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## Proposal to the Senate Educational Policy Committee

**PROPOSAL TITLE:** Establish a New Major in Materials Engineering in the Department of Materials Science and Engineering (MatSE), College of Engineering for the degree of Master of Engineering

**SPONSOR:** *Professor Emeritus Phillip H. Geil, 333-0149, geil@illinois.edu*

**COLLEGE CONTACT:** *Victoria L. Coverstone, Associate Dean, Office of Graduate and Professional Programs, College of Engineering, 333-0678, vcc@illinois.edu*

**BRIEF DESCRIPTION:** This proposal is meant to accompany the proposal for the Master of Engineering and seeks establishment of a major in Materials Engineering in the Master of Engineering (M.Eng.) degree. Students would need to take a total of 36 hours for the major. A minimum of two semesters (or equivalent, a minimum of 30 weeks) of industrial co-op or internship during their B.S. program and/or the M.Eng. program are required. The proposed degree is different from a traditional master's degree in that it has different goals, no thesis is required and it is a terminal Professional degree and not a pathway to the doctoral program. Students unable to obtain the required internships would be expected to transfer to the non-thesis (or thesis) MatSE M.S program. Further details of the requirements for the proposed degree and the current requirements for a traditional MatSE M.S. degree are given in Appendices I and II, respectively.

**JUSTIFICATION:** For students in Engineering, in general, and materials science and engineering in particular, the expansion of knowledge needed for employment in many industries has increased beyond what can be covered within the current credit-hour-limited B.S. degree. Furthermore, the engineer of tomorrow must have strong communication skills, both oral and written, and at the same time have excellent interpersonal skills as well as cognizance of societal, economic, and political issues on a global level. The major in Materials Engineering in the M.Eng. degree proposed herein will provide students with the opportunity to broaden their materials knowledge base, improve communication skills, obtain a foundation in business, technology management, and entrepreneurship, and gain practical engineering experience. In particular, two semester long internships (or equivalent, one may be during the student's B.S. program) are required. The purpose of the internships is to have the student gain practical experience in various aspects of Materials Engineering such as processing, design, modeling, product development, sales-service and/or engineering research. In addition the students are expected to complete at least 10 hours of courses in the areas of business, technology management and/or entrepreneurship from an accepted list, with the possibility of obtaining a graduate certificate from the Technology Entrepreneur Center (See attached list in Appendix III).

Program Assessment: The major in Materials Engineering in the Master of Engineering degree will be reviewed by the Curriculum Committee of the MatSE Department on a three to five year basis as deemed appropriate by said committee following an initial annual review for the first 3 years. The committee evaluation will include student enrollment, course availability, and internship placement. It will also be reviewed by the College of Engineering Executive Committee according to their assessment schedule.

**BUDGETARY AND STAFF IMPLICATIONS:**


- a. *Additional staff and dollars needed:* Enrollment of non-UIUC BS students is expected to be minimal, a few per year. The degree is primarily designed for a proposed combined B.S.-M.Eng. student already enrolled at UIUC, with 5-10 such students expected per year. Being a Professional degree, tuition funds returned to the departments should cover nearly all, if not all of the cost of adding such students to current classes.
- b. *Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.):* With a total graduate student enrollment of 165 in MatSE, the anticipated small number of students expected for the M.Eng. degree will not increase class sizes to an extent that additional sections will be needed. Most MatSE senior and graduate level specialization courses have enrollments of about 20 so adding these additional students will not have a negative impact on the quality of education provided.
- c. *Effect on course enrollment in other units and explanations of discussions with representatives of those departments:* This is also expected to be insignificant, equivalent to adding a few more graduate students to our current programs. The largest impact might be on courses related to business, technology management, and entrepreneurship in various departments the College of Engineering, with courses being possible in the Department of Industrial and Enterprise Engineering and the Technology Entrepreneur Center. Even though MatSE currently participates with the M.B.A. Program in a joint M.S.-M.B.A. degree for which the M.B.A. program indicated acceptance of the possible added enrollment, the College of Business denied our request for a letter of concurrence for our M.Eng. students to take their courses in business or business administration.
- d. *Impact on the University Library:* Minimal. (See attached letter)
- e. *Impact on computer use, laboratory use, equipment, etc.:* M.Eng. students coming from other programs than the Illinois MatSE program might take some of our “Senior Lab” courses, but the impact on research labs would be non-existent since completing a thesis is not an option.

**DESIRED EFFECTIVE DATE:** Fall, 2013

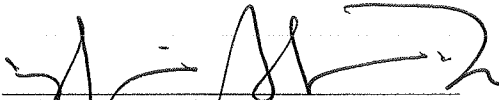
**STATEMENT FOR PROGRAMS OF STUDY CATALOG:** See Appendix I

CLEARANCES


Signatures:

  
Unit Representative:

12-5-11  
Date:

  
College Representative:

1/9/12  
Date:

  
Graduate College Representative:

4/20/12  
Date:

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

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

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

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

## APPENDIX I

### STATEMENT FOR PROGRAMS OF STUDY CATALOG

*Changes to result from the proposed program revision are shown as Track Changes edits applied to the current 2009-10 version of the MatSE Graduate Programs of Study entry.*

## Materials Science and Engineering

[matse.illinois.edu](http://matse.illinois.edu)

Head of the Department: David G. Cahill

Director of Graduate Studies: Moonsub Shim

201 Materials Science and Engineering Building

1304 West Green Street

Urbana, Illinois 61801

(217) 333-1441

Fax: (217) 333-2736

E-mail: [matse@illinois.edu](mailto:matse@illinois.edu)

**Major:** Materials Science and Engineering

**Degrees Offered:** M.S., Ph.D.

**Major:** Materials Engineering

**Degrees Offered:** M.Eng.

**Joint Degree Program:** Master of Science or Doctor of Philosophy in Materials Science and Engineering and the [Master of Business Administration](#)

**Degrees Offered:** M.S. and M.B.A. or Ph.D. and M.B.A.

**Medical Scholars Program:** Doctor of Philosophy (Ph.D.) in Materials Science and Engineering and Doctor of Medicine (M.D.) through the [Medical Scholars Program](#)

### Graduate Degree Programs

The Department of Materials Science and Engineering (MatSE) offers graduate study leading to master's and doctoral degrees. The department is consistently ranked in the top three programs in the nation (undergraduate and graduate) by *U.S. News and World Report*. It offers opportunities to specialize in ceramics, electronic materials, metals, polymers, biomaterials, and/or computational materials science, with strong [research](#) programs in all of the areas. The M.Eng. degree in Materials Engineering is designed for students having obtained a B.S. degree in MatSE or a related field to enhance their experience in the engineering aspects of materials and broaden their knowledge of various types of materials beyond that possible in the standard four year curriculum. The department offers two combined degree programs, a B.S./M.S. and a B.S./M.Eng that permits current undergraduate students to broaden their materials knowledge base. The B.S./M.Eng., in addition, gives the students the opportunity to improve their communication skills, obtain a foundation in business, technology management, and/or entrepreneurship, and gain practical engineering experience.

Opportunity also exists for specializing in computational science and engineering within the department's graduate program via the [Computational Science and Engineering \(CSE\) Option](#). The [Medical Scholars Program](#) permits highly qualified students to integrate the study of

medicine with study for a graduate degree in a second discipline, including Materials Science and Engineering.

## Admission

Students with bachelor's or master's degrees in the natural sciences or engineering will be considered for admission if they have a grade point average of at least 3.00 (A = 4.00) for the last two years of undergraduate study. The general test of the [Graduate Record Examination \(GRE\)](#) is required except for the M. Eng. Applicants for the M.Eng degree are expected to have had an internship prior to enrollment. Admission is possible for the spring semester, but most admissions are for the fall semester. Full details of admission requirements are on the department's [graduate admissions Web site](#).

All applicants whose native language is not English must submit a minimum [TOEFL](#) score of 103 (iBT), 257 (CBT), or 613 (PBT); or minimum [International English Language Testing System \(IELTS\)](#) academic exam scores of 7.0 overall and 6.0 in all subsections. Applicants may be exempt from the TOEFL if [certain criteria](#) are met. [Full admission status](#) is granted for those taking the TOEFL or IELTS since the scores required for admission to MatSE are above the minimum scores demonstrating an acceptable level of English language proficiency.

For the M.Eng. degree program students must have had a B.S. degree in MatSE or a related field (e.g., B.S. degrees in Metallurgy, Polymers or Ceramics, or with concentrations in Materials Chemistry, Condensed Matter Physics, etc.). Students in the program are not expected to continue in and do not have automatic admission to the Ph.D. program in MatSE. The M.Eng. degree is a professional degree.

Applicants to the joint M.B.A. degree program must meet the admissions standards for both programs and be accepted by both programs.

Students may apply to the Medical Scholars Program prior to beginning graduate school or while in the graduate program. Applicants to the Medical Scholars Program must meet the admissions standards for and be accepted into both MatSE and the College of Medicine. An application to the Medical Scholars Program will also serve as the application to the MatSE graduate program. Further information on this program is available by contacting the Medical Scholars Program (125 Medical Sciences Building, 217-333-8146, [mspo@illinois.edu](mailto:mspo@illinois.edu)).

## Degree Requirements

\*For additional details and requirements, please refer to the department's [Graduate Degree Requirements Handbook](#) and the [Graduate College Handbook](#).

### Master of Science

Requirements	Thesis Option	Non-thesis Option
<b>Credit Hours</b>	<b>Hours</b>	<b>Hours</b>
<i>Total Credit for the Degree</i>	<b>32</b>	<b>36</b>

Thesis Research (min-max applied toward the degree)	8	n/a
Course Work	24	36
MSE 492 (credit does not apply toward the degree)	0	0
MSE 595	0-2	0-2
Advisor group meetings (MSE 590) and area seminars (MSE 529, MSE 559) (subject to Other Requirements and Conditions below)	0-4	0-4
Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)	18-24	30-36
<b>Other Requirements and Conditions (may overlap):*</b>		
A minimum of 10 hours of MSE course work.		
A minimum of 12 500-level credit hours applied toward the degree.		
MSE 595 (0 or 1 hour) must be taken every semester in the first two years of residence. A maximum of 2 hours may be applied toward the degree.		
MSE 529 or MSE 559 (0 or 1 hour) must be taken every semester. A maximum of 4 hours may be applied toward the degree.		
The minimum program GPA is 3.0.		
The completed masters thesis must be approved by the advisor and the department head.		
Generally, students on an RA will not be allowed in the non-thesis option.		

## Master of Engineering, Materials Engineering

<b>Requirements</b>	
<b>Credit Hours</b>	<b>Hours</b>
<b><i>Total Credit for the Degree</i></b>	<b>36</b>
Thesis Research (min-max applied toward the degree)	n/a
Course Work	36
MSE 492 (credit does not apply toward the degree)	0

MSE 595	2
Area seminars (MSE 529, MSE 559) (subject to Other Requirements and Conditions below)	0-2
MSE 585 – The equivalent of two semesters of industrial internships or co-ops (30 weeks total; one of the semesters can be during the B.S. program or prior to enrollment). <sup>1</sup>	2-4
Two MSE area specialty courses in the student's chosen area of specialization.	6
MSE area specialty courses in one area outside the student's chosen area of specialization (subject to Other Requirements and Conditions below)	3-6
Technical elective course – Chosen from list appropriate for the student's area of specialization	3
Elective courses – At least 10 hours of these elective courses shall be College of Engineering courses in one or more of the areas of business, technology management, and entrepreneurship as listed on an approved list available from the department. There is the possibility of obtaining one of the Technology Entrepreneur Center Certificates.	13-20
<b>Other Requirements and Conditions (may overlap):*</b>	
A minimum of 11 hours of MSE course work.	
A minimum of 12 500-level credit hours applied toward the degree.	
MSE 595 (0 or 1 hour) must be taken every semester in the first two years of residence. A maximum of 2 hours may be applied toward the degree.	
A maximum of 2 hours of MSE 529 or MSE 559 in combination may be applied toward the degree: Ceramics, Electronic Materials, and Metallurgy area majors take MSE 529 every semester in residence <sup>2</sup> Polymer and Biomaterials area majors take MSE 559 every semester in residence <sup>2</sup>	
The minimum program GPA is 3.0.	
One or two MSE area specialty courses in one area outside the student's chosen area of specialization are required (two if one was not taken as part of the B.S. program)	

1. Students find internship companies and positions with the help of the departmental and College Placement offices. The MSE 585 internship requires approval by the departmental Director of Graduate Studies to insure that it matches the student's individual career objectives and meets the learning goals of the program. Students taking an internship as part of their undergraduate B.S program should also check with the Director of Graduate Studies; his/her approval is required if the student is already accepted in the combined B.S./M.Eng. Program. Students returning to the university after having had materials

engineering employment experience, if it is deemed appropriate, may use that as their internship and base their report on that experience

2. Students will be expected to present an oral report on their internship in either MSE 529 or 559, as appropriate, the semester following completion of the internship.

## Doctor of Philosophy

Requirements	Entering with approved M.S. degree	Entering with approved B.S. degree <sup>3</sup>
<b>Credit Hours:</b>	<b>Hours</b>	<b>Hours</b>
<b><i>Total Credit for the Degree</i></b>	<b>64</b>	<b>96</b>
Thesis Research (min-max applied toward the degree)	44	52
Course Work	20	44
One of CHEM 544, MSE 500, PHYS 504 with a grade of B or higher	4	4
MSE 492 (credit does not apply toward the degree)	0	0
MSE 595	0-2	0-4
Advisor group meetings (MSE 590) and area seminars (MSE 529, MSE 559) (subject to Other Requirements and Conditions below)	0-4	0-8
Elective courses (subject to Other Requirements and Conditions below)	10-16	28-40
<b>Other Requirements and Conditions (may overlap):*</b>		
MSE course work hours	10	20
500-level credit hours applied toward the degree	8	20
MSE 595 (0 or 1 hour) must be taken every semester in the first two years of residence. A maximum of 2 hours (if entering with an M. S. degree) or 4 hours (if entering with a B. S. degree) may be applied toward the degree.		
MSE 529 or MSE 559 (0 or 1 hours) must be taken every semester. A maximum of 4 hours (if entering with an M. S. degree) or 8 hours (if entering with a B. S. degree) may be applied toward the degree.		
The minimum program GPA is 3.0.		



Ph.D. exam and dissertation requirements:

- Qualifying exam
- Preliminary exam
- Final exam or dissertation defense
- Dissertation deposit

3. These students may earn a [Master of Science degree](#) during the Ph.D. program.

### **Joint Degree Program**

The joint M.B.A. program requires completion of the M.S. or Ph.D. degree requirements as prescribed above, plus 60 graduate hours for the [M.B.A. degree](#), including 40 hours of M.B.A. core course work; and 20 hours of M.B.A. elective course work to fulfill the requirements of a concentration.

### **Medical Scholars Program**

Students in the Medical Scholars program must meet the specific requirements for both the [medical](#) and graduate degrees. On average, students take eight years to complete both degrees. The first year of the combined program is typically spent meeting requirements of the Materials Science and Engineering graduate degree.

### **Faculty Research Interests**

The backgrounds of faculty members vary widely within the broad areas of ceramics, electronic materials, metals, polymers, biomaterials, and computational materials science. In addition, research collaborations with other faculty outside the department are frequent. For a detailed list of faculty research interests and publications, view the MatSE department's [faculty biographies](#).

### **Facilities and Resources**

The MatSE department has an outstanding array of facilities available for materials research. These facilities, in addition to laboratories in the department's buildings, include, among others, the Materials Research Laboratory, Center for Microanalysis of Materials, Beckman Institute for Advanced Science and Technology, and Micro and Nanotechnology Laboratory. The National Center for Supercomputing Applications and the MRL Center for Computation are readily available. Information about these facilities may be found at the MatSE department's [facilities information Web site](#).

### **Financial Aid**

Financial aid is available in the form of research assistantships, teaching assistantships, and partial fellowships for students in the M.S. and Ph.D. programs. Students in the M.Eng. program are eligible for teaching assistantships, and partial fellowships in MatSE (only). All applicants, regardless of U.S. citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate [spoken English language proficiency](#) by achieving a minimum score of 50 on the [Test of Spoken English \(TSE\)](#), 24 on the speaking subsection of the TOEFL iBT, or 8 on the speaking subsection of the IELTS. For students who are unable to take the TSE, iBT, or IELTS, a minimum score of 4CP is required on the [EPI test](#), offered on campus. All new teaching assistants are required to participate in the [Graduate Academy for College Teaching](#) conducted prior to the start of the semester.

## APPENDIX II

### Summary of Current and Proposed Degree Programs

#### Current M.S. Degree (without thesis) Program (36 hours)

- 36 hours course work, including at least 10 graduate hours of MatSE courses, 12 hours credit in 500 level courses, and up to 4 hours of MSE 529, 559 or 590 and 2 hours of MSE 595.
- MSE 492 (safety course); credit does not count toward degree.

#### Proposed M.Eng. Degree Program (36 hours)

- 36 hours course work, including at least 11 graduate hours of MatSE courses with 12 hours credit overall in 500-level courses. The course work shall include MSE 585 (two semesters or equivalent, 30 weeks total, of industrial internships or co-ops; one of the semesters can be ENG 310 during the B.S. program or prior to enrollment), 6 hours of 400- or 500-level area specialty courses in the student's area, 3-6 hours of 400- or 500-level MSE courses from a different area (6 hours if 3 hours was not taken as part of the B.S. program), 3 hours of a technical elective in the student's area, 2 hours of MSE 595, and up to 2 hours of MSE 529 or 559. Ten hours of courses in one or more of the areas of business, technology management, and entrepreneurship are required. The obtaining of one of the Technology Entrepreneur Center Certificates is recommended.
- MSE 492 (safety course); credit does not count toward degree.

## APPENDIX III

### **Possible courses, certificates and minors for MatSE B.S.-M.Eng students**

#### **ENG 360/TE 360**

##### **Lect in Engrg Entrepreneurship**

Credit: 1 hours.

Fundamental concepts of entrepreneurship and commercialization of new technology in new and existing businesses. Guest speaker topics vary, but typically include: evaluation of technologies and business ideas in genera; commercializing new technologies; financing through private and public sources; legal issues; product development; marketing; international business issues.

#### **GE 400**

##### **Engineering Law**

Credit: 3 hours. **No graduate credit**

Nature and development of the legal system; legal rights and duties important to engineers in their professions; contracts, uniform commercial code and sales of goods, torts, agency, worker's compensation, labor law, property, environmental law, intellectual property..

#### **ENG 461/TE461**

##### **Technology Entrepreneurship**

Credit: 3 hours.

Critical factors affecting technology-based ventures: opportunity assessment; the entrepreneurial process; founders and team building; preparation of a business plan including market research, marketing and sales, finance, and manufacturing considerations.

#### **ENG 465/TE 465**

##### **Business Technical Consulting**

Credit: 4 hours.

Consulting process, problem definition, project management, technology commercialization, interpersonal skills, human resources management leadership, and followership. Consulting teams formed work directly with a real business client for twelve weeks on a project jointly defined by the client and team.

#### **ENG 466/TE 466**

##### **High-Tech Venture Marketing**

Credit: 1 or 2 hours.

Cornerstone marketing concepts for innovators and engineers to enable analysis of products and technologies from a marketing perspective: engineering product development and adoption life cycle; objectives and strategies; marketing management; communication skills; sales process and tactics; special considerations for new high-tech engineering products and innovations..

## **ENG 491: Interdisciplinary Senior Design (1 to 4 hours)**

The TEC has partnered with the Champaign area entrepreneurs to offer engineering seniors a two-course sequence in which students gain design experience as well as a hands-on experience in launching a startup. The overall completion date is at the end of the second (spring) term. Students participate in engineering and venture creation activities with individual as well as team responsibilities. First-term projects will be provided and supervised by Chicagoland Entrepreneurial Center (CEC) member companies, which are often venture-backed and have up to \$10M in annual revenue. The student teams will also have a College of Engineering faculty advisor that will help them navigate the technical landscape of their projects. Kapil Chaudhary, Principal, i2A fund, will provide several guest lectures.

For the second term, student teams will develop their own technology and will launch a venture to develop a prototype (or reach a pre-determined milestone if a prototype is not feasible). Students will present their ventures at an end-of-year venture fair and demonstration day, open to the public and attended by the CEC leadership and member companies.

The TEC is working with departments in the College of Engineering to offer senior design credit, but apart from Electrical and Computer Engineering, senior design credit is not yet guaranteed.

## **IE 430 Economic Found of Quality Syst**

Credit: 3 or 4 hours.

Total quality systems for planning, developing, and manufacturing world-class products. Economic foundations of total quality. Product value, cost, pricing, environmental quality, activity-based costing, design for assembly, organization structure, lead time, innovation, Taguchi methods, simulation-based significance testing, Strategic Quality Deployment, statistical process control, and conjoint analysis.

## **IE 431 Quality Engineering**

Credit: 3 hours.

Quality Engineering principles and the Six Sigma Define-Measure-Analyze-Improve-Control (DMAIC) process. Application of concepts and methods of statistical process control, designed experiments, and measurement systems analysis to cases of quality and productivity improvement; application of the fundamentals of quality engineering and the Six Sigma to areas of produce development, service enterprise, and manufacturing processes.

## **ENG 560/TE560 Managing Advanced Technol I**

Credit: 1 hours.

Business perspective of managing advanced technology in industry: strategic context of advanced technology; analytical financial tools used to estimate its potential value; legal concepts important in its management; interpersonal issues related to leading and advocating on behalf of advanced technology groups.

### **ENG 561/TE 561**

#### **Managing Advanced Technol II**

Credit: 1 hours.

Continuation of [ENG 560](#). Deepening of insights previously gained by the use of case studies.

### **ENG 565/TE 560**

#### **Technol Innovation & Strategy**

Credit: 2 hours.

Concepts and frameworks for analyzing how firms can create, commercialize and capture value from technology-based products and services. Business, commercialization, and management aspects of technology. Emphasis on reasons that existing firms or startups which have successfully commercialized products or services fail to sustain their success as technology changes and evolves.

### **ENG 566/TE 566**

#### **Finance for Engineering Mgmt**

Credit: 2 hours.

Cornerstone financial concepts for engineering management to enable analysis of engineering projects from a financial perspective: income statements; the balance sheet; cash flow statements; corporate organization; the time value of money; net present value; discounted cash flow analysis; portfolio theory.

### **ENG 567/TE 567**

#### **Venture Funded Startups**

Credit: 1 hours.

Concepts, tools, and language used by venture capitalists (VCs). Venture-scale opportunity assessment and articulation; venture capital financing and valuation; deal structure; term sheets; financial plans for startups; customer development and marketing; product iterations; sales execution.

### **Certificates**

#### **Technology Commercialization (TC) (Undergrad)**

The program is composed of one fundamental course and four hours of elective courses. The courses are designed to allow students to gain a general understanding of the technology commercialization landscape, then to apply that knowledge in a practical manner to an innovation.

Students who wish to obtain a certificate in Technology Commercialization must:

- Complete the required course, *Lectures in Engineering Entrepreneurship* (1 hour)
- Complete at least four credit hours of elective courses/activities from the following list:
  - ABE 430: *Project Management* (3 hours)
  - TE 461: *Technology Entrepreneurship* (3 hours)
  - TE 466: *High Tech Venture Marketing* (2 hours)
  - Placement in the semi-finalist teams in the Cozad New Venture Competition (equivalent to 2 hours course credit)
  - Invention to Venture workshop, held annually in the spring (equivalent to 0.5 hours course credit)

In place of any of the above listed electives, students who have previously taken either: *Product Development for Entrepreneurial Ventures* (3 hr), *An Entrepreneurial Approach to Green Engineering* (3 hr) or *Technology Opportunity Assessment* (3 hr) can receive credit for these courses toward the certificate.

### **Strategic Technology Management (STM) (Graduate)**

Individuals who wish to obtain a certificate in Strategic Technology Management must:

- Hold a bachelor's degree
- Complete the following core courses:
  - ENG/TE 460: *Entrepreneurship for Engineers* (1 hour)
  - ENG/TE 461: *Technology Entrepreneurship* (3 hours)
  - ENG/TE 567: *Venture-Funded Startups* (1 hour)
- Complete any combination of the following elective courses for a total of at least two credit hours:
  - ENG/TE 560: *Managing Advanced Technology I* (1 hour)
  - ENG/TE 561: *Managing Advanced Technology II* (1 hour)
  - ENG/TE 565: *Technology Innovation and Strategy* (2 hours)
  - ENG/TE 466: *High Tech Venture Marketing* (2 hours)
  - ENG/TE 566: *Finance for Engineering Management* (2 hours)

### **Business Management for Engineers (BME) (Graduate)**

Individuals who wish to obtain a certificate in Business Management for Engineers must:

- Hold a bachelor's degree
- Complete the following core courses:
  - ENG/TE 560: *Managing Advanced Technology I* (1 hour)
  - ENG/TE 561: *Managing Advanced Technology II* (1 hour)

- ENG/TE 565: *Technology Innovation and Strategy* (2 hours)
- Complete any combination of the following elective courses for a total of at least two credit hours:
  - ENG/TE 466: *High Tech Venture Marketing* (2 hours)
  - ENG/TE 566: *Finance for Engineering Management* (2 hours)

### **Technology and Management Minor (B.S.)**

Students who wish to pursue this minor must apply for admission to The Hoeft Technology & Management Program in the spring semester of their sophomore year. Enrollment in the minor is limited and admission is competitive. Applications are reviewed by the program staff and offers of admission are based on the student's academic record, extracurricular involvement, demonstrated leadership, and career goals.

#### **TMGT 365 (BADM 365): New Product Marketing**

This course exposes engineering students to the discipline of marketing and to business decision making in the unique context of new product marketing decisions. It provides engineering students a disciplined analytical approach to understanding the marketing of new products from concept generation to launch.

#### **FIN 221: Corporate Finance**

This course is an Introduction to corporate financial management. Students learn how the financial manager's choices add value to shareholder wealth through investment financing and operating decisions.

#### **ACCY 200 TM: Fundamentals of Accounting**

Accountancy 200 focuses on financial and managerial accounting systems. Students will gain practical experience with these systems by preparing budgets, performance reports, and financial statements of for-profit business entities. The course will highlight accounting issues faced by some of the largest and fastest-growing technology companies

#### **TMGT 367 (BADM 367): Management of Innovation and Technology**

This course focuses on the strategic management of technology and innovation in organizations. It builds primarily on broad models of technological evolution and organizational change. Students analyze crucial organizational innovation and technology issues (theoretical analysis) and identify concrete managerial actions to address innovation and technology problems and opportunities (managerial action).

#### **TMGT 366 (BADM 366): New Product Development**

This course presents an overview of the product development process from concept generation to design for manufacturing and project management. There is an emphasis on product definition, early concept development, visual reasoning and engineering graphics. Students work in cross-disciplinary teams working through product development projects.

#### **TMGT 460 (BADM 460): Business Process Modeling**

This course is an introduction to the identification and analysis of business processes. Key elements of the course include:

- the definition of business processes

- tools for designing and analyzing processes, including system simulation and queuing theory
- managerial and organizational aspects of business processes
- an in-depth study of several types of important business processes using case analysis.

#### TMGT 461 (BADM 461): Integrated Project

The Integrated Project course is the capstone of the T&M curriculum. It is taken in the spring semester of the T&M student's second year. Projects are provided by corporate sponsors. They deal with real problems of significant issue to the sponsor and typically involve engineering, finance, accounting, and marketing. Interdisciplinary teams of six to eight students are assigned to each project. These teams work with program faculty advisors and representatives of the sponsors to develop detailed, implementable solutions.

#### **Minor in Business for Non-Business Majors (B.S)**

In addition to prerequisite courses our students would normally have, the following courses are required

ACCY 200-Fundamentals of Accounting (Fall of year of acceptance) **Enrollment is restricted to approved minor students.**

BADM 320-Principles of Marketing (Spring)

FIN 221-Corporate Finance Prerequisites: ACCY 200

BADM 310-Management and Organizational Behavior



## **APPENDIX IV**

### **Letters of concurrence**

From: <w-mischo@illinois.edu>  
Subject: Re: Library concurrence letter  
To: "Phillip Geil" <geil@illinois.edu>  
Cc: Bill Mischo <w-mischo@uiuc.edu>  
Date: Tue, 23 Feb 2010 03:07:55 -0600 (CST)

Phil:

These new programs will not require any additional Grainger Library collection and materials commitments. We are already collecting library materials at a research level in Materials Science and Engineering. Thanks for informing us of this new program and asking about library implications.

Bill

---- Original message ----

>Date: Mon, 22 Feb 2010 13:18:30 -0600

>From: Phillip Geil <geil@illinois.edu>

>Subject: Library concurrence letter

>To: w-mischo@illinois.edu

>

>Prof. Mischo:

> MatSE is in the process of submitting proposals for a Master  
>of Engineering and combined B.S.-M.Eng degree. This is to request a  
>letter of concurrence from the Engineering Library that these degrees  
>will not require added library costs; we need such a letter for  
>approval by the Grad College and the Educational Policy Committee of  
>the Senate. The proposals are attached. We expect that primarily it  
>will be the combined degree, for our B.S. students, that will involve  
>the most students, possibly 5-10 per year. I do not believe they  
>would have any additional effect on the library. An e-mail reply  
>would be sufficient.

>Thanks,

>Phil Geil

>--

>Phillip H. Geil; Ph. 217-333-0149 Fax 217-333-2736

>Department of Materials Science and Engineering

>University of Illinois

>1304 W. Green St.

>Urbana, IL 61801

Date: Tue, 16 Feb 2010 12:23:30 -0600  
Subject: Re: Letter of concurrence  
From: Manssour <manssour@illinois.edu>  
To: Phillip Geil <geil@illinois.edu>  
CC: <mhpleck@illinois.edu>, <vcc@illinois.edu>,  
H- Holly "Tipsword, Michelle D" <tippy6@illinois.edu>  
Thread-Topic: Letter of concurrence  
Thread-Index: AcqvNSOqYkmBShsoEd+S4AAfW/SF2A==

Phil --

We will be happy to provide access and accommodate MatSE students in GE/TEC related courses that are currently under our administrative control.

Please note, as Technology Entrepreneur Center is no longer under IESE, we are in the process of transferring the control of remaining GE/TEC related courses (GE 461, GE 560 & GE 561) to the College of Engineering. We expect this process to be completed by the end of semester.

Please let me know if you need any other information.

Regards,  
-Manssour

\*\*\*\*\*

Manssour H. Moeinzadeh

Associate Head  
Dept. of Industrial & Enterprise Systems Engr  
University of Illinois at Urbana-Champaign  
209 Transportation Bldg. MC-238  
104 S. Mathews Ave.  
Urbana, IL 61801  
<<http://www.iese.uiuc.edu/>,><http://www.iese.uiuc.edu/>,

Phone: (217) 333-0068, FAX: (217) 244-5705

\*\*\*\*\*



Name of existing Illinois (UIUC) degree: \_\_\_\_\_

Name of non-Illinois partnering institution: \_\_\_\_\_

Location of non-Illinois partnering institution:

State of Illinois       US State: \_\_\_\_\_       Foreign country: \_\_\_\_\_

- B.  Proposal to create a new academic unit (college, school, department, program or other academic unit):

Name of proposed new unit: \_\_\_\_\_

- C.  Proposal to rename an existing academic unit (college, school, department, or other academic unit):

Current name of unit: \_\_\_\_\_

Proposed new name of unit: \_\_\_\_\_

- D.  Proposal to reorganize existing units (colleges, schools, departments, or program):

1.  Proposal to change the status of an existing and approved unit (e.g. change from a program to department)

Name of current unit including status: \_\_\_\_\_

2.  Proposal to transfer an existing unit:

Current unit's name and home: \_\_\_\_\_

Proposed new home for the unit: \_\_\_\_\_

3.  Proposal to merge two or more existing units (e.g., merge department A with department B):

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

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

Proposed name and college of new (merged) unit: \_\_\_\_\_

4.  Proposal to terminate an existing unit:

Current unit's name and status: \_\_\_\_\_

- E.  **Other educational policy proposals** (e.g., academic calendar, grading policies, etc.)

Nature of the proposal: \_\_\_\_\_

Revised 10/2012

UNIVERSITY OF ILLINOIS  
AT URBANA-CHAMPAIGN

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



January 10, 2012

Andrea Golato  
Associate Dean  
Graduate College  
204 Coble Hall  
MC-322

Via: Ilesanmi Adesida, Engineering College

Dear Dean Golato:

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

**New Program with Revisions:** "Establish a New Combined Bachelor of Science in Materials Science and Engineering-Master of Engineering with a Major in Materials Engineering in the Department of Materials Science and Engineering, College of Engineering"

**New Program with Revisions:** "Establish a New Major in Materials Engineering in the Department of Materials Science and Engineering, College of Engineering for the degree of Master of Engineering"

Attached is a copy of the requests.

Sincerely yours,

Jonathan Freund, Secretary  
Executive Committee

Approval Recommended:

Ilesanmi Adesida, Dean  
College of Engineering

1/9/12  
Date

JBF/jmh  
Enclosure

c: Victoria Coverstone  
Brent Heuser  
Elizabeth Stovall  
Jean Hanks

UNIVERSITY OF ILLINOIS  
AT URBANA-CHAMPAIGN

Technology Entrepreneur Center

College of Engineering  
350 Coordinated Science Lab, MC-227  
1308 West Main Street  
Urbana, IL 61801-2995



Dr. Phillip Geil  
302C Materials Science and Engineering Building  
Department of Materials Science and Engineering  
1304 W. Green St.  
Urbana, IL 61801

RE: Letter of Technology Entrepreneur Center Support for M. Eng Degree

Dear Dr. Geil:

The Technology Entrepreneur Center (TEC) is pleased to offer our support of the Department of Materials Science and Engineering's proposal for a Masters of Engineering degree. As part of such support, the TEC would welcome students in the M. Eng program to apply for one of our two graduate certificates, have the courses count as some of the elective courses for the degree, or take appropriate courses as general electives.

Please let me know if you have any questions.

Sincerely,



Andrew C. Singer  
Director

Office of the Provost and Vice Chancellor  
for Academic Affairs

Swanlund Administration Building  
601 East John Street  
Champaign, IL 61820



July 25, 2012

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

Dear Professor Miller:

Enclosed is a copy of a proposal from the Graduate College and the College of Engineering to establish a Materials Engineering major in the Master of Engineering degree (M. Eng).

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

Sincerely,

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

Kristi A. Kuntz  
Assistant Provost

KAK/njh

Enclosures

c: V. Coverstone  
P. Geil  
A. Golato  
E. Stovall  
C. Tucker