be taken during the first session of summer following the second year.

During the second year, dual degree candidates will also take courses in their engineering major. The coursework is designed to provide students with a concentration in their major and advanced skills to accomplish their teamwork assignments. Dual degree candidates enrolled in nuclear engineering are required to take 18 hours of graduate-level nuclear engineering courses during the second year of the program, which must be approved by the student's Dual Program Committee Advisor. In addition, a dual degree candidate who majors in nuclear engineering must successfully defend, in an oral examination administered by at least three nuclear engineering faculty members including the student's Dual Program Committee Advisor, all work presented for the M.S. degree—all coursework and the culminating integrated project.

Program Curriculum for Dual M.S.-MBA Degree – Major in Nuclear Engineering

August - First Year

BA 511	MBA Core I	3
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Fall - First Year

BA 512	MBA Core II	15
ME 504	Product Development Process	1

Spring

BA 513	MBA Core III	9
ME 506	Product Selection and Evaluation	2
ME 508	Integrated Product, Process, and Manufacturing System Design	3

Summer

---	Internship	--
BA 514	Integrated Business Simulation	3
NE 509	Project Management	1

Fall - Second Year

IE 511	Business Planning and Commercialization	3
NE 509	Project Management	1
---	Nuclear Engineering courses	9

Spring

---	MBA "hub" course elective	3
NE 509	Project Management	1
---	Nuclear Engineering courses	9

Summer (first session)

NE 594	Culminating Integrated Project Report	3
TOTAL		66

The dual degree candidate must satisfy the curriculum and graduation requirements of the engineering major being pursued and the College of Business Administration. Students withdrawing from the dual degree program before completing both

degrees will not receive credit toward graduation in either degree program for courses taken in the other degree program, except as such courses qualify for credit without regard to the dual degree program. The M.S. and the MBA degrees will be awarded upon successful completion of the requirements of the dual program.

Approval Dual Credit

A maximum of 15 semester hours of the common program courses completed in the College of Engineering may be counted toward the MBA degree program.

Effective: Fall 2004

Nuclear Engineering

ADD AND CROSS-LIST **[Primary course is Industrial Engineering 509]**

NE 509 Multidisciplinary Project (1) (Same as Industrial Engineering 509 and Mechanical Engineering 509.)

ADD AND CROSS-LIST **[Primary course is Mechanical Engineering 594]**

NE 594 Culminating Integrated Project Report (3) (Same as Industrial Engineering 594 and Mechanical Engineering 594.)

Effective: Spring 2004

SUPPORTING INFORMATION FOR BOTH:

- a. Rationale: Combining business knowledge with graduate engineering knowledge is becoming increasingly important in the marketplace for engineering graduates, including nuclear engineering graduates. The dual MS/MBA Program is a response to this market need. The nuclear engineering component of the dual program mirrors the already existing dual programs in Industrial Engineering and Mechanical Engineering.
- b. Course format and location: No change
- c. Impact on other academic units: Cross-listing benefits Dual Degree Program
- d. Financial impact: None

ADD REPEAT STATEMENT

From

697 Special Topics in Nuclear Engineering (3) Investigation of new developments. Prereq: Consent of Instructor.

To

697 Special Topics in Nuclear Engineering (3) Investigation of new developments. Prereq: Consent of Instructor. May be repeated with consent of department.

Effective: Spring 2004

SUPPORTING INFORMATION:

- a. Rationale: Totally different special topics can be addressed in this course from semester to semester. Hence, a student should be permitted to repeat the course with the consent of the department.
- b. Course format and location: No change
- c. Impact on other academic units: None
- d. Financial impact: None

Format Change for Curriculum Proposals Submitted for Cross-listed Courses

Beginning with proposals submitted to the Graduate Curriculum Committee for the September 25th, 2003 meeting, most curriculum proposals for cross-listed courses need only have a single formal proposal submitted from the unit initiating the change. From other units whose catalog material is only impacted by modifications to course descriptions (such as course name changes, hours of credit, additions to the list of other cross-listing units, etc.), all that is required is a letter from the unit head of the impacted department indicating that their faculty are aware of and approve of the proposal. The letters are to be submitted by the unit submitting the proposal as supporting documentation for their proposal. The letters can be in the form of written correspondence or email. It is the obligation of the initiating unit to obtain these supporting letters. These letters should be submitted as a portion of the curricular material and should therefore be submitted electronically (copied/pasted or scanned into the material). If a proposal requires changes in the catalog text of an impacted unit other than modifications of course descriptions, a parallel proposal will still need to be submitted by the impacted unit as well as the initiating unit. If a new course is being added to one unit and cross-listed in others, this would also require proposals from each cross-listing unit.

For example, the Physics and Astronomy Department is the home department of the course Physics 571: “Mathematical Methods in Physics” and the course is cross-listed in the Mathematics Department as Mathematics 571 by the same title.

If the Mathematics department decided it no longer wanted to give mathematics credit for the course, they would file a proposal to drop the cross-listing with a letter from the unit head of Physics and Astronomy stating that the Physics and Astronomy faculty were aware of the proposal and that their faculty had approved the dropping of the cross-listing in Mathematics. The Physics and Astronomy Department would not need to submit a parallel proposal if the only change was to remove the cross-listing from the course description of Physics 571. Conversely, if the Physics and Astronomy Department wanted to add a recitation period to the course and change the credit hours of the course from 3 to 4, they would submit a proposal to do so and accompany this with a letter from the unit head of the Mathematics Department stating that the Mathematics faculty were aware of the changes and approved of them. If the Mathematics faculty did not approve of the change, they would either work with the Physics and Astronomy to reach a suitable solution or submit a proposal to drop the cross-listing.

If the Physics and Astronomy Department wanted to change the name of the course to “Advanced Mathematical Methods in Quantum Physics” and the Mathematics Department had included the explicit name of the course in a program description (as a required course for an MS degree for example), the Mathematics Department would need to submit a proposal outlining the changes to their program at the same time that the Physics and Astronomy Department submitted its proposal to change the name of the course. Also, if the Physics and Astronomy Department wanted to add a new course “Advanced Mathematical Methods in Astrophysics” and Mathematics wanted to cross-list the course simultaneously, the Mathematics Department would need to submit a proposal adding the course and noting it as cross-listed as well as the Physics and Astronomy Department. If the course “Advanced Mathematical Methods in Astrophysics” was an existing course, then only the Mathematics Department would need to submit a proposal, accompanied by a letter from the unit head of the Physics and Astronomy Department indicating that the Physics and Astronomy faculty approved of the proposal.

The objective of this proposed change is to simplify the process of submitting changes to cross-listed courses and the addition of existing cross-listed courses to additional units. At the same time, it is necessary to maintain a clear record of changes to all impacted courses so that catalog modifications can be made in a uniform manner. The “Guidelines for Submission of Curricular Materials to the Graduate Council” do not require significant changes because modifications to cross-listed courses (with the exception of the addition of new courses) are not explicitly covered. Note however that the statement of impacted courses will in the future explicitly require a list of all cross-listed courses for proposals dealing with changes to these courses so the necessary catalog changes can be easily tracked by the catalog editor.

Change “Guidelines for Submission of Curricular Materials to the Graduate Council”

From:

Impact on other academic units. (Does the proposed change delete or alter courses required by other programs?

Does the proposed change require courses offered by other programs?)

GUIDELINES FOR SUBMISSION OF MATERIALS TO THE GRADUATE COUNCIL

The dean or designee of each college should submit a:

- I. Cover Letter. (See EXAMPLE I on page 3.)
- II. Narrative Summary of curricular proposals using the format in which the material is to appear in the catalog. The narrative summary (see EXAMPLE II on page 2) should include the following information for each curricular change:
 - Action to be taken. (See *Curricular Actions* on pages 10-13.)
 - Items required. (Each curricular action requires specific information. See *Curricular Actions* on pages 10-13.)
 - Rationale. (Why the curricular revision is needed.)
 - Course format and location. (If a course is offered off-campus, this should be indicated here. Courses offered in non-standard format or as electronically-mediated courses must be submitted using the appropriate forms – See IV below.)
 - Impact on other academic units. (Does the proposed change delete or alter courses required by other programs? Does the proposed change require courses offered by other programs?)
 - Financial impact. (Does the course require additional resources or workload for faculty?)
- III. Equivalency Table. When course numbers change or courses are moved from one college/program/unit/department/academic discipline, etc. to another, the Office of the University Registrar requires an Equivalency (course conversion) Table listing current courses and the proposed equivalent courses. In order to make this information readily available, the Equivalency Table must be submitted as a part of the curricular changes and will be included in the Curriculum Committee Agenda, as well as the Graduate Council Minutes. (See EXAMPLE III on page 4.)
- IV. Request for Approval of Non-Standard Format and Electronically-Mediated Courses.
 - If current courses are to be taught in a non-standard or electronically-mediated format the appropriate form (see pages 5-9) should be submitted, Current courses should be submitted for approval as the final items.

To:

Impact on other academic units. (Does the proposed change delete or alter courses required by other programs? Does the proposed change require courses offered by other programs? If the desired action involves a course cross-listed in other units, provide a list of all cross-listed courses.)

GUIDELINES FOR SUBMISSION OF MATERIALS TO THE GRADUATE COUNCIL

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