Graduate Council Curriculum Report
The Graduate Council Curriculum Report (GCCR), which includes all graduate program curricular proposals approved through the Graduate Council curricular review process, is published 12 times each calendar year.

Questions/comments regarding the GCCR or its contents may be directed to the Director of Graduate Education Administration.

February 11, 2015

1. **Program Change**: Enterprise Architecture—change in the requirements for the Master of Professional Studies (M.P.S.) degree program (College of Information Sciences and Technology), page 2

2. **Program Change**: Pathobiology—adoption of the dual-title graduate degree program in Clinical and Translational Sciences (CTS) for the Doctor of Philosophy (Ph.D.) degree (College of Agricultural Sciences), page 11

3. **Program Change**: Entomology—change in the requirements for the Doctor of Philosophy (Ph.D.) and Master of Science (M.S.) degrees (College of Agricultural Sciences), page 25

4. **Program Change**: Art Education—adoption of the dual-title graduate degree program in African American and Diaspora Studies for the Doctor of Philosophy (Ph.D.) degree (College of Arts and Architecture), page 33

5. **Program Change**: Public Administration—change in the requirements for the Master of Public Administration (M.P.A.) degree (Penn State Harrisburg), page 58

6. **Program Change**: Industrial Engineering—addition of a non-thesis pathway to the existing Master of Science (M.S.) degree program; drop the existing Master of Engineering (M.Eng.) degree (College of Engineering), page 71

7. **Program Change**: Chemical Engineering—addition of a non-thesis pathway to the existing Master of Science (M.S.) degree program (College of Engineering), page 96

8. **Program Change**: Civil Engineering—change in the requirements for the Master of Engineering (M.Eng.) degree (College of Engineering), page 108

9. **Program Change**: Religious Studies – drop minor in religious studies (College of the Liberal Arts), page 128
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

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College/School: College of Information Sciences and Technology
Department or Instructional Area: 

New Graduate Program, Option, or Minor: □ Add

Designation of new graduate program: 
Classification of Instructional Programs (CIP) Code: 
Designation of new graduate option: 
Designation of new graduate minor: 

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Existing Graduate Program Option, or Minor: □ Change □ Drop

Current designation of graduate program: Master of Professional Studies in Enterprise Architecture
Current designation of graduate option: 
Current designation of graduate minor: 

New designation of existing graduate program (if changing): 
New designation of existing graduate option (if changing): 
New designation of existing graduate minor (if changing): 

Brief description of the change (if not noted above): Replacing an existing elective, IST 402, with IST 423

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Submitted by Graduate Program Head

Carleen Maitland
Printed name
Signature
Date: 10/20/14

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

Date: 10/20/14

Approved by College/School Dean/Chancellor (or Designee):

Date: 10/21/14
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On behalf of C. Andrew Cole  
Printed name: [Signature]  
Date: 1/8/15

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On behalf of Joan Redwing  
Printed name: [Signature]  
Date: 1/8/15

Noted by Dean of the Graduate School:

Regina Vasilatos-Youenker  
Printed name: [Signature]  
Date: 1/12/15
Program Change Proposal

Master of Professional Studies in Enterprise Architecture

Contact: Dr. Peter K. Forster, Associate Dean
Online & Professional Education, College of IST
Pkfl@psu.edu (814) 863-8304
October 21, 2014
# Table of Contents

- Supporting Documentation  pg 3
- Justification  pg 3
- Updated Graduate Bulletin Listing  pg 4
- Evidence of Consultation  pg 7
Supporting Documentation

A. Comparison of current vs. proposed requirements

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
<th>Change</th>
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<tbody>
<tr>
<td>Elective Courses (6 credits)</td>
<td>Elective Courses (6 credits)</td>
<td>Replace IST 402 with IST 423.</td>
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<tr>
<td>Supply Chain – MIS (404), SCM 800, SCM 810, SCM 820</td>
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<td>Security – IN SC 561, IST 454, IST 554</td>
<td>Security – IN SC 561, IST 454, IST 554</td>
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<tr>
<td>Project Management – MANGT 520, MANGT 535</td>
<td>Project Management – MANGT 520, MANGT 535</td>
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<tr>
<td>Independent Studies – IST 596</td>
<td>Independent Studies – IST 596</td>
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B. Justification

IST 402: Emerging Issues and Technologies is a course designed to introduce and provide an overview of emerging issues and leading technologies in the information technology field. IST 402 topics often are assigned a permanent number if the topic is determined to be critical and sustainable for the curriculum.

The IST 402 topic included in the original program proposal was ENTERPRISE INFORMATION MANAGEMENT AND STORAGE ARCHITECTURE. The College curricular committee determined that this course should receive the permanent number, IST 423, replacing the IST 402 in this case. The content of this course has not changed. IST 423 should be continued as an elective course in the MPS in Enterprise Architecture.
Enterprise Architecture (EA)

MARY BETH ROSSON. Interim Dean. College of Information Sciences and Technology
CARLEEN MAITLAND. Interim Associate Dean for Graduate and Undergraduate
Studies

Office of the Dean
College of Information Sciences and Technology
The Pennsylvania State University
332 Information Sciences and Technology Building
University Park, PA 16802-6823
Dean's office: 814-865-3528; Graduate office: 814-865-8711

MICHAEL McNEESE, Associate Dean for Research and Graduate Programs
College of Information Sciences and Technology
The Pennsylvania State University
332G Information Sciences and Technology Building
University Park, PA, 16803
814-863-3450; mmeneese@ist.psu.edu

Degree Conferred:

M.P.S.

The Graduate Faculty

Master of Professional Studies in Enterprise Architecture
Program Description

The Master of Professional Studies Program in Enterprise Architecture (MPS/EA) is a unique program designed for professionals aspiring to advance to roles with enterprise wide scope and authority, such as that embodied by an enterprise architect. The MPS/EA provides a comprehensive educational experience in the principles and practice of Enterprise Architecture
(EA) and integrates both business and enterprise technical knowledge. The program includes courses in project management, enterprise architecture, cost and value management, organizations, business and project strategy, enterprise modeling, the layers of the enterprise information technology architecture, enterprise architecture case studies, scholarship in enterprise architecture, and leadership, governance and change for enterprise architecture.

**Admission Requirements**

Requirements listed here are in addition to general Graduate Council requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.

Applicants must hold either (1) a baccalaureate degree from a regionally accredited U.S. institution or (2) a tertiary (postsecondary) degree that is deemed comparable to a four-year bachelor's degree from a regionally accredited U.S. institution. This degree must be from an officially recognized degree-granting institution in which it operates.

Since the program is multidisciplinary in nature, students from many disciplines may be acceptable for entry into the program. The most qualified applicants will be accepted in the program until all available spaces for new students are filled.

Consideration for admission into the program will be granted to individuals who meet one of the following sets of criteria:

- An approved baccalaureate degree with a minimum grade point average of 2.75 or above, (on a 4.0 scale) a minimum of five years of relevant work experience, three letters of reference, and a one-three page personal statement of relevant experience and goals.
- An approved baccalaureate degree with a minimum of a 3.00 (on a 4.00 scale) grade point average, a minimum of two years of relevant work experience, three letters of reference, and a one-three page personal statement of relevant experience and goals.
- A graduate degree, a minimum of one year of relevant work experience, three letters of reference, and a one-three page personal statement of relevant experience and goals.
- An approved baccalaureate degree, successful completion of three courses in the program with a minimum of a 3.50 (on a 4.00 scale) grade point average as a non-degree graduate student, at least two years of relevant work experience, and a one-three page personal statement of relevant experience and goals.

The language of instruction at Penn State is English. All international applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). The minimum acceptable composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England,
Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

**MPS/EA Degree Requirements**

The Master of Professional Studies in Enterprise Architecture (MPS/EA) program requires a minimum of 36 credits. At least 18 credits must be courses at the 500-level and above (with at least 6 credits of 500-level). A student will take 28 credits of required courses. The remaining 6 course credits of electives are selected from a list of approved courses. The courses will be delivered online through the World Campus.

**Required Courses** (30 credits)


**Elective Courses** (6 credits)

Elective courses are available in

Supply Chain - MIS 404(3), SCM 800(4), SCM 810(4), SCM 820(4)
Enterprise Integration - IST 492423(3), IST 420(3), IST 421(3)
Security - IN SC 561(3), IST 454(3), IST 554(3)
Project Management - MANGT 520(3), MANGT 535(3)
Independent Studies - IST 596(1-3)

*Language and Communication*. All candidates must be competent in the English language and must have demonstrated skills in the communication of ideas both orally and in writing commensurate with the requirement of professional work.

**Pattern of Course Scheduling for MPS/EA program**

The program is highly flexible and is designed to meet the different needs of students and organizations. The courses will be delivered online through the World Campus. With online delivery, the professional master program can easily fit into the work schedule of professionals from around the globe.
Evidence of Consultation

Penn State World Campus

From: DAVID M SYLVIA [mailto:dms39@psu.edu]
Sent: Tuesday, September 30, 2014 2:42 PM
To: Amy Stever
Cc: Sonya Leitzell
Subject: EA Program Change Proposal

Amy,

The World Campus supports inclusion of IST 423 in the course elective list for the MPS in Enterprise Architecture.

Regards,

David

*************************************************************

David M. Sylvia, Professor
Director of Academic Affairs for Graduate Programs
Penn State Online, The World Campus
222G Outreach Building
University Park, PA 16802-7012
Office: 814-863-6726, Fax: 814-863-7042
e-mail: dmsylvia@psu.edu
GRADUATE COUNCIL
PROGRAM, OPTION, OR MINOR PROPOSAL FORM

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<table>
<thead>
<tr>
<th>College/School: Agricultural Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department or Instructional Area: Department of Veterinary &amp; Biomedical Sciences</td>
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NEW GRADUATE PROGRAM, OPTION, OR MINOR: Add ___

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code: __________
Designation of new graduate option: __________
Designation of new graduate minor: __________

Indicate effective semester (cannot be earlier than the first semester following approval): __________

<table>
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<th>EXISTING GRADUATE PROGRAM, OPTION, OR MINOR: Change XX Drop ___</th>
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<tr>
<td>Current designation of graduate program: Pathobiology</td>
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<td>Current designation of graduate option: __________</td>
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<tr>
<td>New designation of existing graduate minor (if changing): __________</td>
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</tbody>
</table>

Indicate effective semester (cannot be earlier than the first semester following approval): First semester following approval

SUBMITTED BY GRADUATE PROGRAM HEAD:

Anthony Schmitt
Printed name
Signature
Date: 9-5-2014

NOTED BY COLLEGE/SCHOOL REPRESENTATIVE TO GRADUATE COUNCIL SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES:

Ramasiwaray Ananthasekararan
Printed name
Signature
Date: 9-12-2014

APPROVED BY COLLEGE/SCHOOL DEAN/CHANCELLOR (OR DESIGNEE):

Gary Thompson
Printed name
Signature
Date: 9-12-2014
RECOMMENDED BY CHAIR, GRADUATE COUNCIL SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES:

On behalf of C. Andrews Cole

Printed name

Signature

Date: 1/22/15

RECOMMENDED BY CHAIR, GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES:

On behalf of Joan Reaming

Printed name

Signature

Date: 1/22/15

NOTED BY DEAN OF THE GRADUATE SCHOOL:

Regina Vasilatos-Younken

Printed name

Signature

Date: 1/23/15
Graduate Program in Pathobiology change proposal

Adoption of the dual-title PhD degree program in Clinical and Translational Sciences

Contacts

Anthony Schmitt
Director, Pathobiology Graduate Program
Associate Professor of Molecular Virology
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Jenny Lotier
Pathobiology Administrative Support Assistant
115 Henning Building
814-863-5786
jrp5220@psu.edu

Contents

1. Objectives of the Program Change .................................................. 2
2. Justification for the Program Change .......................................... 2
3. Implementation of the Program Change ...................................... 3
4. Proposed Bulletin Listing .......................................................... 8
1. Objectives of the Program Change

The objective of this document is to propose the adoption by the graduate program in Pathobiology the dual-title PhD degree in Clinical and Translational Sciences (CTS). A dual-title PhD in Pathobiology and CTS will expand the educational experience of students studying in the interdisciplinary graduate program in Pathobiology to include training, via a unique curriculum and research focus, aimed at preparing students for career paths that involve clinical trials or clinical research programs. The Pathobiology component of the dual-title provides doctoral students curricular training with a unique focus on human health and disease and the opportunity to concentrate in one or more disciplinary approaches including nutritional immunology, reproductive immunology, inflammation, cancer immunology, autoimmune diseases, hypersensitivity, immunotoxicology, toxicology, cancer, immunodeficiency, and infectious disease. The CTS component of the dual-title provides an emphasis on epidemiological, behavioral, outcomes and health services research that transitions scientific findings from the laboratory to the clinical setting to best practices in the community. Pairing of the two training experiences in the Dual-Title PhD in Pathobiology and CTS yields opportunities for interdisciplinary scholarship at the interface of basic science, clinical science, and human health. This new offering does not duplicate other degree programs other IDGPs in the College of Agricultural Sciences or elsewhere at the University.

2. Justification for Program Change

The unifying theme of the Pathobiology graduate program is its research focus on the molecular mechanisms of disease. This includes research on infectious disease, research on immune system-related disorders, and research on toxins and cancer. This focus on disease creates a natural synergy with the CTS program. A dual-title PhD program would allow students to receive outstanding training in the molecular biology and basic scientific principles underlying human disease conditions (Pathobiology) coupled with the opportunity to study the same or related disease conditions from a clinical perspective (CTS). The clinical component of the training will be carried out under the guidance of faculty members selected from CTSI’s Mentoring and Career Advisory and Development Panel (MCDAP) who are experienced in advising students in the clinical and applied sciences. Due to its emphasis on disease mechanisms, the Pathobiology program attracts students who are interested in basic science that has direct clinical relevance. The dual-title degree option will allow these students to go one step further and explore disease conditions not only from a molecular, mechanistic standpoint, but also from a clinical, human health standpoint.

The existing Graduate Certificate Program in Clinical Research offered through the Department of Public Health Sciences at the College of Medicine provides limited exposure to the field of CTS. It is an important adjunct for a limited pool of professionals, most of whom have completed their doctoral program. However, it cannot offer the same integrated training and research experiences offered by a dual-title PhD degree. The Dual-Title PhD in Pathobiology
and CTS is part of a national effort, led by the National Institutes of Health (NIH) Roadmap, to change the culture of health-related research by reducing program compartmentalization and encouraging interdisciplinary team-based science with an emphasis on translation. The end goal is to initiate and sustain strong programs with a bi-translational focus (bench to bed-side and bed-side to bench).

Interdisciplinary training in CTS prepares students for successful careers in industry (ranging from drug design to orthopedic clinical trials) and community and public health, as well as more traditional academic and clinical venues. Of particular interest is the explosive growth of clinical research sponsoring organizations, which now employ more than 66,000 people worldwide and accounted for $20 billion of industry revenue in 2010, or approximately one-third of total pharma and biotech research and development expenditures.¹

The expected benefits of the Dual-Title PhD in Pathobiology and CTS include:

- Value-added training and scholarship for current students
- Addition of novel course work and training not prescribed in an existing (primary) graduate degree program;
- Integration of clinical/translational research training into dissertation work (e.g., Candidacy and Comprehensive Examinations, original research);
- Enhanced methodological/analytical skills and training;
- Expanded employment and career opportunities within the health sciences arena.

3. Implementation of the Program Change

The Dual-Title PhD Degree in Pathobiology and CTS will encourage interdisciplinary scholarly work at the interface between many domains by focusing on human health. Using practicums, course work, and research, the proposed program of study is designed to extend students’ knowledge beyond their primary area of study to foster a greater understanding of and competence in clinical and health-related research. Ultimately, this approach should enable a new breed of scientists capable of targeting their research programs to address the unmet preventative, therapeutic, and diagnostic needs of the future.

The Dual-Title PhD Degree in Pathobiology and CTS curriculum has four general features.

1. Basic and clinical science didactic coursework in each of the following areas:
   - Statistics (3 credits);
   - Epidemiology (3 credits);
   - Bioinformatics (3 credits);
   - Experimental design and interpretation (3 credits);

¹ [http://www.acrohealth.org/fact-sheet.html](http://www.acrohealth.org/fact-sheet.html)
2. Co-mentoring by basic and clinical scientists during students’ dissertation research.
3. Structured experiences in health care and clinical research, including workshops and seminars sponsored by Penn State’s Clinical and Translational Science Institute (CTSI).
4. Exposure to academic, medical, and private sector career opportunities which increasingly value the ability to translate scientific discoveries to clinical settings.

The Ph.D. degree program in Pathobiology requires 21 credits at the 400-level or higher, up to 6 of which could be double-counted toward the requirements of both Pathobiology and CTS. Additional coursework would be reasonably achievable by the end of the third year of graduate studies. Students will select the additional coursework, in consultation with their adviser, from a list of approved courses (see Table); a current list will be maintained by the CTS program office. No new courses in Pathobiology are required to support the Dual-Title PhD Degree in Pathobiology and CTS.

Prospective dual-title students will express an interest in the dual-title graduate degree program early during the recruitment process for Pathobiology. After entering the Pathobiology program in the fall semester, those who are interested in the dual-title program will apply no later than the end of the spring (second) semester of the first year of study in the graduate program, before having taken the candidacy examination. Students interested in the dual-title program will be considered for admission to the CTS Program by a committee consisting of the CTS Program co-directors and faculty affiliated with the Dual-Title PhD Degree in Pathobiology and CTS program. Typically, students in the Pathobiology program complete the Candidacy Examination at the end of the third semester of graduate training, after at least 18 credits have been completed. Graduate students in Pathobiology accepted to the Dual-Title PhD Degree in Pathobiology and CTS will take the Pathobiology Candidacy Examination that will include CTS faculty to allow exposure to the CTS Curriculum and to assure commitment of an appropriate dissertation mentor.

Course requirements for the Dual-Title PhD Degree in Pathobiology and CTS include 18 credits from the following list of approved electives. Students must complete 3 credits of coursework from each of six subject areas, as illustrated in the following Table.

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The 2-credit course BMMB 852 can be used to satisfy the Bioinformatics requirement. In this case, 4 credits must be taken from one of the other subject areas indicated on the Table, so that the total number of credits completed from the Table is 18.
<table>
<thead>
<tr>
<th>Statistics (3 credits)</th>
<th>Epidemiology (3 credits)</th>
<th>Bioinformatics (3 credits)</th>
<th>Experimental design and interpretation (3 credits)</th>
<th>The regulatory environment (3 credits)</th>
<th>Scientific communication (3 credits)</th>
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</thead>
<tbody>
<tr>
<td>HDFS 516 (3) Methods of Research in Human Development</td>
<td>BBH/HPA 440 (3) Principles of epidemiology</td>
<td>BIOS 551 (BMMB 551) (3) Genomics</td>
<td>BB H 502 (PSY 502) (3) Health: biobehavioral perspectives</td>
<td>BBH 551 (3) World Health promotion</td>
<td>BMS 504 (1) Art of scientific communication I</td>
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<td>HDFS 518 (1) Applied Statistics Laboratory</td>
<td>HDFS 527 (3) Social epidemiology</td>
<td>BMMB 852 (2) Applied bioinformatics</td>
<td>BB H 505 (3) Behavioral health research strategies</td>
<td>BIOET 501 (3) Perspectives and methods in bioethics</td>
<td>BMS 505 (1) Art of scientific communication I</td>
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<td>HDFS 519 (3) Methods of Statistical Analysis in Human Development</td>
<td>H PA 528 (3) Health data analysis for research</td>
<td>HDFS 506 (3) Design and evaluation of prevention programs across the lifespan</td>
<td>HDFS 506 (3) Design and evaluation of prevention programs across the lifespan</td>
<td>BIOET 503 (PHIL 573) (3) Ethics and the responsible conduct of biomedical research</td>
<td>HDFS 518 (2) Scientific communication</td>
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<td>H P A 564 (3) Research methods in health services research</td>
<td>PHS 550 (3) Principles of epidemiology</td>
<td>PHS 516 (3) Statistical Genetics</td>
<td>HDFS 508 (1-6) Best practices in preventative interpretation</td>
<td>BIOS 591 (1) Ethics in the life sciences</td>
<td>PSIO 501 (1) Scientific analysis and presentation</td>
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<td>H P A 566 (3) Advanced methods in health services research I</td>
<td>PHS 551 (3) Advanced epidemiological methods</td>
<td>PHS 508 (1-6) Best practices in preventative interpretation</td>
<td>HDFS 508 (1-6) Best practices in preventative interpretation</td>
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<td>PSIO 501 (1) Scientific analysis and presentation</td>
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<td>PHS 520 (3) Principles of biostatistics</td>
<td>PHS 552 (3) Molecular biology of chronic disease</td>
<td>HPA 561 (3) Introduction to research design in health services</td>
<td>PHS 508 (1-6) Best practices in preventative interpretation</td>
<td>HLTHL 961 (3) Bioethics and public health law</td>
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<td>PHS 521 (3) Applied biostatistics</td>
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<td>PHARM 520 (2) Principles of Drug Action</td>
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<td>PHS 522 (3) Multivariate biostatistics</td>
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<td>VBSC 444 (3) Epidemiology of infectious disease</td>
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<td>PHS 524 (3) Longitudinal data analysis</td>
<td>VBSC 445 (3) Molecular epidemiology of infectious disease</td>
<td>PHS 511 (1) Methods used in translational research</td>
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<td>PHS 500 (1) Research ethics for clinical investigators</td>
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<td>PHS 525 (3) Biostatistics for lab scientists</td>
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<td>PHS 580 (3) Clinical trials: design and analysis</td>
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<td>STAT 509 (3) Design and analysis of clinical trials</td>
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<td>STAT 506 (3) Sampling theory and methods</td>
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<td>STAT 525 (3) Survival analysis I</td>
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In addition to mandatory Scholarship and Research Integrity (SARI) and Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC) training (as appropriate), the CTS Colloquium (CTS 590; two semesters), and 6 credits of clinical rotation or practicum approved by the Directors of the CTS Dual-Title Graduate Degree Program (CTS 595 or BMS 571) complete the curriculum.

Graduate students accepted to the Dual-Title PhD Degree in Pathobiology and CTS will be served by the CTS Institute’s (CTSI) Mentoring and Career Advisory and Development Panel (MCDAP). The MCDAP approves the elective courses that a student selects and provides mentoring and guidance beyond that offered by the primary research mentor. MCDAP members are selected by the CTSI Education and Training Co-Directors, due to their experience with mentoring and training junior faculty and graduate students in clinical, behavioral, and applied sciences. High priority for MCDAP membership is given to experience with cross-campus training. As dual-title Pathobiology and CTS Program students are accepted, they will identify a lead mentor from the MCDAP roster. Together, the Pathobiology mentor and the MCDAP mentor will identify a three-person mentoring team that will monitor student progress and identify areas for development that are aligned.
with the core competencies of the Dual-Title PhD Degree in Pathobiology and CTS. Areas for development may include “soft skills” such as leadership, diversity, and teamwork that are expected competencies for successful translational scientists but are not formally evaluated in the Candidacy Examination, Comprehensive Examination, or other required elements of the primary or dual-title degree. It is expected that these skills will be developed and refined both through completion of the coursework and through the laboratory research component of the training, which will focus on collaborative and interdisciplinary approaches to scientific discovery.

Fiscal Resources and Extramural Support. The CTS components of dual-title programs are supported through the Penn State CTSI, sponsored by the University and the NIH. Currently, CTSI support is available for two semesters. Students are brought in through the current Pathobiology program and supported for their first year through the Department of Veterinary and Biomedical Sciences. Ideally the second year of support would be provided through CTSI, and the subsequent years 3-5 of support would come from research funds provided through the primary Pathobiology faculty members’ grants. It is anticipated that a maximum of one or two students in the Pathobiology program will apply to the Dual-Title PhD degree program each year, and there might be some years with no Dual-Title degree students.

The proposed program will minimally impact current course offerings, faculty loads, and faculty advising duties. Students must complete a Final Oral Examination in which the dissertation research is accepted by their mentors and doctoral committee. Thus, a PhD is requested as the degree title for this dual-title program.

There is no accrediting body for the proposed program area. The following is a proposed sequence of study for students seeking the Dual-Title PhD in Pathobiology and CTS.

Year One
- Pathobiology Coursework
- CTS Coursework (statistics and epidemiology; select from list)
- Complete Scholarship and Research Integrity (SARI) Training [1st semester]
- Apply to Dual-Title program
- Establish CTS mentors
- Language Proficiency
- Residency Requirement Fulfilled

Year Two
- Pathobiology Coursework
- CTS Coursework (bioinformatics, experimental design, regulatory environment; select from list)
- CTS 590
- CTS 595
- Complete Candidacy Examination (scheduled by the Pathobiology and CTS program office) [1st semester of Year Two]
Form Doctoral Committee
- Identify Dissertation Topic

Year Three and Beyond
- CTS 590
- CTS coursework (scientific communication; select from list)
- Complete Comprehensive Examination (schedule with Pathobiology and CTS program offices) [no later than 2nd semester of Year Three]
- Schedule Pathobiology 600/601/610/611 credits after completion of the comprehensive exam
- Present Proposal
- Work on Dissertation Topic (e.g., review literature, collect data)
- Write Dissertation
- Defend Dissertation (Final Oral Examination)
4. Proposed Bulletin Listing (revisions marked)

Pathobiology (PATHB)

Program Home Page

Anthony Schmitt, Director, Pathobiology Graduate Program
115 Henning Building
Phone: 814-863-6781
E-mail: aps13@psu.edu

ROBERT PAULSON, Director of the Graduate Program in Pathobiology
104 Henning Building

Degrees Conferred
Ph.D., M.S.
Dual-Title Ph.D. (Pathobiology and Clinical and Translational Sciences)

The Graduate Faculty

The graduate program in Pathobiology is designed to provide flexibility in graduate work while providing opportunities to study immunology, microbiology, nutrition, biochemistry, virology, veterinary pathology, physiology, or toxicology, usually as related to problems seen in domestic animals and human, domestic animal, and wildlife health.

Graduate instruction is directed by graduate faculty members from the Department of Veterinary and Biomedical Sciences and related units including with research interests in dairy and animal science, biochemistry, biology, biophysics, immunology, nutrition, physiology, zoology, and others. The Ph.D. program is designed for completion in three to five academic years. Doctoral candidates usually complete certain required courses and obtain laboratory experience before selecting an area of specialization and completing an original research problem, including the defense of the Ph.D. dissertation.

Facilities for departmental research include laboratories in the Agricultural Sciences and Industries Building, Henning Building, Life Sciences Building, Millennium Sciences Complex, Poultry Disease Laboratory, Animal Diagnostic Laboratory, Centralized Biological Laboratory, and Environmental Resources Research Institute. Opportunities to utilize specialized research equipment exist in other related facilities. The University has an extensive, modern library. A large University computer center and consultation service are available.

Requirements listed here are in addition to general Graduate Council requirements stated in the Academic Information and Procedures and Degree Requirements sections of the Graduate Bulletin.
Admission Requirements

Scores from the Graduate Record Examinations (GRE), or from a comparable substitute examination accepted by a graduate program Pathobiology and authorized by the dean of the Graduate School, are required for admission. At the discretion of the graduate program Pathobiology, a student may be admitted provisionally for graduate study in a program without these scores. Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the .

Applicants with a 3.300 or better grade-point average (on a 4.00 scale) in undergraduate science courses and appropriate course backgrounds will be considered for admission. Applicants should have a baccalaureate degree in a biological science-related field, or a degree as a graduate veterinarian or equivalent. Undergraduate preparation should include biology, chemistry, physics, mathematics through calculus, and preferably biostatistics and biochemistry.

Master’s Degree Requirements

A minimum of 30 graduate credits of coursework at the 400 level or higher is required for the M.S. degree, of which at least 18 credits must be taken in 500- and 600-level courses.

Satisfactory completion of the following courses (grade of C or higher) or their equivalent is required of all M.S. degree candidates:

- Statistics, 3 credits
- Biochemistry or molecular and cell biology, 63 credits (usually chosen from B M B 400, B M B 401, B M B 402, B M B 437, and B M B M M B 5014)
- 6 credits; and
- VS SC 520, Pathobiology (V SC 520), 3 credits.

All graduate Pathobiology students are required to complete one semester of VS SC 590 Colloquium each year as well as 8 elective credits from a list of courses that is maintained by the Pathobiology program office.

Pathobiology requires no program-specific qualifying examinations, and there is no communication/language requirement for the M.S.

A thesis is required of all candidates for the M.S. degree, including 6 credits of VS SC 600.

Doctoral Degree Requirements

The Doctor of Philosophy (Ph.D.) degree places a strong emphasis on research. It is conferred in recognition of the capacity to carry out independent research and the attainment of a high level of
scholarship. General requirements for the Ph.D. specify a minimum period of residence (two semesters, excluding summer sessions, within a 12-month period), the passing of candidacy, comprehensive, and final oral examinations, and the writing of a satisfactory thesis dissertation. The particular combination of courses, seminars, individual study, and research that constitutes an individual student's program is arranged by the doctoral committee and should include the courses that have been designated in the Pathobiology graduate curriculum, [http://vbs.psu.edu/graduateprograms/pathobiology/curriculum](http://vbs.psu.edu/graduateprograms/pathobiology/curriculum), subject to the general policies of the Graduate School Council.

The Graduate School requires no specified number of courses for the attainment of the doctorate. However, all graduate students complete the course requirements outlined. A total of 21 graduate credits of coursework at the 400 level or higher is required for the Ph.D. degree. A minimum grade-point average of 3.00 for work done at the University is required.

There are formal communications requirements for the Ph.D. degree in Pathobiology which are required by the Graduate School Council. The doctoral committee will assess the technical writing and oral communication skills of the candidate and may require that formal course work or other means to improve these skills be undertaken.

The graduate program in Pathobiology requires that each graduate student have 3 credits in statistics. However, Ph.D. candidates in Pathobiology additionally are expected to have statistical skills equivalent to those learned in STAT 501 and STAT 502. In addition, the candidacy examination committee and the doctoral committee will assess the student's competence in statistics and may require that additional course work in statistics be undertaken.

A candidacy examination is given to students entering the Ph.D. program and after they complete at least twelve 18 credits of post-baccalaureate course work.

After being admitted to candidacy, each doctoral candidate is guided by a doctoral committee consisting of four or more members of the graduate faculty as specified by the Graduate School. At least one member, and preferably two, are from other departments. These committees are appointed through the Office of Graduate Student Programs Enrollment Services, upon recommendation of the department head, after the student is admitted to candidacy.

**Clinical and Translational Sciences Dual-Title Degree Program**

Doctoral students with research and educational interests in clinical and translational science may apply for the Dual-Title PhD Degree in Pathobiology and Clinical and Translational Sciences (CTS) following admission to the Graduate School and Pathobiology and prior to taking the candidacy examination in Pathobiology (end of the third semester). An admissions committee comprised of faculty affiliated with the dual-title program will evaluate applicants. Applicants must have a graduate GPA of at least 3.5 in a research area related to CTS and Pathobiology. Prospective dual-title program students must submit a statement of purpose that addresses the ways in which their
research and professional goals will be enhanced by an interdisciplinary course of study in clinical and translational sciences.

This dual-title degree program emphasizes interdisciplinary scholarship at the interface of basic sciences, clinical sciences and human health. Students in the dual-title program are required to have two advisers from separate disciplines: one individual serving as the primary mentor in the Graduate Program in Pathobiology and another individual serving as the secondary mentor in an area covered by the dual-title program who is a member of the CTS faculty. The dual-title PhD degree in Pathobiology and CTS requires the completion of 18 credits of coursework, in addition to the completion of all requirements for the Pathobiology Ph.D. degree program. Coursework from an approved list of courses is required and covers the areas of epidemiology, bioinformatics, experimental design and interpretation, statistics, regulatory environment and scientific communication. A current list of approved coursework will be maintained by the CTS program head and will be available in the CTS program office and/or on the CTS website. Up to 6 credits of coursework may be double-counted as elective courses to meet the requirements for the Ph.D. in Pathobiology. For students in the dual-title program, the candidacy examination will include content from both the Graduate Program in Pathobiology and the CTS programs and will be completed with the other Pathobiology students in the third semester. The student’s doctoral committee will include faculty from Pathobiology and faculty with expertise in clinical and translational science. The fields of Pathobiology and CTS will be integrated in the student’s comprehensive examination. All dual-title students are required to conduct dissertation research that contributes fundamentally to the fields of Pathobiology and CTS.

Other Relevant Information

After a student has been admitted to graduate study in the department, an adviser will be appointed by the program director. This person may be a member of the eventual M.S. committee or someone else assigned the responsibility for directing the student’s scheduling of course work. In the case of a doctoral candidate, the person may be a member of the eventual doctoral committee or someone else designated the responsibility for directing the student’s scheduling of course work. The adviser is also responsible for initiating the scheduling of the candidacy examination.

Student Aid

Graduate assistantships available to students in this program and other forms of student aid are described in the STUDENT AID section of the Graduate Bulletin.

Graduate courses carry numbers from 500 to 6599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

VETERINARY SCIENCE (V SC) course list

VETERINARY AND BIOMEDICAL SCIENCES (VB SC) course list
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Agricultural Sciences
Department or Instructional Area:

New Graduate Program, Option, or Minor: [ ] Add
Designation of new graduate program: ____________________________
Classification of Instructional Programs (CIP) Code: _____________
Designation of new graduate option: ____________________________
Designation of new graduate minor: ____________________________

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Existing Graduate Program Option, or Minor: [x] Change [ ] Drop
Current designation of graduate program: Entomology Ph.D. and M.S.
Current designation of graduate option: ____________________________
Current designation of graduate minor: ____________________________
New designation of existing graduate program (if changing): ____________________________
New designation of existing graduate option (if changing): ____________________________
New designation of existing graduate minor (if changing): ____________________________

Brief description of the change (if not noted above): update of core requirements

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Submitted by Graduate Program Head

[Signature]
Date: 11-11-2014

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

[Signature]
Date: 11-19-14

Approved by College/School Dean/Chancellor (or Designee):

[Signature]
Date: 12-4-14
<table>
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<tr>
<th>Subcommittee on New and Revised Programs and Courses:</th>
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<tr>
<td><strong>On behalf of C. Andrew Cole</strong></td>
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<tr>
<th>Graduate Council Committee on Programs and Courses:</th>
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<tr>
<td><strong>On behalf of Joan Redwing</strong></td>
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<td><strong>Date:</strong></td>
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<th>Dean of the Graduate School:</th>
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<tr>
<td><strong>Regina Vasilatos-Younker</strong></td>
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SUPPORTING DOCUMENTATION REQUIRED FOR PROGRAMS, OPTIONS, OR MINORS (Adds, Changes, or Drops)

All proposals must include a justification statement for action being taken. Submit 1 copy of the proposal form and 2 copies of the supporting documents to the University Curriculum Coordinator at the University Faculty Senate Office. It is important that the proposal include a copy of the program in a format suitable for inclusion in the *Graduate Degree Programs Bulletin*. Prepare documentation in the outline format as shown below. The proposer is reminded that the Subcommittee and Committee reviewing the proposed program may not have knowledge of the field and is encouraged to provide as much documentation as possible for the reviewers. All proposals, whether a new program or a program change, must be consecutively paginated or the proposal will be returned to the proposing unit. In addition, a table of contents needs to be included in the proposal.

NEW PROGRAMS, OPTIONS* AND MINORS**

A. The objectives of the program: an explanation of how the proposal meets the new educational objectives and/or strengthens existing programs of the college(s) and the University; what students may expect to accomplish through the new program; and a statement of how the new offering does not duplicate other degree programs within the department/college/University.

B. A list of new courses to be established as a part of the new offering.

C. A complete program statement. This should be an arrangement of courses in accordance with degree requirements and with identification of the pattern of scheduling. A list of the required courses, typical electives, etc. that will logically be taken by a student enrolling in the new program should be included. Courses that are new courses should be distinguished from existing courses. Any statement must be submitted in a format for bulletin copy with additional material if necessary (provide both a hard copy and on diskette).

D. A statement of admission requirements should be included, i.e., required test scores, minimum junior/senior GPA, as deemed appropriate by the proposer.

E. A justification for the program. The proposal should include a statement regarding the necessity for the program, i.e., why the program should be offered; and information on the ability of the department to offer a quality program. Included in the section should be the projected size of the program and its impact on current course offerings and faculty load as well as additional faculty advising duties.

F. Accreditation: The proposal should include information regarding any accrediting body for the proposed program area, i.e., is there an accrediting body or board (if so, please identify); or, if appropriate to the field, will the program prepare students for licensure in the field? Programs for which accreditation exists must pursue and achieve full accreditation.

G. Include written response from departments affected.

CHANGES IN PROGRAMS, OPTIONS*, AND MINORS** (including program name changes)

A. A revised version of the affected area showing both the old program requirements and the new program requirements (so that the reviewers can determine what specifically is being changed). The proposal should include a side-by-side comparison of entry requirements, number of credits required, specific courses to be taken, etc. A copy of the revision to the *Graduate Bulletin* copy must be included, and the proposer is requested to use underlining, bolding, or italics to indicate changes.
Table of Contents

| Description of Master's Degree and Course Requirements – Old and New | 3 |
| Description of Ph.D. Degree and Course Requirements – Old and New | 4-5 |
| Justification | 5 |
| Response from other programs | 5 |
The Master of Science degree in Entomology is an intermediate degree leading toward the development of special knowledge in entomology. It provides training for prospective doctoral candidates. A minimum of 30 credits (400 and 500 level) are required, with at least 20 credits earned in residence. At least 18 credits in the 500 and 600 series must be included in the program. A minimum of 12 credits in coursework (400 and 500) must be completed in the major program.

The program requires all students to take ENT 518, ENT 520, ENT 522, ENT 530 (2 credits), and 3 credits of 400- or 500-level ENT course, and 3 credits of statistics (i.e., STAT 501, 502, 541, AG 400, or equivalent). An insect collection is required at the end of the first year of courses. Additional courses may be selected by the student in consultation with his/her graduate committee. Each Master's student is expected to serve as a teaching assistant for 3 credits. Each student must present the results of thesis research at a departmental seminar, and the student may register for 1 credit of ENT 590 that semester. A thesis equivalent to 6 credits (ENT 600) is required. A final oral examination covering the general field of entomology, with emphasis in the student's area of specialization, is required by the department. This is to be administered by the student's committee. A favorable vote of a two-thirds majority is necessary for passing.

Committees for master's degree candidates should be formed during the first semester, and are suggested jointly by the student and advisor, with approval by the Department Head. Masters committees have a minimum of three members. One of these should be from another degree program, particularly if the student plans to minor in that area. Adjunct faculty members cannot constitute a majority of the committee. The student and committee shall meet early in the process to plan the student's program and approve a thesis project.

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<td>teaching assistant for 3 credits. Each student must present the results of</td>
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<tr>
<th>Old Course Requirements</th>
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<tr>
<td>ENT 518: Insect Natural History (2 credits)</td>
<td>ENT 432: Insect Biodiversity &amp; Evolution (4 credits)</td>
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<tr>
<td>ENT 520: Frontiers in Insect Science (4 credits)</td>
<td>ENT 518: Insect Natural History (2 credits)</td>
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<td>ENT 522: Critical Thinking and Professional Development (6 credits)</td>
<td>ENT 522: Critical Thinking and Professional Development (6 credits)</td>
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<tr>
<td>ENT 530: Advanced Seminar in Insect Science (1 credit) (Required: 2 credits)</td>
<td>ENT 530: Advanced Seminar in Insect Science (1 credit) (Required: 2 credits)</td>
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<td>3 credits statistics (i.e., STAT 501, 502, 541, AG 400 or equivalent)</td>
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### Ph.D. Degree

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<td>The degree of doctor of philosophy signifies high scholastic achievement and demonstrated capability in independent research. Although there is no formal credit requirement at the Ph.D. level, five academic years of full time graduate work beyond the bachelor's degree are normally required. Some of the work may be completed off campus or on a part-time basis, but between the time of acceptance as a candidate and completing the degree requirements the student must spend two academic sessions in residence within a twelve-month period. The program requires all students to take ENT 518, ENT 520, ENT 522, and ENT 530 (4 credits). An insect collection is required at the end of the first year of courses. Other course requirements are dependent on the student's program of study. Each Ph.D. student is expected to serve as a teaching assistant for 6 credits. The results of the dissertation research must be presented at a departmental seminar. In addition, students must take and pass a comprehensive and final oral examination. Students commencing a doctoral program may have a provisional committee appointed as soon as the advisor is selected. Students are not formally admitted to the doctoral candidacy until they have passed a candidacy examination. A favorable vote by two-thirds of the Candidacy Committee members is necessary for acceptance of a candidate. The official doctoral committee is approved by the Department Head and is appointed by the Graduate Dean through the office of Graduate Enrollment Services after the student has passed the candidacy exam. Doctoral committees for students in the entomology program include at least three members from the department, at least one member from a related field outside Entomology, and a total of no fewer than four members; five members are recommended. Typically, committee members are chosen in consultation with the advisor. If the student has a formal minor, a representative of the minor field must be on the committee. The student and committee should meet early in the degree process to plan the student's Ph.D. program and approve a thesis project. A student may change advisor or committee members without prejudice. The doctoral committee guides and monitors the student’s progress, administers the comprehensive and final oral examinations, and evaluates the dissertation. A candidate for the degree of Doctor of Philosophy is required to demonstrate high-level competence in the use of the English language, including reading, writing, and speaking, as part of the language and communication requirements for the Ph.D. Entomology assesses and works to improve competence of both domestic and international students. Assessments to</td>
<td>The degree of Doctor of Philosophy signifies high scholastic achievement and demonstrated capability to perform independent research. Although there is no formal credit requirement at the Ph.D. level, five academic years of full time graduate work beyond the bachelor’s degree are normally required. Some of this work may be completed off-campus or on a part-time basis. However, between the time of acceptance as a candidate and completing the degree requirements, the student must spend two academic sessions in residence within a twelve-month period. The program requires all students to take ENT 432, ENT 518, ENT 520, ENT 522, and ENT 530 (4 credits) and 3 credits of 400- or 500-level ENT course. An insect collection is required at the end of the first year of courses. Other course requirements are dependent on the student’s program of study. Each Ph.D. student is expected to teach 6 credits. The results of the dissertation research must be presented at a departmental seminar. In addition, students must take and pass a comprehensive and final oral examination. Students commencing a doctoral program may have a small provisional committee appointed as soon as the advisor is selected. Students are not formally admitted to the doctoral candidacy until they have passed a candidacy examination. A favorable vote by two-thirds of the committee members is necessary for acceptance of a candidate. The official doctoral committee is approved by the Department Head and is appointed by the Graduate Dean through the office of Graduate Enrollment Services after the student has passed the candidacy exam. Doctoral committees for students in the entomology program include at least three members from the department, at least one member from a related field outside Entomology, and a total of no fewer than four members; five members are recommended. Typically, committee members are chosen in consultation with the advisor. If the student has a formal minor, a representative of the minor field must be on the committee. The student and committee should meet early in the degree process to plan the student’s Ph.D. program and approve a thesis project. A student may change advisor or committee members without prejudice. The doctoral committee guides and monitors the student’s progress, administers the comprehensive and final oral examinations, and evaluates the dissertation. A candidate for the degree of Doctor of Philosophy is required to demonstrate high-level competence in the use of the English language, including reading, writing, and speaking, as part of the language and communication requirements for the Ph.D. Entomology assesses and works to improve competence of both domestic and international students. Assessments to</td>
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Assessments to evaluate competency prior to the candidacy exam include pieces of original writing required as part of ENT 522 (Professional Development). Oral communication competency is evaluated during the candidacy examination. Students needing assistance are directed to appropriate remedial activities. (International students should note that passage of the minimal TOEFL or IELTS requirement does not demonstrate the level of competence expected of a Ph.D. from Penn State.)

There is no foreign language requirement for the Ph.D. degree. However, depending on the nature of the thesis research and with the advice and consent of the Doctoral Committee, competency in a foreign language may be required as a part of the doctoral studies of certain students.

<table>
<thead>
<tr>
<th>Old Course Requirements</th>
<th>New Course Requirements</th>
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<tr>
<td>ENT 518: Insect Natural History (2 credits)</td>
<td>ENT 432: Insect Biodiversity &amp; Evolution (4 credits)</td>
</tr>
<tr>
<td>ENT 520: Frontiers in Insect Science (4 credits)</td>
<td>ENT 518: Insect Natural History (2 credits)</td>
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<tr>
<td>ENT 522: Critical Thinking and Professional Development (6 credits)</td>
<td>ENT 522: Critical Thinking and Professional Development (6 credits)</td>
</tr>
<tr>
<td>ENT 530: Advanced Seminar in Insect Science (1 credit)</td>
<td>ENT 530: Advanced Seminar in Insect Science (1 credit)</td>
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<tr>
<td>(Required: 4 credits)</td>
<td>(Required: 4 credits)</td>
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<tr>
<td></td>
<td>One 400-or 500-level ENT course (3 credits)</td>
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B. A justification for changes made, such as updating instruction, together with an indication of expected enrollments and any effects on existing programs.

The proposed changes will update our program to reflect current expectations of students, employers and the research community. Students entering the Entomology graduate program come from a variety of scientific fields and background. The new course sequence is designed to cover the breadth (ENT 522 and 3 credits of ENT 400- or 500-level course) and depth (ENT 432, ENT 518 and ENT 530) of material Entomology graduates are expected to have mastered. The ethics component required by the Graduate School has been embedded within ENT 522. The old course sequence did not include biodiversity and evolution, concepts and information critical to the graduate education of entomologists, and the depth of information provided by a 400- or 500-level ENT course. The new course sequence eliminates ENT 520, which provided a broad overview of the entomological field, and instead requires students to select at least one course providing greater depth. Exposure to breadth of entomology is provided by the existing requirement of four 1-credit seminars in entomology (ENT 530). The new course sequence recognizes the need for a common core of information to all entomology graduate students, while acknowledging and facilitating the different goals and expectations of our faculty and students. The new degree requirements allow each student and his/her major advisor and graduate committee to focus on course content that will enhance student success. The required courses emphasize communication (written and oral), ethics, research study design and graduate-level entomological knowledge.

C. Include written response from departments affected by the changes.

No departments other than Entomology will be affected by this change.
DROPPING OF PROGRAMS, OPTIONS* AND MINORS**

A. A justification for the requested drop.
B. Include written response from departments affected by the change.

*An option is "a specialization within a major that involves at least one-third of the course work credits required for the major, but need not be more than 18 credits." All options within a major must have in common at least one-fourth of the required course work credits in the major. A student can only be enrolled in an option within his/her major. All programs are encouraged to use option in lieu of emphasis or track when preparing program changes or proposing new program specializations.

**A minor must be in one of the approved graduate degree programs offered at Penn State or a formal graduate minor program that has been approved by the Graduate Council and should provide valuable intellectual and/or professional breadth and depth to a student’s program. A minor must consist of a minimum of 15 credits for doctoral programs and 6 credits for master’s programs.

Prepared by the Committee on Programs and Courses 1996
Revised by the Committee on Programs and Courses 2003

The program proposal form is available at
The course proposal form is available at
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: Arts and Architecture
Department or Instructional Area: Art Education

New Graduate Program, Option, or Minor: □ Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code:
Designation of new graduate option:
Designation of new graduate minor:

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Existing Graduate Program Option, or Minor: □ Change □ Drop

Current designation of graduate program:
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Adoption of the dual title PhD program in African American Studies

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Submitted by Graduate Program Head
Christina M. Thompson
Printed name: Tina M. Thompson
Signature: Tina M. Thompson
Date: 10-3-14

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
Charles Andrew Cole
Printed name: Charles Andrew Cole
Signature: Charles Andrew Cole
Date: 12/4/14

Approved by College/School Dean/Chancellor (or Designee):
Gary Keeler
Printed name: Gary Keeler
Signature: Gary Keeler
Date: 12/3/2014
<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
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<th>Date</th>
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<tbody>
<tr>
<td>Chair, Graduate Council Subcommittee on New and Revised Programs and Courses</td>
<td>C. Andrew Cole</td>
<td>[Signature]</td>
<td>4/21/15</td>
</tr>
<tr>
<td>Chair, Graduate Council Committee on Programs and Courses</td>
<td>Joan Rea</td>
<td>[Signature]</td>
<td>4/22/15</td>
</tr>
<tr>
<td>Dean of the Graduate School</td>
<td>Regina Vasilaros-Younken</td>
<td>[Signature]</td>
<td>4/23/15</td>
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</tbody>
</table>
22 August 2014

Dear Steve,

On behalf of the Department of African American Studies, I am writing to express our enthusiastic support for your efforts to adopt our dual title PhD program. We look forward to working closely with you and your faculty to increase the capacity and expand the reach of our interdisciplinary graduate program. Please let me know if I can do anything to facilitate the process in your department, or if you need me to make this endorsement manifest in some other way.

Sincerely,

Paul C. Taylor
Associate Professor of Philosophy and African American Studies
Head of African American Studies
October 8, 2014

Professor B Stephen Carpenter II,
30F Borland Building
University Park, PA 16802.

Professor Carpenter,

Congratulations to you and the Art Education faculty for all the work that's been put in to develop the collaboration with the Department of African American Studies in adopting their dual title Ph.D. This program initiative adds a definitive component to our graduate curriculum that will not only serve our art education Ph.D. grads, but MFA students whose work explores interdisciplinary perspectives and a diverse embrace of cultural production. Adding another dual title degree to complement our Masters and Ph.D. in Art Education and Women's Studies represents another step in the process of re-configuring our art education graduate program to meet the changing needs and demographics of the diverse cohorts of new students we are attracting.

I look forward to the opportunity to assist in moving this program proposal forward.

Sincerely,

Graeme Sullivan, Ph.D.
Director, Penn State School of Visual Arts
A proposal to the Graduate Council from the Art Education Program
to Adopt the Dual-Title PhD Degree Program in African American and Diaspora Studies

Submitted by the Art Education Program
B. Stephen Carpenter, II, Professor in Charge, bsc5@psu.edu
Christine Marmé Thompson, Coordinator of Graduate Studies, cmt15@psu.edu

July 2014
A proposal to the Graduate Council from the Art Education Program
to Adopt the Dual-Title PhD Degree Program in African American and Diaspora Studies

Table of Contents

I. Program Justification and Objectives ................................................................. 3
   A. The Art Education Program In Context ............................................................ 3
   B. The Colleges in Context: Liberal Arts and Arts and Architecture ...................... 3
   C. Justification for the Degree Title ................................................................. 5
   D. Program Objectives .................................................................................... 5
   E. Size of Program and Impact on Course Offerings and Faculty Load ............... 6
   F. Student Recruitment, Admission, and Employment Prospects ....................... 6
   G. Costs and Funding .................................................................................... 7
   H. Advising and Program Navigation ............................................................... 8
   I. Consultation .............................................................................................. 8
II. List of New Courses ..................................................................................... 9
III. Complete Program Statement .................................................................. 10
I. Program Justification and Objectives

A. The Art Education Program In Context

The Art Education Program at The Pennsylvania State University offers BS, MS, MPS, and PhD degrees and is dedicated to the creation and application of knowledge across disciplinary and methodological boundaries, and promotes leadership, social justice, global understandings, and innovative professional practice in relation to real-world problems. The Art Education Program focuses on intersections among the study of works of art, visual culture, and educational practice and the evolving disciplines of child and youth culture, digital technologies, feminist and critical pedagogies, critical race theory, histories of art education, curriculum and cultural studies, arts-based research, and practice-led research. There is considerable international development and national debate about the expanding role of artist-researchers as cultural practitioners, and art educators as arts-based researchers. The national and international scope of this conversation is forging alliances across disciplines around common interests.

The Art Education Program at Penn State seeks to establish just such an alliance with African American and Diaspora Studies by adopting the existing dual-title PhD degree program. The School of Visual Arts (SoVA) at Penn State is very well positioned to expand our graduate program options in visual arts and art education to further strengthen our strategic focus and forward-thinking nature. In short, as part of our response to the Core Council Report in 2011, the Art Education Program seeks to establish a stronger strategic focus linked to a call for curriculum and structural change consistent with the mission of the University. In keeping with the underlying values of the University mission, the Art Education Program has adopted a vision that is integrative, distributive, inclusive, collaborative, innovative, and creative. This vision is outlined in our program response to the 2011 Core Council Report (CCR).1 The CCR assessed the Art Education Program, as having, “had an illustrious history at Penn State,” however, was currently “an underperforming program.” Among the CCR recommendations included instructions for the College of Arts and Architecture to “establish stronger strategic focus with better performance indicators,” to “drop some under-enrolled programs or poorly performing programs,” and to “develop new programs in forward-looking areas.” In addition, the CCR required the Art Education Program to produce “a viable plan that strengthens the graduate program by improving: the pool of applicants, the yield on offers, graduation progress/rates, documentable placement of graduates.” In each of our annual reports, our actions since the CCR have addressed or exceeded the points which can be assessed in the past three years: we discontinued the M.Ed. program, strengthened our pool of applicants, increased our yield on offers, and have improved documentation of placement of our graduates. The adoption of the dual degree in African American and Diaspora Studies will further our efforts in these areas in general, and specifically in terms of improving our pool of applicants through the development of this new program as a forward-looking area.

In response to reforming Art Education at Penn State, our faculty has worked over the past three years to revise the program. The program now blends its academic focus with the flexibility of an interdisciplinary perspective. More specifically, we have re-visioned the PhD program as a

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“forward-looking” degree that provides leadership in keeping with the strategic goals of the University and the emerging research initiatives of the College.

The proposed adoption of the PhD degree program in African American and Diaspora Studies by Art Education (AED/AFAM) builds on the success of an existing dual-degree program between Art Education and Women’s Studies (MS and PhD). The AED/AFAM dual-title PhD degree will provide graduate students an interdisciplinary option to examine intersections between content, theories, methodologies, scholarship, and practices in both Art Education and African American and Diaspora Studies.

B. The Colleges in Context: Liberal Arts and Arts and Architecture

The proposed AED/AFAM dual-title PhD degree program will raise the profile and improve the quality of graduate education in the College of Liberal and the Arts College of Arts and Architecture.

The 2008-13 strategic plan for the College of the Liberal Arts announces the aspiration of moving from national prominence to national leadership. It announces further that two key steps to achieving this goal are achieving national leadership in graduate education and recruiting and retaining top faculty, and that multi-disciplinarity is a key value organizing the pursuit of this goal. The proposed AED/AFAM dual-title PhD degree program will be a valuable resource in the pursuit of national leadership.

The 2008-2013 strategic plan for the College of Arts & Architecture offers four goals, three of which are directly connected to the proposed dual title degree. In response to Goal I, the proposed adoption of the dual-title degree will assist the College of Arts & Architecture in strengthening its significance and reputation in the arts by providing the only dual-title PhD degree in Art Education and African American and Diaspora Studies in the country. Similarly, in response to Goal II, this degree will further contribute to a climate that encourages diverse learning perspectives and attract a diverse student population that includes members of historically under-represented groups. In response to Goal III, the proposed degree will enrich the lives of the University and the region by celebrating and disseminating the arts through outreach, art exhibitions and symposia, service learning, and other interdisciplinary and co-sponsored events and programs.

As of Spring 2012, only 11 institutions offer PhD degrees in African American and Diaspora Studies, among which include Harvard, Yale, Berkeley, Northwestern, and Michigan State. Similarly, 11 institutions offer PhD and EdD degrees in Art Education nationally, among which include Ohio State, Arizona State, University of Georgia, University of Arizona, and University of Illinois. As is the case with the current dual degree in Art Education and Women’s Studies, no other institution nationally offers a PhD dual-degree in Art Education and African American and Diaspora Studies. As the only such dual title degree in the country, the proposed AED/AFAM dual-title PhD degree will improve the quality of graduate education by providing

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2 Based on institutions represented by doctoral student presenters at the annual Marilyn Zurmuehlen Working Papers in Art Education Graduate Research session sponsored by the Seminar for Research in Art Education over the past several years.
an intellectual center and institutional home for various approaches to graduate-level study of African American life that has emerged at Penn State over the last several years. The university offers many resources to support this scholarship; however they currently exist in a loose array spread across the institution. The proposed dual-title program has the potential to systematize these resources across the university and organize them into a more closely related network to support interdisciplinary research, instruction, outreach, and programming.

The proposed AED/AFAM dual-title PhD degree program will assist the Art Education Program and the Department of African American and Diaspora Studies to recruit and retain top doctoral students and faculty whose interests intersect pedagogical, theoretical, and historical concerns in areas not limited to African American/Black studies, critical race theory; African American/Black visual culture, African American/Black Black art; African American/Black Black aesthetic/s.

The proposed AED/AFAM dual-title PhD degree program will reflect a commitment to interdisciplinarity and will build a commitment into the structure of both programs. At Penn State, a dual-title PhD program between History and African American and Diaspora Studies has been approved with the goal of enrolling its first students in Fall 2014. As a partnership between the two units, the proposed program will institutionalize a collaboration that echoes current interests within the College of Arts & Architecture and the African American and Diaspora Studies community. Similarly, the proposed AED/AFAM dual-title degree makes evident commitments from scholars and administrators in both areas to pool resources and share opportunities across colleges that will result in exponential benefits for both programs, and their graduate students and faculty.

C. Justification for the Degree Title
Among the primary advantage of adopting the dual-title degree in African American and Diaspora Studies is the inclusion of a shared space for intellectual and academic interdisciplinarity, a space that seeks to strengthen the reputation of individual programs/departments through innovative degree programs, increased recruitment of quality graduate students, and improved placement of doctoral graduates. The proposed AED/AFAM dual-title PhD program aims to prepare Penn State doctoral graduates with a competitive advantage for Art Education and African American and Diaspora Studies-related careers in academia, educational sites, cultural institutions, administration, and elsewhere. Further, this dual-title degree program builds on the existing research agendas, scholarly experiences, and institutional networks of current Art Education and African American and Diaspora Studies graduate faculty as a means to provide scholarship, service, and professional socialization opportunities for Penn State graduate students. Through a shared vision and mission, Art Education and African American and Diaspora Studies can forge new territory within their respective disciplines by expanding the content and focus of each through doctoral research and joint projects concerned with key questions in African American and Diaspora Studies/Black Studies, visual culture, art, aesthetics, and education. Further, with increased national attention on issues of race and student achievement, this interdisciplinary dual-degree will be well positioned as a site in which innovative scholarship can emerge that would be otherwise impossible to construct from separate disciplinary practices and fields of study. This dual title degree may also encourage African American scholars in particular, and scholars of color in
general, to engage in doctoral studies art education, a demographic that is desperately under-represented in the field. No accrediting body exists for this dual-degree.

**D. Program Objectives**
The principal aim of the proposed adoption of the African American and Diaspora Studies dual-title PhD program by Art Education is to provide graduate students in art education with an opportunity to engage in interdisciplinary scholarship of African American identity and history in relationship to visual culture, art, and education within a supportive scholarly territory that allows both disciplines to be explored and expanded. Simply, the dual-degree will enable students to cultivate breadth, depth, and possibilities that result from the critical intersection of Art Education and African American and Diaspora Studies. Prospective and currently enrolled students in both programs share overlapping interests and a dual-title degree would afford a formal mechanism to build on common pursuits and strengthen responses to existing research. In support of these goals, and in addition to the existing objectives of the Art Education doctoral program, students in the proposed dual-title PhD program in Art Education and African American and Diaspora Studies will provide the means for students to:

- enable critical examinations of pedagogical, curricular, and artistic implications of works of art (historical and contemporary), visual culture, exhibitions, and related cultural production and practices of seeing and visualization about and informed by African American identity past and present;
- examine established scholarship about African American identity, history, and politics informed by arts-based modes of meaning making, curriculum, theory, research, and pedagogy;
- enact theoretical, philosophical, empirical, arts-based, ethnographic research that troubles, expands, and redefines the discourses that inform and are informed by African American and Diaspora Studies within the context of art, visual culture, and education.
- complete the dual-title degree in a timely manner with the mutual and collaborative support of graduate faculty and administrators from both programs who provide a vibrant, critical, and scholarly environment for success.

Guided by these objectives, this proposed program does not duplicate any other program of graduate study at this institution. Additionally, with these learning objectives at its core, the dual-title PhD program in Art Education and African American and Diaspora Studies will satisfy several broader aims. This dual-title degree adoption will foster scholarly work between the two disciplines which will result in opportunities for community-based programming in schools and cultural institutions, guest scholars, visiting artists, the possibility for new courses—special topics and permanent—, and co-instructional opportunities that will appeal to students in this program and elsewhere in the university. Further, internal and external funding opportunities open up for proposals authored jointly between Art Education and African American and Diaspora Studies faculty to support graduate research assistantships.

**E. Size of Program and Impact on Course Offerings and Faculty Load**
The proposed dual-title PhD program in Art Education and African American and Diaspora Studies seeks to enroll new students each year, drawn from the ranks of current and newly admitted graduate students in Art Education. The three required graduate courses for the proposed dual-title program will be taught by graduate faculty in African American and Diaspora Studies, and will make no additional demands on departmental teaching resources. Similarly, Art Education graduate faculty will already teach the four required graduate courses in Art Education, and therefore this curriculum structure will impose no additional demands on their teaching load because these courses are currently part of our collective teaching load. In fact, the adoption of this dual-title program has the potential to increase the enrollments of all seven required graduate courses between the two existing programs. Discussion of the possibility of designating faculty from Art Education and African American and Diaspora Studies as affiliate faculty is ongoing.

F. Student Recruitment, Admission, and Employment Prospects
The dual-title program will be advertised on the Art Education and African American and Diaspora Studies websites, as well as Graduate Degree Programs Bulletin. Information about the dual-title degree will appear on promotional flyers and posters and will be distributed at professional meetings and conferences, and will be sent to graduate departments and programs in Visual Art, Art History, Art Education, and African American and Diaspora Studies. The Art Education program secured a grant from Equal Opportunity Planning Committee (EOPC) for implementation of a program in Fall 2013 to recruit potential graduate students from under-represented populations, among which include African American students. This EOPC supported program is intended to be an annual event and will enable potential students to visit campus, meet with Art Education faculty, discuss expectations and possibilities for graduate study in Art Education at Penn State, and attend the annual Graduate Research in Art Education Conference when it is hosted by Penn State. African American students are under-represented in Art Education and may be most receptive to this dual-title degree option. Potential students for the dual-title degree may find of interest the visual culture and other resources in the Africana Research Center, the Richards Civil War Era Center, Paul Robeson Cultural Center, and the international archives of art education materials housed in the Special Collections Library on campus of interest. The annual Graduate Research in Art Education conference will help to establish a network for the dual-title PhD program, both in terms of new student recruitment from other participating institutions. Additionally, this dual-title degree program may be of interest to students in the McNair Scholarship program who seek innovative interdisciplinary programs for their graduate study.

Students may enter the proposed program from the ranks of existing graduate students in Art Education and from students newly admitted to the program. Either way, students must declare their intention and secure permission to complete the dual-title program. Students must be admitted into the Art Education program before they can apply to the dual-title program and be considered for admission. Once an application has been reviewed and accepted by the graduate committee in Art Education it will be forwarded to the African American and Diaspora Studies graduate committee for review. The African American and Diaspora Studies graduate committee must approve a student for admission into the dual-title program.
Dual-title degree doctoral students will complete a candidacy examination administered by the Art Education program. The examination must include consideration of the student’s suitability for doctoral research in African American and Diaspora Studies. Students in this dual-title program may need at least one additional semester beyond what is normal to prepare for the requirements for candidacy in both areas.

This dual-title program is designed to prepare graduates to qualify for a wider selection of positions across academic disciplinary and interdisciplinary units in academia, cultural institutions, and elsewhere. Successful graduate placement in academia, cultural institutions, and educational sites will make the program more attractive in terms of recruiting top students and scholars to the program. In turn, the dual-title degree will raise the prestige of both programs and render each more likely to attract a more diverse array of qualified students in the future. The pending retirement of the first generation of African American, Africana Studies, and Diaspora Studies faculty across the United States would place our dual-title graduate program in a strategic position to contribute to the development and production of the next generation of scholars for these academic units. In addition, with increased attention to issues of visual culture, post-colonialism, and racial/identity politics within Art Education, and the pending retirement of many Art Education faculty in the United States and Canada over the next 10 years, this dual-degree program will provide additional opportunities for our graduates to contribute to the scholarly, disciplinary, and interdisciplinary future of art education.

G. Costs and Funding
The Art Education Program seeks to support all admitted graduate students for three years of graduate study, however not all students receive funding upon acceptance into the program. Students supported by funds from the Art Education Program are assigned teaching and other academic duties determined by the Graduate Program Officer and the Director of the School of Visual Arts. Annually, the Art Education Program competes with other units within the College of Arts & Architecture to secure funding for qualified students eligible for support from Bunton-Waller, University Graduate Fellowship, and Graham Awards. In addition, the Art Education Program has access to a limited number of graduate assistantships. While limited, the Art Education Program—through the School of Visual Arts and the College of Arts and Architecture—will seek to distribute tuition and assistantship support to graduate students admitted into the dual-title degree in keeping with standing practices. We envision the Department of African American and Diaspora Studies will supplement this funding from its own awards to support students as possible or share funding responsibility for students in the dual-title degree as available. For example, the Department of African American and Diaspora Studies might provide Grant in Aid support matched by an assistantship stipend from Art Education. Another goal would be for African American and Diaspora Studies to make available support for dual-title students in their fourth year of study—during which time they are typically writing their dissertation—to teach undergraduate courses as determined by the Head of African American and Diaspora Studies. Internal and external funding secured by Art Education and African American and Diaspora Studies graduate faculty will also serve as sources for graduate student support. If approved for adoption, the units will work closely to seek support for all students admitted into the dual-title degree program. Graduate faculty in Art Education and African American and Diaspora Studies will mentor graduate students to write proposals for
funding to support their research and artistic projects. College and university graduate assistantships available to students in this program and other forms of student aid are described in the Student Aid section of the Graduate Bulletin.

H. Advising and Program Navigation
As is the current practice, faculty advisers and Graduate Coordinators in both units will assist students as they enter the program, orient themselves to academic expectations, and in the selection of their courses to ensure that all degree requirements are satisfied in a timely manner. Information about navigating the degree requirements for Art Education can be found on the PhD in Art Education degree section of the School of Visual Arts website: https://sova.psu.edu/degree/doctor-philosophy-art-education. Current PhD admissions requirements and degree requirements are available on the Graduate School Bulletin: http://bulletins.psu.edu/graduate/programs/A/GRAD%20A%20ED.

Students will be encouraged to submit manuscripts for publication in peer reviewed journals and proposals for presentation at research conferences. In addition, graduate students will have opportunities to participate with faculty on research projects, publications, and conference presentations.

I. Consultation
Paul Taylor, Department Head of African American Studies, and Graeme Sullivan, Director of the School of Visual Arts, have each supplied a letter of endorsement for this dual-title degree adoption.

II. List of New Courses
No new course proposals are needed because all required courses in Art Education and African American and Diaspora Studies currently exist.

A ED 502: Research in Art Education (3); AED 505: Foundations in Art Education (3); AED 536: Curriculum Development in Art Education (3); AED 588: History of Art Education (3); AED 590: Colloquium (1);

AFAM 501: Seminar in African American and Diaspora Studies (3); AFAM 502: Blacks in the African Diaspora (3); AFAM 503: Sexual and Gender Politics (3).

That said, students in this dual-degree may also complete three additional Art Education courses as electives but not required. The first two courses are being proposed as permanent courses. The third course exists currently as part of the online MPS graduate degree in Art Education. To varying degrees, each of these three courses includes content that addresses racial and ethnic populations in society, schools, and educational institutions; African American and Hispanic arts and culture; and critical race theory.
AED 522: Participatory Inquiry in the Public Sphere. Proposed Catalog Description: Analysis of contemporary practices of participatory inquiry in the public sphere. Focus on the exploration of theory and practice of collaborative investigations in public sites with emphasis on visual methodologies. A component of the course will examine ways in which racial identity is constructed, perpetuated, and learned through collaborative means within the public sphere. This course will be offered for the first time in Spring 2014 as a Special Topics course. A formal course proposal has been submitted. [Formal course proposal currently in CSCS review: Level 92]

AED 545: Visual Culture: Race, Class, and Gender. Proposed Catalog Description: This graduate-level course is an in-depth examination of how visual culture represents, constructs and influences race, social class and gender identity. This course will be offered for the first time in Spring 2016. A formal course proposal is in development. [Formal course proposal to be submitted Fall 2014]

AED 812: Diversity, Visual Culture, and Pedagogy. Diversity issues in museum and K-12 art education contexts. This is an online course and is required for the MPS degree offered through Penn State World Campus.
III. Complete program statement

Art Education (A ED)
http://bulletins.psu.edu/graduate/programs/A/GRAD%20A%20ED

CHRISTINE M. THOMPSON, Art Education Graduate Coordinator
30E Borland Building
814-865-6570
cmt15@psu.edu

Degrees Conferred:
PhD, MS, MPS, PhD and MS Dual Degrees in Art Education and Women's Studies

The Graduate Faculty

- **Dana Carlisle Kletchka**, Ph.D. (PENNSYLVANIA STATE UNIVERSITY), Curator of Education
- **Booker Stephen Carpenter II**, Ph.D. (PENNSYLVANIA STATE UNIVERSITY), Professor of Art Education and Postbaccalaureate Certification Officer in Art Education
- **Charles R. Garoian**, Ph.D. (STANFORD UNIVERSITY), Professor of Art Education; Director, School of Visual Arts
- **Yvonne M. Gaudelius**, Ph.D. (PENNSYLVANIA STATE UNIVERSITY), Professor of Art Education and Women's Studies
- **Grace Hampton**, Ph.D. (ARIZONA STATE UNIVERSITY), Professor of Art and Art Education
- **Karen Keifer-Boyd**, Ph.D. (UNIVERSITY OF OREGON), Professor of Art Education and Women's Studies
- **Wanda B. Knight**, Ph.D. (OHIO STATE UNIVERSITY), Assistant Professor of Art Education
- **Marissa McClure**, Ph.D. (PENNSYLVANIA STATE UNIVERSITY), Visiting Assistant Professor of Art Education
- **Kimberly Powell**, Ph.D. (STANFORD UNIVERSITY), Associate Professor of Education
- **Mary Ann Stankiewicz**, Ph.D. (OHIO STATE UNIVERSITY), Professor of Art Education
- **Graeme L. Sullivan**, Ph.D. (OHIO STATE UNIVERSITY), Professor of Art Education; Director, School of Visual Arts
- **Christine Marmé Thompson**, Ph.D. (UNIVERSITY OF IOWA), Professor of Art Education

This program helps students prepare for careers in college teaching, administration, research, public school art teaching, and art supervision.

**Admission Requirements**

For admission to the Graduate School, an applicant must hold either (1) a bachelor's degree from a U.S. regionally accredited institution or (2) a postsecondary degree that is equivalent to a U.S. baccalaureate degree earned from an officially recognized degree-granting international institution.
The language of instruction at Penn State is English. International applicants must take and submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). Applicants with iBT speaking scores between 15 and 18 may be considered for provisional admission, enrollment, and, if necessary, remedial course work. The minimum composite score for the IELTS is 6.5.

International applicants are exempt from the TOEFL/IELTS requirement who have received a baccalaureate or a graduate degree from a college/university/institution in any of the following: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, and Wales.

Students who seek admission to the graduate program must make formal application to The Graduate School and admissions committee of the Art Education program. To be admitted without deficiencies, the student is expected to have completed either a baccalaureate degree in art education or a program considered by the admissions committee to provide an appropriate background for the application's degree objectives. Related programs include work in studio art, art history, art education, education, museum education, etc. Deficiencies may be made up by course work that is not counted as credit toward an advanced degree. Students pursuing graduate degrees may simultaneously take course work leading to teaching certification and art supervisory certification. The students who plan to teach art education at the college level should note that some institutions require professors to hold a public school art teaching certificate and to have had public school teaching experience.

Students with a minimum 3.00 junior/senior grade-point average (on a 4.00 scale) and with appropriate course backgrounds will be considered for admission. The most qualified applicants will be accepted up to the number of spaces that are available for new students. Exceptions to the minimum 3.00 average may be made for students with special backgrounds, abilities, and interests. Transcripts should indicate high attainment in appropriate academic and creative work. Letters of recommendation should attest to scholarship and ability to work independently. In addition to the above requirements, there are specific requirements for degree programs:

Ph.D. & M.S. Application Materials:

1. Completed official Penn State Graduate School Application for Admission.
2. Scores from the Graduate Record Examinations (GRE) or from the Miller Analogies Test (MAT) are required for admission. Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.
3. Submit a one- to two-page Statement of Professional Intent which includes: (a) professional objectives, (b) how these objectives would be furthered by graduate study, (c) the areas in which research and creative work are planned, (d) what the applicant hopes to do with the graduate degree he or she is seeking to attain, and (e) evidence that the applicant is prepared to undertake graduate level work.
4. Submit an example of scholarly writing.
5. Submit three (3) letters of recommendation. Letters of recommendation should attest to the applicant’s scholarship and ability to work independently.
6. Submit two (2) official transcripts from all institutions of higher education attended.
7. Submit a Portfolio (optional). Applicants may submit images of their creative works that represent arts-based research or images that illustrate their conception of art.
8. Indicate in your Statement of Professional Intent if you would like to be considered for an Assistantship/Fellowship.

M.P.S. Application Materials:

1. Completed official Penn State Graduate School Application for Admission.
2. Statement of purpose in pursuing the M.P.S. in Art Education.
3. Three letters of recommendation.
4. Teaching portfolio to include teaching philosophy and a sample of curricular materials developed by the applicant.
5. A critical reflective written response to an article provided in the GRADS application site. The response should outline the key arguments made by the author(s), a critical evaluation of the logic and assumptions in the article, and a connection to the applicant's own instructional or professional experience.
6. Curriculum vitae with evidence of professional leadership and service.
7. Two official transcripts from all institutions attended, including official military transcripts (if applicable). (All college or university transcripts are required regardless of the length of time that has passed, the grades earned, or the accreditation of the institutions attended.)
8. International applicants whose first language is not English or who have received a baccalaureate or master's degree from an institution in which the language of instruction is not English, please refer to the international students page for more information about language proficiency.

Master's Degree Requirements

A minimum of 30 graduate credits is required for the M.S. and M.P.S. degrees. Students must take a minimum of 15 credits in art education. Of those, M.S. candidates are expected to complete the following 3-credit core: A ED 502, 505; 536 or 588; and A ED 590 (1 credit for each two semesters enrolled in course work). Students must take additional credits to total a minimum of 15 credits. All master's degree candidates must also complete 6 credits of foundational studies at the 400 level or above in areas such as art history, studio, philosophy, educational theory and policy, educational psychology, psychology, and anthropology. The remaining 9 credits are made up of elective studies.

Additional M.S. requirements. For M.S. candidates, 18 credits of course work must be at the 500 level or above. M.S. candidates must prepare and orally defend a thesis. Requirements include 6 credits of thesis research within the 30 credits.

Additional M.P.S. requirements. Students who seek admission to the M.P.S. in Art Education program should have current or recent teaching positions in a school, museum, cultural
institution, or other community site at the time of application, with the expectation that the student continue to teach art in schools, museum, or other sites throughout the M.P.S. program. Applicants admitted to the degree program who have accumulated credits as non-degree graduate students may have up to 15 credits of coursework accumulated in non-degree status applied to their degree, with approval of the program.

For the M.P.S. in Art Education program, a minimum of 30 graduate credits is required. Students must complete 18 credits in 500-level courses and above, with a minimum of 6 credits at the 500-level. A minimum of 18 credits in art education includes the following Internet-based 3-credit courses: A ED 811, 812, 813, 814, 815, and A ED 594. Selecting from World Campus offering in other programs, students must take an additional 6 credits of Foundational courses at the 400 level or above in art history, studio, philosophy, educational theory and policy, educational psychology, psychology, and/or anthropology, and 6 credits of Elective courses.

M.P.S. in Art Education program participants can start in any semester, taking one online art education course and one or more foundation or elective courses in other programs per semester. A ED 594 is the culminating experience for the program with an action research project in one's teaching context.

**Doctoral Degree Requirements**

*Admission to Candidacy.* Once admitted to the doctoral program, all students must take a candidacy examination, which is given during the first year that the student is in residence. During the candidacy examination there is a review of (1) the student's professional resume; (2) a statement regarding the general direction of the student's research interests and possible areas of thesis inquiry; (3) completed graduate courses; (4) proposed course of study for subsequent semesters; (5) selected graduate papers written by the student; (6) slides or original work if studio inquiry is part of the student's program of study.

*English competence.* At or before the candidacy exam, all candidates for doctoral degrees are required to demonstrate high-level competence in the use of the English language, including reading, writing, and speaking, as part of the requirement for the doctoral program. Competency must be formally attested to by the student's committee before the comprehensive examination is held.

*Course requirements.* All doctoral students are expected to complete the following 3-credit core courses: A ED 502, 505, 536, 588; and A ED 590 (1 credit for each two semesters enrolled in course work).

*Additional Ph.D. requirements.* All Ph.D. students must complete at least 2 continuous semesters of residency after being admitted to candidacy. Although not required by the program, Ph.D. students are strongly encouraged to complete a minor area of study. A foreign language is not required of Ph.D. candidates. Instead, the inquiry and foreign language requirement for the Ph.D. is met through 12 credits of graduate-level course work in a related discipline as determined by the student's committee. All Ph.D. students are required to complete 18 credits of course work in
art education. These 18 credits comprise the core courses plus two other courses in art education at the 400-level or above.

Comprehensive examination. Ph.D. candidates are required to take a written and oral comprehensive examination once their course work is substantially completed. The examination, prepared by the student's doctoral committee, covers all phases of the student's doctoral work both inside and outside the field of art education.

Doctoral dissertation. Ph.D. candidates are required to complete a dissertation on a topic of research approved by the student's doctoral committee. The dissertation must be defended before the academic community at a final oral examination.

Student Aid

Graduate assistantships and other forms of student aid are described in the Student Aid section of the Graduate Bulletin.

Courses

Graduate courses carry numbers from 500 to 599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Last Revised by the Department: Spring Semester 2012

Blue Sheet Item #: 40-07-014

Review Date: 06/12/2012

Faculty updated: 5/12/14
Dual-Title Graduate Degree in Art Education and African American and Diaspora Studies

Admission Requirements
In addition to the admission requirements set forth by the Graduate School and the Art Education Program, students will be admitted to the dual-title degree program in Art Education and African American and Diaspora Studies by approval from an admissions committee in the Art Education Program faculty and African American and Diaspora Studies programs, respectfully. Students can apply to the dual-title program by applying to the Art Education Program, and following admission requirements which include a statement of purpose that addresses their interest in the dual-title graduate degree program in Art Education and African American and Diaspora Studies. Students who are already enrolled in either the Art Education Program or the African American Studies Department can apply directly for admission to the dual-title degree before their admission to candidacy.

General Graduate School requirements are stated in the GENERAL INFORMATION section of the Graduate Bulletin.

PhD Degree
In addition to the required Art Education coursework listed above, students in the dual-title PhD degree must complete the following:

15 credits of coursework related to African American and Diaspora Studies, all at the 500 level or above. Of these 15 credits, 9 must come from the required core course sequence in African American and Diaspora Studies, which comprises the following courses:

AFAM 501 (3 crs) Seminar in African American and Diaspora Studies. This is a foundational graduate survey of the academic field of African American and Diaspora Studies.

AFAM 502 (3 crs) Blacks in the African Diaspora. This is a graduate readings seminar in the theory and history of Blacks in the African Diaspora.

AFAM 503 (3 crs) Sexual and Gender Politics. This is a graduate readings seminar in the theory and history of sexual and gender politics in the Black Diaspora from the Colonial Era forward.

Students must also take 6 elective credits, all of which must come either from the list below or otherwise have the prior approval of the African American and Diaspora Studies supervising faculty. Over time, additional courses may be added to the list of acceptable electives. The director of graduate studies in the Department of African American and Diaspora Studies will maintain a comprehensive list of approved courses. Particular courses may simultaneously satisfy requirements in Art Education and African American and Diaspora Studies. Students who already hold a master's degree from another institution may petition to have equivalent course credits accepted.

AED 522: Participatory Inquiry in the Public Sphere (3)

AED 545: Visual Culture: Race, Class, and Gender (3)
AED 812: Diversity, Visual Culture, and Pedagogy (3)

ART 511: Issues in Contemporary Art (3)

ARTH 416: Topics in American Art (3) [Recent topic: African American Art Since 1900]

ARTH 447: Topics in the Art of the African Diaspora (3)

Foreign Language Requirements
A foreign language is not required of PhD candidates in Art Education. Instead, the inquiry and foreign language requirement for the PhD is met through 12 credits of graduate-level course work in a related discipline as determined by the student's committee. All PhD students are required to complete a minimum of 18 credits of course work in art education. These 18 credits comprise the core courses plus two other courses in art education at the 400-level or above.

Candidacy
The dual-title field must be fully integrated into the candidacy exam for the doctoral program. In addition, candidates for the dual-title PhD in Art Education and African American and Diaspora Studies will be required to conduct a candidacy exam before the end of their second semester in the program and present to their committee a candidacy packet that includes a current CV, a statement that addresses research interests that intersect both areas, a proposed list of courses, and 2-4 writing samples. As described in the Art Education PhD requirements in the Graduate Bulletin, at or before the candidacy exam, all candidates for doctoral degrees are required to demonstrate high-level competence in the use of the English language, including reading, writing, and speaking, as part of the requirement for the doctoral program. Competency must be formally attested to by the student's committee before the comprehensive examination is held. Students must also complete the English language comprehension exam.

Committee Composition
For the dual-title PhD degree, at least one member of the committee must be a member of the African American and Diaspora Studies graduate faculty.

Comprehensive Exams
The African American and Diaspora Studies graduate faculty member on the student's committee is responsible for developing and administering the African American and Diaspora Studies portion of the student's comprehensive exams. The exam must incorporate written and oral components in African American and Diaspora Studies based on the student’s research interest and specialization in African American and Diaspora Studies. The African American and Diaspora Studies portion of the exam may address one or more of the following components: broad history of the field, contemporary theory and debates, and either sexual and gender politics or a topic related to the student’s specific area of interest.

Dissertation
The candidate must complete a dissertation and pass a final oral defense of that dissertation on a topic that reflects their original research and education in both Art Education and African American and Diaspora Studies in order to earn the dual-title PhD degree. The dissertation committee for a dual-title doctoral degree student must include a minimum of four faculty members, i.e., a chair and at least three additional members, all of whom must be members of the Graduate Faculty, and one of which must be on the Graduate Faculty in the Department of African American and Diaspora Studies. If the chair is not faculty in African American and Diaspora Studies, then the committee member representing African American and Diaspora Studies must be appointed as co-chair.
Appendix A: Letters of Support

Paul C. Taylor, Department Head, African American Studies

Graeme L. Sullivan, Director, School of Visual Arts
22 August 2014

Dear Steve,

On behalf of the Department of African American Studies, I am writing to express our enthusiastic support for your efforts to adopt our dual title PhD program. We look forward to working closely with you and your faculty to increase the capacity and expand the reach of our interdisciplinary graduate program. Please let me know if I can do anything to facilitate the process in your department, or if you need me to make this endorsement manifest in some other way.

Sincerely,

Paul C. Taylor
Associate Professor of Philosophy and African American Studies
Head of African American Studies
October 8, 2014

Professor B Stephen Carpenter II,
30F Borland Building
University Park, PA 16802.

Professor Carpenter,

Congratulations to you and the Art Education faculty for all the work that's been put in to develop the collaboration with the Department of African American Studies in adopting their dual title Ph.D. This program initiative adds a definitive component to our graduate curriculum that will not only serve our art education Ph.D. grads, but MFA students whose work explores interdisciplinary perspectives and a diverse embrace of cultural production. Adding another dual title degree to complement our Masters and Ph.D. in Art Education and Women's Studies represents another step in the process of re-configuring our art education graduate program to meet the changing needs and demographics of the diverse cohorts of new students we are attracting.

I look forward to the opportunity to assist in moving this program proposal forward.

Sincerely,

Graeme Sullivan, Ph.D.
Director, Penn State School of Visual Arts
GRADUATE COUNCIL
PROGRAM, OPTION, OR MINOR PROPOSAL FORM

Submit 1 original, signed Graduate Council proposal form and 7 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building. The proposals will be transmitted to the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

See the Program Proposal Procedures for guidance in preparing a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this form, contact the Office of the Dean of the Graduate School.

College/School: Penn State Harrisburg, The Capital College
Department or Instructional Area: School of Public Affairs

NEW GRADUATE PROGRAM, OPTION, OR MINOR: Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code:
Designation of new graduate option:
Designation of new graduate minor:

Indicate effective semester (cannot be earlier than the first semester following approval):

EXISTING GRADUATE PROGRAM, OPTION, OR MINOR: Change × Drop

Current designation of graduate program: Public Administration
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Indicate effective semester (cannot be earlier than the first semester following approval): Fall 2015

SUBMITTED BY GRADUATE PROGRAM HEAD:
Steven Peterson

Printed name
Signature
Date: 12/8/14

NOTE BY COLLEGE/SCHOOL REPRESENTATIVE TO GRADUATE COUNCIL SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES:

Janet Duck

Printed name
Signature
Date: 12/9/14

APPROVED BY COLLEGE/SCHOOL DEAN/CHANCELLOR (OR DESIGNEE):

Peter Idowu

Printed name
Signature
Date: Dec 9, 2014
RECOMMENDED BY CHAIR, GRADUATE COUNCIL SUBCOMMITTEE ON NEW AND REVISED PROGRAMS AND COURSES:

On behalf of Andrew Cole  Dr. Vasilatos-Yunker  Date: 4/22/15

RECOMMENDED BY CHAIR, GRADUATE COUNCIL COMMITTEE ON PROGRAMS AND COURSES:

On behalf of Joan Redwing  Dr. Vasilatos-Yunker  Date: 4/22/15

NOTED BY DEAN OF THE GRADUATE SCHOOL:

Regina Vasilatos-Yunker  Dr. Vasilatos-Yunker  Date: 4/23/15
Master of Public Administration in Public Administration

Program Change Proposal

School of Public Affairs
Penn State Harrisburg
Penn State World Campus

December 4, 2014
CHANGES IN PROGRAMS, OPTIONS*, AND MINORS** (including program name changes)

A. A revised version of the affected area showing both the old program requirements and the
new program requirements (so that the reviewers can determine what specifically is being
changed). The proposal should include a side-by-side comparison of entry requirements,
number of credits required, specific courses to be taken, etc. A copy of the revision to the
Graduate Bulletin copy must be included, and the proposer is requested to use
underlining, bolding, or italics to indicate changes.

See attached

B. A justification for changes made, such as updating instruction, together with an indication
of expected enrollments and any effects on existing programs.

We deleted “Information resource management” as an elective concentration. The
anticipated development of courses appropriate to support the concentration was
not realized. P ADM 506, Management Information Systems, is the sole course
focused on this concentration area.

Consistent with recommendations from our national accrediting body, and as a
result of program development efforts, we removed P ADM 506 from the core of the
MPA program. It does not constitute a core element of Penn State’s MPA program
nor of the heart of the discipline of public administration. We retain it as an elective,
as it is a skill relevant to public administration.

We deleted P ADM 507 as an elective and moved it to the core. The analysis of
public policy and the understanding of the policy process is a key element of public
administration and should be required of our MPA students. This move is consistent
with accrediting guidelines and the state of the field.

The graduate faculty listing has been changed, to note changes in personnel.

C. Include written response from departments affected by the changes.
CURRENT VERSION

Public Administration (P ADM)

https://harrisburg.psu.edu/public-affairs/public-administration/master-public-administration

JEREMY F. PLANT, MPA Coordinator
Penn State Harrisburg
777 W. Harrisburg Pike
W-160 Olmsted Building
Middletown, PA 17057

Degrees Conferred:
M.P.A., Ph.D.

The Graduate Faculty

- Beverly A. Cigler, Ph.D. (Penn State) Professor of Public Policy and Administration
- Cynthia Massie Mara, Ph.D. (Virginia Tech) Associate Professor of Health Care Administration and Policy
- Goktug Morcol, Ph.D. (Virginia Polytechnic Institute and State University) Associate Professor of Public Administration
- Jeremy F. Plant, Ph.D. (Virginia) Professor of Public Policy and Administration
- Bing Ran, Ph.D. (Waterloo) Assistant Professor of Public Administration
- Odd J. Stalebrink, Ph.D. (George Mason) Associate Professor of Public Administration
- Triparna Vasavada, Ph.D. (SUNY-Albany) Assistant Professor of Public Administration
- James T. Ziegenfuss, Jr., Ph.D. (Pennsylvania/Wharton) Professor of Management and Health Care Systems

MPA Program

The Master of Public Administration (MPA) program is intended for those with career interests in public management, health and human services, government, and other public service and nonprofit organizations. The curriculum blends theoretical and applied concepts and assures “real-world” experiences for the novice administrator. In addition, it requires that students devote attention to general professional development. The MPA program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA).

FULL-TIME OR PART-TIME--Students may begin the program in any semester. Three courses (or 9 credits) per semester are considered a normal course load for full-time students. Part-time students typically take one or two 3-credit courses each semester and one or two courses during the summer session to maintain steady progress toward the degree. The program, including an
internship in a public agency or nonprofit organization for those without three years of managerial, supervisory, or professional experience, requires eighteen to twenty-four months of full-time study, or three to five years on a part-time basis.

**Admission Requirements**

Applicants must hold either (1) a bachelor's degree from a U.S. regionally accredited institution or (2) a postsecondary degree that is equivalent to a U.S. baccalaureate degree earned from an officially recognized degree-granting international institution prior to starting the graduate program. Applicants who are still completing their baccalaureate requirements at the time of application may be admitted to the Graduate School conditional on the awarding of the baccalaureate degree.

Admission to the MPA program is based on clear suitability for the program as demonstrated by the application as a whole, including the following: a completed application with the application fee; evidence of a bachelor's degree from a regionally accredited college; a statement of career and educational goals; a successful undergraduate record with a grade-point average of 3.00 or better (either as the cumulative GPA or for the last 60 hours of relevant course work); satisfactory scores on the Graduate Record Examination (GRE), Graduate Management Admission Test (GMAT), or Law School Admission Test (LSAT) if the GPA is less than 3.0; and three references, willing to provide recommendations.

**Degree Requirements**

The MPA degree program requires 36 graduate credits—18 in core courses, 15 in electives, and 3 for the research project. Up to 6 credits of 400-level courses may be taken as electives, with the approval of an adviser. In addition, a 3-credit internship is required of students who do not have at least two years of full-time relevant work experience that consists of supervisory, managerial, or professional work. The internship is waived for students with this experience before they enter the program or who gain it during the program.

**REQUIRED CORE COURSES** (18 credits)

| P ADM 500, P ADM 502, P ADM 503, P ADM 505, P ADM 5076, P ADM 510 |

**ELECTIVE CONCENTRATION AREA** (15 credits)

With the faculty adviser's approval, a student selects 15 credits of electives from the courses list. Students also have the option of taking elective courses from one of the following concentrations: Government Administration, Health Care Management and Policy, Human Resources Management, Information Resource Management, Policy Analysis, and Criminal Justice, as well as the general Public Administration degree.

Examples of suitable elective courses: P ADM 507, P ADM 511, P ADM 512, P ADM 514, P ADM 515, P ADM 516, P ADM 522, P ADM 523, P ADM 524, P ADM 531, P ADM 532, P
ADM 533, P ADM 534, P ADM 535, P ADM 550, P ADM 556, P ADM 557, P ADM 558, CRIMJ 563, CRIMJ 564, and CRIMJ 565. Courses listed under the Master of Health Administration program may also be taken: H ADM 539, H ADM 540, H ADM 541, H ADM 542, H ADM 543, H ADM 545, H ADM 546, H ADM 548, H ADM 551, H ADM 552.

RESEARCH PROJECT--P ADM 594

INTERNSHIP IN PUBLIC ADMINISTRATION--P ADM 595 (if required)
REVISED VERSION

Public Administration (P ADM)

https://harrisburg.psu.edu/public-affairs/public-administration/master-public-administration

JEREMY F. PLANT, MPA Coordinator
Penn State Harrisburg
777 W. Harrisburg Pike
W-160 Olmsted Building
Middletown, PA 17057

Degrees Conferred:

M.P.A., Ph.D.

The Graduate Faculty

- Jane Beckett-Camarata, Ph.D. (Virginia Commonwealth) Senior Lecturer in Public Administration
- Beverly A. Cigler, Ph.D. (Penn State) Professor of Public Policy and Administration
- Cynthia Massie Mara, Ph.D. (Virginia Tech) Associate Professor of Health Care Administration and Policy
- John Kim, Ph.D. (SUNY-Binghamton) Senior Lecturer in Public Administration
- Goktug Morcol, Ph.D. (Virginia Polytechnic Institute and State University) Associate Professor of Public Administration
- Steven Peterson, Ph.D. (SUNY-Buffalo), Professor of Public Affairs
- Jeremy F. Plant, Ph.D. (Virginia) Professor of Public Policy and Administration
- Bing Ran, Ph.D. (Waterloo) Assistant Professor of Public Administration
- Glenn Silverstein, Ph.D. (Delaware) Lecturer in Public Administration
- Odd J. Stalebrink, Ph.D. (George Mason) Associate Professor of Public Administration
- Triparna Vasavada, Ph.D. (SUNY-Albany) Assistant Professor of Public Administration
- Aaron Waehnau, Ph.D. (Penn State) Lecturer in Public Administration
- James T. Ziegeltuss, Jr., Ph.D. (Pennsylvania/Wharton) Professor of Management and Health Care Systems

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FULL-TIME OR PART-TIME--Students may begin the program in any semester. Three courses (or 9 credits) per semester are considered a normal course load for full-time students. Part-time students typically take one or two 3-credit courses each semester and one or two courses during the summer session to maintain steady progress toward the degree. The program, including an internship in a public agency or nonprofit organization for those without three years of managerial, supervisory, or professional experience, requires eighteen to twenty-four months of full-time study, or three to five years on a part-time basis.

Admission Requirements

Applicants must hold either (1) a bachelor's degree from a U.S. regionally accredited institution or (2) a postsecondary degree that is equivalent to a U.S. baccalaureate degree earned from an officially recognized degree-granting international institution prior to starting the graduate program. Applicants who are still completing their baccalaureate requirements at the time of application may be admitted to the Graduate School conditional on the awarding of the baccalaureate degree.

Admission to the MPA program is based on clear suitability for the program as demonstrated by the application as a whole, including the following: a completed application with the application fee; evidence of a bachelor's degree from a regionally accredited college; a statement of career and educational goals; a successful undergraduate record with a grade-point average of 3.00 (either as the cumulative GPA or for the last 60 hours of relevant course work); satisfactory scores on the Graduate Record Examination (GRE), Graduate Management Admission Test (GMAT), or Law School Admission Test (LSAT) if the GPA is less than 3.0; and three references willing to provide recommendations.

Degree Requirements

The MPA degree program requires 36 graduate credits—18 in core courses, 15 in electives, and 3 for the research project. Up to 6 credits of 400-level courses may be taken as electives, with the approval of an adviser. In addition, a 3-credit internship is required of students who do not have at least two years of full-time relevant work experience that consists of supervisory, managerial, or professional work. The internship is waived for students with this experience before they enter the program or who gain it during the program.

REQUIRED CORE COURSES (18 credits)

P ADM 500, P ADM 502, P ADM 503, P ADM 505, P ADM 506, P ADM 507, P ADM 510

ELECTIVE CONCENTRATION AREA (15 credits)
With the faculty adviser's approval, a student selects 15 credits of electives from the courses list. Students also have the option of taking elective courses from one of the following concentrations/areas of interest: Government Administration, Health Care Management and Policy, Homeland Security, Human Resources Management, Information Resource Management, Policy Analysis, and Criminal Justice, as well as the general Public Administration degree.

Examples of suitable elective courses: **P ADM 506, P ADM 507, P ADM 511, P ADM 512, P ADM 514, P ADM 515, P ADM 516, P ADM 522, P ADM 523, P ADM 524, P ADM 531, P ADM 532, P ADM 533, P ADM 534, P ADM 535, P ADM 550, P ADM 556, P ADM 557, P ADM 558, CRIMJ 563, CRIMJ 564, and CRIMJ 565.** Courses listed under the Master of Health Administration program may also be taken: H ADM 539, H ADM 540, H ADM 541, H ADM 542, H ADM 543, H ADM 545, H ADM 546, H ADM 548, H ADM 551, H ADM 552.

**RESEARCH PROJECT--P ADM 594**

**INTERNSHIP IN PUBLIC ADMINISTRATION--P ADM 595 (if required)**
Consultation Record

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<th>Date contacted</th>
<th>Date responded</th>
<th>Comments (see attached)</th>
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<td>Catherine Surra, PSH - BSED</td>
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<tr>
<td>Diane McLaughlin, AESE - CDEV</td>
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</table>

Re: MPA program change

April 17, 2014 3:41 PM

From: Steve Schappe
To: Aaron Wachhaus

Aaron,

Thanks for the opportunity to look over your proposed changes for the MPA; I've attached a formal letter of support.

Good luck with the consultation and approval process.

Regards,
Steve

School of Business Administration

777 W. Harrisburg Pike
Middletown, PA 17057-4898
717-948-6139

Date: April 17, 2014

From: Stephen P. Schappe, Director
To: Aaron Wachhaus
MPA Coordinator

Subj: Proposed Changes to Master of Public Administration Program

Thank you for the opportunity to review your school's proposed changes to the Master of Public Administration program.
The justifications you provide for the proposed changes to the program’s required and elective courses are reasonable. Should MPA students have the opportunity to take elective courses from other programs to complete their requirements, our business school would welcome graduate students from this program in our courses.

The School of Business Administration is pleased to support your proposal and your efforts.

Re: MPA program change

April 21, 2014 1:54 PM

From: LEE ANN BANASZAK

To: Aaron Wachhaus

Hi Aaron,

My apologies for the delay in getting back to you. The Department of Political Science at University Park would not be affected by these policy changes and so I see no problem with these adjustments.

Good luck with the process.

Hope that helps.

Lee Ann

RE: MPA program change

April 22, 2014 8:55 AM

From: Diane McLaughlin

To: Aaron Wachhaus

Hi Aaron,

Sorry for the delay. My comment is below and included on the document. I did find one typo on page 4. I highlighted the extra 'e' in degree under admission requirements.

Comment from Diane K. McLaughlin, CEDEV Graduate Program Coordinator: This change in one core course becoming an elective and one elective course being switched to a core course does not affect whether the courses are offered and so likely will have little impact on other programs, such as the MPS in Community and Economic Development (CEDEV). CEDEV suggests P ADM courses to our students as possible elective courses. I support this proposed change and think that making P ADM 507 Introduction to Public Policy Analysis a core course in P ADM will strengthen the program. It would seem to be a central course for anyone earning a Master’s degree in Public Administration.
Re: MPA program change  

From: CATHERINE ANN SURRA  
To: Aaron Wachhaus  

BSED has no objections to these changes, Aaron. I consulted all programs in the school and heard specifically from the HLHED Master Degree program and the Applied Clinical Psychology program. Good luck.

Catherine A. Surra  
Director, School of Behavioral Sciences and Education  
Professor, Human Development and Family Studies, and Emeritus Professor, University of Texas at Austin  
Penn State Harrisburg  
W-319 Olmsted Bldg  
777 W Harrisburg Pike  
Middletown, PA 17057-4898  
717.948.6205
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Engineering
Department or Instructional Area: Department of Industrial and Manufacturing Engineering

New Graduate Program, Option, or Minor: [ ] Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code: __________
Designation of new graduate option: ____________________________
Designation of new graduate minor: ____________________________

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Existing Graduate Program Option, or Minor: [ ] Change [ ] Drop

Current designation of graduate program:
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Add a non-thesis track to the existing M.S. in Industrial Engineering and drop the existing M.Eng in Industrial Engineering

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Submitted by Graduate Program Head

[Signature]

Date: 10/24/14

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

[Signature]

Date: 10/21/14

Approved by College/School Dean/Chancellor (or Designee):

[Signature]

Date: 11/21/14
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On behalf of C. Andrew Cole  
Printed name  
Signature  
Date: 4/22/15

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On behalf of Joan Rodriguez  
Printed name  
Signature  
Date: 4/22/15

Noted by Dean of the Graduate School:

Regina Vasilatos-Younker  
Printed name  
Signature  
Date: 4/23/15
PROPOSAL TO ADD A NON-THESIS TRACK TO THE CURRENT MASTER OF SCIENCE DEGREE IN INDUSTRIAL ENGINEERING AND DROP THE MASTER OF ENGINEERING DEGREE IN INDUSTRIAL ENGINEERING

DEPARTMENT SUBMITTING THE PROPOSAL:
DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

CONTACT INFORMATION: PAUL GRIFFIN, HEAD
Email: pmg14@psu.edu
Telephone: 814-865-7601

ADDITIONAL CONTACT: JEYA CHANDRA, PROFESSOR
Email: mjc3@psu.edu
Telephone: 814-863-2358

COLLEGE AFFILIATION:
COLLEGE OF ENGINEERING
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
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</tr>
</thead>
<tbody>
<tr>
<td>a. Justification for the proposed changes</td>
<td>3</td>
</tr>
<tr>
<td>b. Admission Requirements</td>
<td>5</td>
</tr>
<tr>
<td>c. Proposed Degree Requirements</td>
<td>6</td>
</tr>
<tr>
<td>d. Proposed Changes in the Graduate Bulletin</td>
<td>10</td>
</tr>
<tr>
<td>e. Consultations</td>
<td>22</td>
</tr>
</tbody>
</table>
a. Justification for the proposed changes

The current MS degree with thesis track requires a total of 32 credits consisting of 24 credits of coursework, two credits of colloquium and six credits of research/thesis. The current MENG degree requires a total of 30 credits consisting of 27 credits of coursework, one credit of colloquium and two credits of research/paper. Most of the students seeking the MENG degree complete this within three to four semesters. On the other hand, most of the students seeking the current MS degree with thesis track take at least four semesters to complete this degree, as shown in Table 1 given below.

Table 1. Median Time to Degree in Industrial Engineering

<table>
<thead>
<tr>
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The main reason for this is the time required to complete six credits of research and the resulting thesis. Despite this, more Masters students in the department seek the MS degree. Out of the 177 graduate students in the department in Spring 2014, 89 students are seeking their Master’s degree out of which 59 students (66%) are MS. Students and 30 (33%) are MENG students. Our current MENG degree does not include business-related courses dealing with project management, marketing/communication skills etc. The students enrolled in the current MENG degree choose from the same selection of courses taken by students enrolled in the current MS degree with thesis track. It can be seen that the MS degree is sought out by more students over the MENG degree. The proposed MS degree with non-thesis track will require a total of 32 credits consisting of 27 credits of coursework, two credits of colloquium and three credits of research/paper. This proposed MS degree with non-thesis track will help the students who seek the MS
degree, by potentially shortening the required time to complete the degree within 12 months – Fall, Spring and Summer. We want to eliminate the current Master of Engineering degree, because the proposed MS degree in Industrial Engineering will make our graduates very competitive if they choose to go to industry, and it still allows them to continue to pursue a PhD. As pointed out earlier, a larger percentage of the current students seeking masters degree in the department prefer the current MS degree with thesis track. Hence, we expect that the demand for the current MENG degree will decrease, after we start offering the MS degree with non-thesis track. It is optimal for our department to allocate more resources to the MS degree with non-thesis track, rather than to the MENG degree, for the reasons stated earlier. Also, the credit requirements for the current MENG degree and the proposed MS degree with non-thesis track are very similar.

The study of the top IE graduate programs listed in *US News and World Report*, such as, Georgia Tech, Michigan, Northwestern, Berkeley, Stanford, MIT, and Cornell, indicate several points. Although Northwestern does not offer a direct-admit MS, all of the other programs listed offer MS degrees in Industrial Engineering which can be completed within 2 to 3 semesters. None of these programs offer MENG degrees and most of the MS degrees offered do not require a culminating experience. Although we certainly see value in having a meaningful culminating experience for our students, which increases the quality of our MS degree, it is also very helpful to our students if they complete their degrees in a timely manner. Having a MS degree with non-thesis track will allow us to effectively do this. Moreover, the highest performing one-year MS candidates could be recruited into the PhD program. The MENG degree is often considered a terminal degree and is not widely recognized as a preparatory degree for the PhD program.

We expect the enrollment of students seeking the Master’s degree to go up to 100 per year, out of which most students (at least 70) will seek the proposed MS degree with non-thesis track.

The target or primary audience for these programs is (1) continuing students from PSU immediately after their BS, (2) continuing students from other institutions immediately after their BS, and (3) international students. High performing students, either domestic coming from other institutions or international, could then apply for the PhD program, given they will have an MS degree.

We believe that having a MS with non-thesis track will allow us to be more competitive at attracting high performing domestic students who are currently going to accelerated programs such as Georgia Tech and Stanford.

b. **Admission Requirements**
The students seeking the current MS degree with thesis track, or the PhD degree will be admitted in Fall or Spring semesters. However, students seeking the proposed MS degree with non-thesis track will be admitted only in the Fall semester each year.

The admission requirements for the proposed MS degree with non-thesis track are the same as those for the current MS degree with thesis track. These are as follows:

Scores from the Graduate Record Examination (GRE) are required for admission. In addition, an applicant must have received a baccalaureate degree from a regionally accredited institution. Graduates in engineering, physical sciences, and mathematics who present a 3.00 grade-point average will be considered for admission.

All international applicants must submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). The minimum composite score for the IELTS is 6.5.

International applicants who have received a baccalaureate or Master’s degree from a college, university, or institution in any of the following countries are exempt from the TOEFL requirement: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, or Wales.

c. Proposed Degree Requirements

<table>
<thead>
<tr>
<th></th>
<th>CURRENT MS DEGREE WITH THESIS TRACK</th>
<th>BREAKDOWN OF COURSE CREDITS</th>
<th>PROPOSED MS DEGREE WITH NON-THESIS TRACK</th>
<th>BREAKDOWN OF COURSE CREDITS</th>
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<tr>
<td>MINIMUM NUMBER OF 500 LEVEL COURSE CREDITS</td>
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<td>18 out of 27 credits</td>
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<td>IE 600</td>
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<tr>
<td>TOTAL NUMBER OF CREDITS</td>
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</table>

The students seeking the Master of Science degree in Industrial Engineering with non-thesis track will begin pursuing their degree in the fall semester. Most students will complete their degrees including all the required coursework and the three credits of culminating research resulting in a paper and graduate by the end of summer following the second semester. Although the program is set up as a three semester program, it is recognized that the completion of the scholarly paper may take a longer period of time. Therefore, students need not graduate within a year, and would also be allowed to complete the scholarly paper off-campus. For the typical student, the proposed plan of study is as follows:

- Fall semester: Twelve credits of course work, one credit of colloquium, and one credit of research (IE 596)
- Spring Semester: Twelve credits of coursework, one credit of colloquium, and one credit of research (IE 596)
- Summer semester: Three credits of course work and one credit of research (IE 596).
The proposed MS degree with non-thesis track is still an academic degree and the three credits of research resulting in a paper will satisfy the Graduate Council requirement of the culminating experience. This requires the student to select a department faculty member as an adviser during the Fall semester, depending upon the research interests of the student and the faculty member and register for one credit of research paper as IE 596 during the fall, spring, and summer semesters, under the student’s adviser. The type and scope of the culminating project resulting in a paper has to be specified by the student's research adviser. The paper must demonstrate the capability of the student to integrate and apply concepts and techniques learned in the courses to solve an engineering problem. The electronic copy of the approved culminating research paper must be submitted to the department at least two weeks before the end of their terminal semester (which will be the summer for a typical student). This scholarly paper will be made publically available through posting on ScholarSphere (https://scholarsphere.psu.edu).

Core Courses:

In addition to the above-mentioned credit requirements, the department will introduce core courses to satisfy the following Graduate Council requirement.

“At least one-fourth of the total number of course credits required for a major with options (rounding down to the nearest whole number) must be common to all students in the major; this constitutes a “core”, regardless of the option selected.”

Current MS degree with thesis track: ¼ *(24 course credits) = 6 \rightarrow two courses as core courses.

MS degree with non-thesis track – to be added: ¼ * 27 course credits = 6.75 \rightarrow rounded down to 6 credits \rightarrow two courses as core courses.

It is proposed to designate the following two new courses as core courses for both the MS degree with thesis track and the MS degree with non-thesis track.

1) IE 505: Linear Programming
2) IE 511: Experimental Design in Engineering

Option Requirements

The Graduate Council Policy states that each option in a graduate degree requires at least a certain minimum number of specific course credits that are distinct to that option. The minimum number of these option-specific credits is the lesser of 18 credits or 1/3 of the total number of course credits required for the degree (rounding down to the nearest whole number), exclusive of credits associated with the culminating experience (thesis/ paper credits).

Current MS degree with thesis track: 1/3 *(24 course credits) = 8.0 \rightarrow three courses as option-specific courses.

MS degree with non-thesis track – to be added: 1/3 *(27 course credits) = 9.0 \rightarrow three courses as option-specific courses.
The department will offer three options for the MS degree with thesis and non-thesis tracks, which are:

- Manufacturing Engineering
- Human Factors/Ergonomics Engineering
- Quality Engineering

These three options will not be available for the current PhD degree in Industrial Engineering.

The option-specific courses for the MS degree with thesis and non-thesis tracks are given below:

**Manufacturing Engineering:**
All the three following courses (9 credits):
- IE 528  Metal Cutting Theory
- IE 550  Manufacturing Systems
- IE 563  Computer - Aided Design for Manufacturing

**Human Factors / Ergonomics Engineering**
All the three following courses (9 credits):
- IE 549  Design Decision Making
- IE 553  Engineering of Human Work
- IE 558  Engineering of Cognitive Work

**Quality Engineering:**
All the three following courses (9 credits)
- IE 555  Statistical Process Monitoring and Analysis
- IE 566  Quality Control
- IE 583  Response Surface Methodology and Process Optimization

**Base Program:** The base masters program in Industrial Engineering, which any student seeking a Masters degree in Industrial Engineering without any specific option will undergo, consists of the two core courses listed below:
1) IE 505: Linear Programming  
2) IE 511: Experimental Design in Engineering

These two courses teach all of the students’ basic knowledge of optimization, design of engineering experiments and the statistical analysis of the resulting data. These topics are important for all industrial engineers to know. In addition, the students will take at least four more three-credit courses in Industrial Engineering out of which at least three courses will be at the 500-level. These courses will further enhance the knowledge of industrial engineering topics for all the students seeking the Masters degrees. Also, all the students have to take two credits of colloquium in which invited speakers give talks on theory and applications of industrial engineering.

PROPOSED CHANGES IN THE GRADUATE BULLETIN

Industrial Engineering (I E)

Program Home Page

PAUL M. GRIFFIN, Head of the Harold and Inge Marcus Department of Industrial and Manufacturing Engineering  
310 Leonhard Building  
814-865-7601

Degrees Conferred:

M. Eng., M.S., Ph.D.

M.S., Ph.D.

The Graduate Faculty

Graduate study and research are conducted in manufacturing process, information engineering operations research-management science, production engineering, process design, systems engineering, human factors, ergonomics, quality engineering, and robotics.

Graduate study and research are conducted in manufacturing process, information engineering operations research management science, production engineering, process design, systems engineering, human factors, ergonomics, quality engineering, and robotics.

Admission Requirements

Scores from the Graduate Record Examinations (GRE), or from a comparable substitute examination accepted by a graduate program and authorized by the dean of the Graduate School,
are required for admission, at the discretion of a graduate program, a student may be admitted provisionally for graduate study in a program without these scores. Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.

To be admitted into the program, an applicant must have received a baccalaureate degree from a regionally accredited institution. Graduates in engineering, physical sciences, and mathematics who present a 3.00 grade-point average will be considered for admission. For all international students whose native language is not English, scores from the Test of English as a Foreign Language (TOEFL) are required with a minimum score of 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 20 on the speaking section for the Internet-based test required for admission. The best-qualified applicants will be accepted up to the number of spaces that are available for new students. Exceptions to the minimum 3.00 grade-point average may be made for students with special backgrounds, abilities, and interests.

Scores from the Graduate Record Examination (GRE) are required for admission. To be admitted into the program, an applicant must have received a baccalaureate degree from a regionally accredited institution. Graduates in engineering, physical sciences, and mathematics who present a 3.00 grade-point average will be considered for admission.

All international applicants must submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System), with the exceptions noted below. The minimum acceptable score for the TOEFL is 550 for the paper-based test, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). The minimum composite score for the IELTS is 6.5.

International applicants who have received a baccalaureate or Master’s degree from a college, university, or institution in any of the following countries are exempt from the TOEFL requirement: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, or Wales.

Degree Requirements

Three degrees are offered: Master of Engineering (M.Eng.), Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.).

Two degrees are offered: Master of Science (M.S.) with thesis and non-thesis tracks and the Doctor of Philosophy (Ph.D.).

The M.Eng. is a professional degree program aimed at preparing students with a breadth of technical and managerial skills to make significant immediate contributions in an industrial setting. The degree requirements include 27 credits of course work, one credit of IE 590 (Colloquium), and a scholarly paper for which two credits of IE 596 (Individual Studies) must be taken. Of the 27 credits of required course work, at least 18 must be prefixed IE, and at least
15 must be at the 500 level. Of the 15 credits at the 500 level, at least 12 must be in IE courses.

The scholarly paper must demonstrate comprehensive and in-depth knowledge of a topic in industrial engineering, and it should be suitable for submission for publication in a refereed journal as approved by the committee.

The M.S. degree program is intended for students to gain advanced knowledge for research, analysis, and design in industrial engineering. The degree requirements include 24 credits of course work and two IE 590 (Colloquium) credits. Of the 24 credits of required course work, at least 15 must be prefixed IE, and at least 12 must be at the 500 level. Of the 12 credits at the 500 level, at least nine must be IE courses. A thesis is required, for which six credits of IE 600 or IE 610 must be taken.

The M.S. degree program is intended for students to gain advanced knowledge for research, analysis, and design in industrial engineering. The M.S. degree is offered with thesis or research paper tracks, both requiring 32 credits. The M.S. degree with thesis track requires 24 credits of coursework and two credits of IE 590 (Colloquium). Out of the 24 credits of coursework, at least 15 must be IE courses, and at least 12 must be at the 500 level. Of the 12 credits at the 500 level, at least nine must be IE courses. A thesis is required, for which six credits of IE 600 or IE 610 must be taken. The M.S. degree with non-thesis track requires 27 credits of coursework, two credits of IE 590 (Colloquium). Out of the 27 credits of coursework, at least 18 must be IE courses, and at least 18 must be at the 500 level. Of the 18 credits at the 500 level, at least fifteen must be IE courses. A scholarly paper is required for the MS degree with non-thesis track for which three credits of IE 596 must be taken. For both tracks, a core curriculum is required that is composed of IE 505 (Linear Programming) (3 credits) and IE 511 (Experimental Design in Engineering) (3 credits), which all the students must satisfy. The thesis must demonstrate comprehensive and in-depth knowledge of a topic in industrial engineering, and it should be suitable for submission for publication in a refereed journal as approved by the committee. The paper should demonstrate the ability of the student to integrate and apply concepts and techniques learnt in the courses to solve an engineering problem.

The students seeking the Master of Science degree in Industrial Engineering with non-thesis track are expected to start their degree in the Fall semester of every year and complete their degree including all the required coursework and three credits of research resulting in a paper and graduate by the end of summer following the second semester. Students who cannot complete their research paper by this summer can graduate after the summer. The plan of study is as follows:

- **Fall semester:** Twelve credits of course work, one credit of colloquium and one credit of research (IE 596).
- **Spring semester:** Twelve credits of coursework, one credit of colloquium and one credit of research (IE 596).
- **Summer semester:** Three credits of coursework and one credit of research (IE 596).
For the M.Eng. and M.S. degrees, area options are available in Human Factors/Ergonomics Engineering, Manufacturing Engineering and Quality Engineering. M.Eng. and M.S. dual-title degree programs in Industrial Engineering and Operations Research are also offered.

For the M.S. degree, area options are available in Human Factors/Ergonomics Engineering, Manufacturing Engineering and Quality Engineering. M. S. dual-title degree program in Industrial Engineering and Operations Research is also offered.

The Ph.D. program emphasizes scholarly research, and prepares students for research and development careers in industry, government, and academe. Students are admitted to candidacy after passing a written examination. The Ph.D. is awarded upon completion of a program of advanced study that includes a minimum period of residence, passing the English proficiency and comprehensive examinations, completing a satisfactory dissertation, and passing the final oral examination. The degree requirements consist of 45 credits of course work and four I E 590 (Colloquium) credits. Of the 45 credits of required course work, 36 must be prefixed I E, and at least 30 must be at the 500 level. Nine credits must be from outside the Department and must include a six-credit sequence, with at least three credits at the 500 level. A Ph.D. dual-title degree program in Industrial Engineering and Operations Research is also available.

Continuous registration is required for all graduate students until the paper, thesis, or dissertation is approved.

Master of Engineering (M.Eng.) Degree – Human Factors/Ergonomics Engineering Option

To receive the M.Eng. degree in Industrial Engineering with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 30 credits beyond the bachelor's degree: 27 credits of course work, 1 credit of colloquium, and 2 credits of individual studies leading to a scholarly paper, as required for the M.Eng. degree in Industrial Engineering.

The 30 credits for the Option in Human Factors/Ergonomics Engineering must include the following:

I. CORE REQUIREMENT

1. Experimental Design (3 credits)

INDUSTRIAL ENGINEERING (I E)
511. Experimental Design in Engineering

II. ELECTIVES
1. Human Factors—Any three courses from the following list: (9 credits)

**INDUSTRIAL ENGINEERING (I E)**
552. Mechanics of the Musculoskeletal System
553. Engineering of Human Work
558. Engineering of Cognitive Work
Any of these courses may be substituted by other suitable I E 500-level courses, subject to the approval of the IME Graduate Faculty.

2. Industrial Engineering (6 credits)

Any two I E courses approved for graduate credit.

3. Any three courses from the following list; at least one course must be at the 500 level. (9 credits)

**BIOENGINEERING (BIOE)**
507. Biomedical Signal Processing

**INDUSTRIAL HEALTH AND SAFETY (I H S)**
445. Industrial Hygiene & Toxicology
447. Industrial Hygiene Measurements
450. Environmental Health & Safety
470 Analytical Methods for System Safety

**KINESIOLOGY (KINES)**
565. Neurophysiological Basis of Movement
574. Modeling in Biomechanics
578. Physiology & Mechanical Behavior of Skeletal Tissues
579. Advanced Biomechanics of Human Motion

**PSYCHOLOGY (PSYCH)**
453. Sensation & Perception
456. Advanced Cognitive Psychology
458. Visual Cognition
462. Physiological Psychology

III. Colloquium (1 credit)

I E 590. Colloquium (or 1 credit of O R 590)

IV. Individual Studies (2 credits)

I E 596 Individual Studies
Master of Engineering (M.Eng.) Degree – Manufacturing Engineering Option

To receive the M.Eng. degree in Industrial Engineering with an Option in Manufacturing Engineering, a student must complete at least 30 credits beyond the bachelor’s degree: 27 credits of course work, 1 credit of colloquium, and 2 credits of individual studies leading to a scholarly paper, as required for the M.Eng. degree in Industrial Engineering.

The 30 credits required for the Option in Manufacturing Engineering must include the following:

I. CORE REQUIREMENT

INDUSTRIAL ENGINEERING (I E) (9 credits)
511. Experimental Design in Engineering
550. Manufacturing Systems
582. Information Technology for Industrial & Manufacturing Engineering

II. ELECTIVES

1. Students must take at least one course from each of the following four groups; at least two courses must be at the 500 level:

   a. Materials and Manufacturing Processes
   INDUSTRIAL ENGINEERING (I E)
   428. Metal Casting
   438. Metal Cutting Principles & Practices
   518. Materials, Forming Processes & Quality
   528. Metal Cutting Theory
   538. Experimental Investigation in Materials Processing
   561. Weld Design
   580. Analysis of Machining Precision

   b. Process, Assembly and Product Engineering
   INDUSTRIAL ENGINEERING (I E)
   464. Assembly of Printed Circuit Boards
   563. Computer-Aided Design for Manufacturing
   576. Computer-Aided Tolerancing in Design & Manufacturing
   579. Designing Product Families

   c. Manufacturing Productivity and Quality
   INDUSTRIAL ENGINEERING (I E)
   402. Advanced Engineering Economy
   456. Industrial Robot Applications
   507. Operations Research: Scheduling Models
   551. Computer Control of Manufacturing Systems
553. Engineering of Human Work
556. Robotic Concepts
558. Engineering of Cognitive Work
566. Advanced Quality Control

d. Manufacturing Integration Methods for Systems Design
INDUSTRIAL ENGINEERING (I E)
455. Production Planning & Control
505. Linear Programming
509. Operations Research: Waiting Line Models
521. Non-Linear Programming
522. Discrete Event Systems Simulation
532. Reliability Engineering
540. Manufacturing Systems Simulation
554. Production Planning & Control
562. Expert Systems Design in Industrial Engineering
578. Using Simulation Models for Design

2. Any two I E or non-I E courses approved for graduate credit. See "IME List of Approved
Non-I E Courses—All Options" (attached) (6 credits)

III. Colloquium (1 credit)
I E 590 Colloquium (or 1 credit of O R 590)

IV. Individual Studies (2 credits)
I E 596 Individual Studies

Master of Engineering (M.Eng.) Degree—Quality Engineering Option

To receive the M.Eng. degree in Industrial Engineering with an Option in Quality Engineering, a
student must complete at least 30 credits beyond the bachelor's degree: 27 credits of course
work, 1 credit of colloquium, and 2 credits of individual studies leading to a scholarly paper, as
required for the M.Eng. degree in Industrial Engineering.

I. CORE REQUIREMENT

INDUSTRIAL ENGINEERING (I E)
511. Experimental Design in Engineering

II. ELECTIVES

1. Any three courses from the following list: (9 credits)
INDUSTRIAL ENGINEERING (I E)
532. Reliability Engineering
566. Quality Control
576. Computer-Aided Tolerancing in Design and Manufacturing
583. Response Surface Methodology and Process Optimization
584. Time Series Control and Process Adjustment

2. Any one course from the following list: (3 credits)

STATISTICS (STAT)
500. Applied Statistics
505. Applied Multivariate Statistical Analysis
506. Sampling Theory and Methods
511. Regression Analysis and Modeling
512. Design and Analysis of Experiments

3. Any two I E courses from the following list; of which at least one course must be at the 500 level: (6 credits)

INDUSTRIAL ENGINEERING (I E)
454. Applied Decision Analysis
468. Optimization Modeling and Methods
505. Linear Programming
516. Applied Stochastic Processes
519. Dynamic Programming
520. Multiple Criteria Optimization
521. Nonlinear Programming

4. Any two I E or non-I E courses approved for graduate credit. See *"IME List Of Approved Non-I E Courses-All Options" (attached). (6 credits)

III. Colloquium (1 credit)
IE 590 Colloquium (or 1 credit of O R 590)

IV. Individual Studies (2 credits)
IE 596 Individual Studies

*IME List of Approved Non-I E Courses – All Options
(The material covered in a course already taken should not be duplicated.)

500 LEVEL: Any courses, subject to approval by the Graduate Program Coordinator

400 LEVEL:
BIOE 419
CMPEN 362, CMPSC 431W, CMPSC 456, CMPSC 468
EMCH 461
ENGR 411, ENGR 407
FD SC 430
I H S 430, I H S 445, I H S 447, I H S 450, I H S 470
MATH 451, MATH 456, MATH 485, MATH 486
MATSE 425, MATSE 450
M I S 431, M I S 479W
MKTG 437
PHIL/S T S 432 (for students interested in health systems)
PSYCH 413, PSYCH 456, PSYCH 458, PSYCH 462
SCM 450W, SCM 430, SCM 435
STAT 460, STAT 464
W P 416

Master of Science (M.S.) Degree with thesis and non-thesis tracks- Human Factors/Ergonomics Engineering Option

To receive the M.S degree in Industrial Engineering with thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 24 credits of course work, 2 credit of colloquium, and 6 credits of research leading to a thesis, as required for the M.S. degree in Industrial Engineering with thesis track. To receive the M.S degree in Industrial Engineering with non-thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 27 credits of course work, 2 credit of colloquium, and 3 credits of research leading to a scholarly paper, as required for the M.S. degree in Industrial Engineering with non-thesis track.

The course credits for the Option in Human Factors/Ergonomics Engineering must include the following:

All the following three courses: (9 credits)

IE 549    Design Decision Making
IE 553    Engineering of Human Work
IE 558    Engineering of Cognitive Work

Master of Science (M.S.) Degree with thesis and non-thesis tracks- Manufacturing Engineering Option
To receive the M.S degree in Industrial Engineering with thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 24 credits of course work, 2 credit of colloquium, and 6 credits of research leading to a thesis, as required for the M.S. degree in Industrial Engineering with thesis track. To receive the M.S degree in Industrial Engineering with non-thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 27 credits of course work, 2 credit of colloquium, and 3 credits of research leading to a scholarly paper, as required for the M.S. degree in Industrial Engineering with non-thesis track.

The course credits for the Option in Manufacturing Engineering must include the following:

All the following three courses: (9 credits)

IE 528  Metal Cutting Theory

IE 550  Manufacturing Systems

IE 563  Computer - Aided Design for Manufacturing

Master of Science (M.S.) Degree with thesis and non-thesis tracks- Quality Engineering Option

To receive the M.S degree in Industrial Engineering with thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 24 credits of course work, 2 credit of colloquium, and 6 credits of research leading to a thesis, as required for the M.S. degree in Industrial Engineering with thesis track. To receive the M.S degree in Industrial Engineering with non-thesis track and with an Option in Human Factors/Ergonomics Engineering, a student must complete at least 32 credits beyond the bachelor's degree: 27 credits of course work, 2 credit of colloquium, and 3 credits of research leading to a scholarly paper, as required for the M.S. degree in Industrial Engineering with non-thesis track.

The course credits for the Option in Quality Engineering must include the following:

All the following three courses (9 credits)

IE 555  Statistical Process Monitoring and Analysis

IE 566  Quality Control

IE 583  Response Surface Methodology and Process Optimization
Other Relevant Information

Students in this program may elect the dual-title degree program in Operations Research for the Ph.D. and M.S. degrees.

Student Aid

In addition to the fellowships, traineeships, graduate assistantships, and other forms of financial aid described in the STUDENT AID section of the Graduate Bulletin, the following award typically has been available to graduate students in this program:

HAROLD & INGE MARCUS GRADUATE FELLOWSHIPS--Consideration for these fellowships shall be given to all students exhibiting academic excellence who have been admitted to Penn State as candidates for a graduate degree in the Department of Industrial and Manufacturing Engineering, College of Engineering.

BENJAMIN W. NIEBEL MANUFACTURING FELLOWSHIP
Consideration for this fellowship shall be given to all students exhibiting academic excellence who have been admitted to Penn State as candidates for a graduate degree in the Department of Industrial and Manufacturing Engineering, College of Engineering.

Courses

Graduate courses carry numbers from 500 to 599. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

INDUSTRIAL ENGINEERING (I E) course list

Last Revised by the Department: Fall Semester 2005

Blue Sheet Item #: 33-07-112

Blue Sheet Item #: 33-07-113

Review Date: 06/14/05

UCA Revision #2: 7/30/07

Faculty linked: 6/20/14
CONSULTATION FROM OTHER DEPARTMENTS

The Great Valley Campus, Harrisburgh Campus, Behrend campus, and the following departments within the College of Engineering were sent the proposal for consultation; they were given one weeks’ time to send their comments/concerns back to us.

(i) Aerospace Engineering  
(ii) Agricultural and Biological Engineering  
(iii) Architectural Engineering  
(iv) Biomedical Engineering  
(v) Chemical Engineering  
(vi) Civil and Environmental Engineering  
(vii) Computer Science and Engineering  
(viii) Electrical Engineering  
(ix) Engineering Science and Mechanics  
(x) Mechanical and Nuclear engineering  
(xi) School of Engineering Design, Technology and Professional Programs (SEDTAPP)

The following responses were received.

From: Raj Acharya - Forward  
Sent: Friday, October 24, 2014 11:39 AM  
To: Paul Griffin  
Subject: Re: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

CSE supports your proposal.

Raj (Raj Acharya, Computer Science and Engineering)

From: Phillip Savage  
Sent: Friday, October 24, 2014 9:57 AM  
To: Paul Griffin  
Subject: Re: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

Paul

No objections from ChE.

Phil (Philip Savage, Chemical Engineering)
From: Karen Thole
Sent: Friday, October 24, 2014 11:23 AM
To: Paul Griffin
Subject: RE: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

The MNE Department supports this proposal.

Karen (Karen Thole, Mechanical and Nuclear Engineering)

From: Kultegin Aydin
Sent: Friday, October 24, 2014 1:17 PM
To: Paul Griffin
Subject: RE: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

Dear Paul,

The EE Department supports the modified version of your proposal.

Best regards,

Kultegin (Kultegin Aydin, Electrical Engineering)

From: Cheng Dong <cxdbio@engr.psu.edu>
Date: October 29, 2014 at 10:36:44 AM CDT
To: Paul Griffin <pmg14@engr.psu.edu>
Subject: Re: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

Dear Paul,

I consulted one of my BME faculty who will be in charge of our non-thesis MS program, although BME has to build a new one, not just a add-on; so it is different from the IE. Here are some inputs I received’’

Comments
1. With the introduction of the non-thesis masters, it seems appropriate not to keep the M Eng. Administratively, eliminating the M. Eng reduces extra work for the department and it clarifies things for the student.
2. The rationale for phasing out the M. Eng, however, suggests that the non-thesis Masters will be similar to the M Eng. It is important to make sure that, from an educational and training standpoint, the thesis and non-thesis versions of the MS have equal rigor and scholarly impact for the students, even if there are differences in their approach. One sentence stands out that indicates that the IE proposal may need to think more carefully about this issue:

on page 3: "The proposed MS degree with non-thesis track will also help the students working in industry to obtain their MS degree in Industrial Engineering in an easier way as compared to the current MS degree with thesis track.”
I think the author is saying that the non-thesis masters, being less open-ended in terms of time, than the thesis-based masters, may fit into a typical schedule of someone already in industry a little better. Similarly, the proposer suggests that 70% of students will take the non-thesis masters option; again suggesting that the non-thesis and thesis based masters will not have the same scholarly component. The proposer needs to spell out how the non-thesis masters will have equal scholarly content as a thesis-based masters. As it stands there is very little information on how the quality to the research paper for the non-thesis masters will be evaluated, except that

"The paper must demonstrate the capability of the student to integrate and apply concepts and techniques learned in the courses to solve an engineering problem."

Thanks,

Cheng (Cheng Dong – Bio Medical Engineering)

Our Response: Our proposal does not state that “the non-thesis Masters will be similar to the M Eng.” It states that “the credit requirements for the current MENG degree (30 credits) and the proposed MS degree with non-thesis track (32 credits) are very similar.” As per the Graduate Council, MENG degree is a professional degree whereas an MS degree is an academic degree.

Our statement that the expected percentage of students seeking the Master’s degree with non-thesis track will be 70% of the students seeking Master’s degree is only an estimate, based on the current percentage of master’s students in the department seeking M.S. degree with thesis track. All we are saying is that if currently 66% of the masters students in the department seek MS degree with thesis track (which takes about four semesters to complete), then approximately 70% of the students will seek the proposed MS degree with non-thesis track, which requires an estimated one-year to complete.

The quality of the research paper will be evaluated by the student’s research adviser just like it is being done now in the case of the quality of the thesis for the MS degree with thesis track and the quality of the paper for the MENG degree. It is important to note that the contribution made by a student in research and the resulting paper (3 credits) for the proposed MS degree with non-thesis track will be less than the contribution made by a student in research and the resulting thesis (6 credits) for the current MS degree thesis track, because of the difference in the credit requirements. It is also important to note that the paper for the proposed MS degree with non-thesis track will satisfy the culminating experience requirement of the Graduate Council.

From: George A. Lesieutre
Sent: Thursday, October 30, 2014 12:10 PM
To: Paul Griffin
Subject: Re: 10/31/2014 Action Item: Consultation for a Proposal for MS degree in Industrial Engineering with non-thesis track and dropping MEng degree

Paul --
Aerospace Engineering supports your proposal.

-GL  (George A. Lesieutre- Aerospace E
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of Engineering
Department or Instructional Area: Chemical Engineering

New Graduate Program, Option, or Minor: □ Add
□ Add a new graduate program:
□ Classification of Instructional Programs (CIP) Code:
□ Designation of new graduate option:
□ Designation of new graduate minor:

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Existing Graduate Program Option, or Minor: □ Change □ Drop
□ Current designation of graduate program: Masters of Science in Chemical Engineering
□ Current designation of graduate option:
□ Current designation of graduate minor:

□ New designation of existing graduate program (if changing):
□ New designation of existing graduate option (if changing):
□ New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): Add a non-thesis track to the MS program in Chemical Engineering

Indicate effective semester:
□ First semester following approval
□ Second semester following approval

Submitted by Graduate Program Head
Phillip Savage
□ Printed name Signature
Date: 11-7-14

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
LEE P. CORADA □ Printed name Signature
Date: 11-21-14

Approved by College/School Dean/Chancellor (or Designee):
Catherine M. Harmonosky
□ Printed name Signature
Date: 11-31-14
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On behalf of C. Andrew Cole
Printed name
Signature
Date: 4/22/15

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On behalf Joan Redwing
Printed name
Signature
Date: 4/22/15

Noted by Dean of the Graduate School:

Regina Vasilatos-Younker
Printed name
Signature
Date: 4/23/15
Proposal to add a non-thesis track to the current Master of Science degree in Chemical Engineering

Department submitting the proposal:
Chemical Engineering

Contact information:
Michael J. Janik
Graduate Program Coordinator
Email: mjanik@psu.edu
Phone: 863-9366
Phillip Savage
Department Head
Email: psavage@engr.psu.edu
Phone: 867-5876

College Affiliation:
College of Engineering
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Justification for the proposed changes</td>
<td>3</td>
</tr>
<tr>
<td>b) Admission Requirements</td>
<td>3</td>
</tr>
<tr>
<td>c) Proposed degree requirements</td>
<td>4</td>
</tr>
<tr>
<td>d) Consultations</td>
<td>6</td>
</tr>
<tr>
<td>e) Proposed changes in the graduate bulletin</td>
<td>9</td>
</tr>
</tbody>
</table>
Proposal to add a non-thesis track to the current Master of Science degree in Chemical Engineering

a) Justification for the proposed changes

We propose a new non-thesis MS track that integrates fundamental Chemical Engineering concepts with a culminating chemical engineering research project. This new program will provide a framework for life-long learning and problem solving via the application of advanced chemical engineering topics.

The current MS program in Chemical Engineering requires 30 credits, which must include at least 18 classroom course credits, 2 colloquium credits, and a research project (including research course credits) culminating in a thesis and an oral defense. The Chemical Engineering department does not currently (over the last 10+ years) admit students directly to this MS program, and the degree is pursued mainly by students admitted to the PhD program who do not complete the doctoral degree (or chose to get their MS along the way) or as part of an Integrated Undergraduate/Graduate program for Schreyer’s students. This program typically requires 2 years to complete for students entering with a BS degree in Chemical Engineering, including one or more years dedicated mainly to research activities. We propose to develop a new non-thesis MS track consisting of 30 credits, including 21 credits of coursework, 2 credits of colloquium, and 7 credits of research in the spring through summer that culminates in a research project showcase and paper. This non-thesis track will allow students to complete a MS degree typically in 12 months, beginning in the fall and including spring and summer semesters. Addition of this track will make Masters-level chemical engineering education at Penn State more broadly accessible, as students still exploring a possible career in research could gain deeper knowledge of chemical engineering fundamentals with just one year of study beyond the BS degree.

We expect this program will initiate with enrollments of 5-10 students, and future growth will depend on the market realized and potential for growing within the Chemical Engineering department coursework/faculty constraints. Students in this program will be full time, and most typically will enroll in this program directly following completion of a BS degree in Chemical Engineering. We expect this will include both domestic and international students.

b) Admission requirements

Students seeking the proposed non-thesis MS program will be admitted to begin their studies during the fall semester. The admission requirements are equivalent to other graduate degrees in Chemical Engineering (PhD and current MS program), which are:
Scores from the Graduate Record Examination (GRE) are required for admission. An applicant must receive a baccalaureate degree from a regionally accredited institution. Graduates holding degrees in engineering, mathematics, or the physical sciences with a 3.00 grade-point average or above (or equivalent for schools not using a 0-4 GPA scale) will be considered for admission.

All international applicants must submit scores for the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). The minimum acceptable score for the TOEFL exam is 550 for the paper-based exam, 213 for the computer-based test, or a total score of 80 with a 19 on the speaking section for the internet-based test. The minimum composite score for the IELTS is 6.5.

International applicants who receive a baccalaureate degree from a college, university, or institution in any of the following countries are exempt from the TOEFL requirement: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, New Zealand, Northern Ireland, Scotland, the United States, or Wales.

c) Proposed degree requirements

<table>
<thead>
<tr>
<th></th>
<th>Current MS with thesis track</th>
<th>Proposed MS non-thesis track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of course credits</td>
<td><strong>18 credits</strong></td>
<td><strong>21 credits</strong></td>
</tr>
<tr>
<td>Minimum number of course credits</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>credits in Chemical Engineering at 500 level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core courses required</td>
<td>CHE 524 (3 credits)</td>
<td>CHE 524 (3 credits)</td>
</tr>
<tr>
<td></td>
<td>CHE 535 (3 credits)</td>
<td>CHE 535 (3 credits)</td>
</tr>
<tr>
<td></td>
<td>CHE 544 (3 credits)</td>
<td>CHE 544 (3 credits)</td>
</tr>
<tr>
<td>Number of allowed CHE 4XX courses</td>
<td>Not distinctly limited. Must exclude any course required of PSU undergraduates</td>
<td>Limited to 3 credits at the 400 level, which must exclude any course required of PSU undergraduates</td>
</tr>
<tr>
<td>graduates</td>
<td></td>
<td></td>
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<tr>
<td>Graduate colloquium (CHE 590)</td>
<td><strong>2 credits</strong> (One Fall CHE 590 and one Spring CHE 590)</td>
<td><strong>2 credits</strong> (One Fall CHE 590 and one Spring CHE 590)</td>
</tr>
<tr>
<td>Department research seminar</td>
<td>Required, but credit requirement not explicit</td>
<td>Required, but credit requirement not explicit</td>
</tr>
<tr>
<td>participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research credits towards MS degree</td>
<td>CHE 600 (number of credits vary, would be 10 if students complete exactly 18 credit course minimum and 2 credits of colloquium)</td>
<td>CHE 596 (7 credits, 3 in spring semester and 4 in summer)</td>
</tr>
<tr>
<td>Culminating experience</td>
<td>Completion of research thesis and oral defense</td>
<td>Completion of a research project including written scholarly paper and presentation</td>
</tr>
<tr>
<td>TOTAL CREDITS</td>
<td><strong>30</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>
The students completing the non-thesis MS track will begin their degree pursuit in the fall semester. Students will complete coursework, including colloquium and research seminar, during the fall and spring semesters. They will begin research in the spring semester and continue into the summer, culminating in a final research project showcase and paper. The proposed plan of study is as follows:

Fall Semester (13 credits)
CHE 524, Chemical Engineering Application of Thermodynamics (3)
CHE 535, Chemical Reaction Engineering (3)
CHE 544, General Transport Phenomena (3)
CHE 5XX, Graduate Elective (3)
CHE 590, Colloquium (1)

Spring Semester (13 credits)
CHE 5XX, Graduate Elective (3)
ENGR/SCI Elective (3)
ENGR/SCI Elective (3)
CHE 590, Research Skills Development Colloquium (1)
CHE 596, Independent Study (3)

Students will be matched with research advisors and identify a final research project late in the fall semester, in order to initiate research activity during the spring semester. Spring colloquium (CHE 590) will provide seminar style tutorials on research skills (critical reading of the literature, hypothesis development, design of experiments, writing and presentation), and assignments to aid in developing these skills will integrate with the student’s initiating their research activities. Students will register for 3 credits of CHE 596, Independent Study, with their research advisor as the instructor and will begin their research projects.

Summer Semester (4 credits)
Completion of research project, registering for CHE 596 (4 credits)

Students will register for CHE 596 (independent study) during the summer, and concentrate full time on their research during the summer term. Students will pursue a research project under the supervision of their advisor, and must submit a final paper reporting the results of this research project. The paper must demonstrate the capability of the student to integrate and apply concepts and techniques learned in the core courses as well as elective courses chosen to their research area. Students will be required to participate in a project showcase at the end of the summer term, in which students will present the current status of their research projects to the department faculty and other students. Submission of the culminating research paper will follow this project showcase. Though the target is for students to submit this paper at the end of the summer, final submission should incorporate feedback received during the project showcase,
and may extend into the fall semester (regardless of whether students are resident at PSU in the fall semester).

No changes are proposed in the SARI requirements specific to the new track.

**Option requirements:**

We do not propose to include any Options within the non-thesis MS track.

**Record of consultation:**

An email (pasted below) was sent on 10/20/14 to the following individuals requesting consultation:

Gary Messing and Suzanne Mahoney – Materials Science and Engineering

Turgay Ertekin – Energy and Mineral Engineering

William Burgos and Peggy Johnson – Civil and Environmental Engineering

Daniel Haworth and Karen Thole – Mechanical and Nuclear Engineering

Kathryn Jablokow, Associate Professor of Mechanical Engineering and Engineering Design at Great Valley Campus and Coordinator, General Engineering-Multidisciplinary Engineering Design (GE-MDE)

Peter Idowu, Assistant Dean of Graduate Studies at Harrisburg Campus

Responses, pasted below, were received from Suzanne Mahoney, Dan Haworth, William Burgos, Kathryn Jablokow, and Luis Ayala (on behalf of the Energy and Mineral Engineering Department). No reply was received from Peter Idowu, with the email below noting a lack of reply would be considered as indicating “no concern.” All replies noted no that there were no concerns with the proposal, and no revisions were made based on external consultation.

**Email sent requesting consultation:**

Our Chemical Engineering department is proposing a change to our MS program to add a non-thesis track, and we would appreciate your consultation on the proposed change. I have attached the program change proposal. In short, we propose to complement our current MS with thesis track (18 course credits + a research thesis and oral defense) with a non-thesis track (24 course credits + a research or process/product development project with report and presentation).

We have been asked to request consultation both within and beyond the College of Engineering before submission of the proposal to the appropriate COE committee. I would appreciate receiving any feedback on the proposal on or prior to November 3rd. A lack of reply will be reported as a “no concerns raised.”

Thank you for your time and consideration,
Responses:

Luis Ayala:

Dear Michael:

Your message below was sent to my office for consultation with the relevant graduate faculty in EME. This email is to confirm that, after consultation with our faculty, the Energy and Mineral Engineering (EME) Department has no objections to your Department’s proposal to change your MS program and add a non-thesis track.

Please let us know if you have any additional questions.

Luis

Kathryn Jablokow:

Dear Mike,

I have reviewed this program and have no concerns. I think it is a good response to the changing needs of our students and has the potential to broaden participation in chemical engineering degrees at Penn State.

Best regards,

Kathryn

Kathryn W. Jablokow, Ph.D., FASME
Associate Professor of Mechanical Engineering and Engineering Design
Coordinator, General Engineering-Multidisciplinary Engineering Design (GE-MDE)
The Pennsylvania State University
Great Valley School of Graduate Professional Studies
30 E. Swedesford Road, Malverne, PA 19355
Phone: 610-648-3372
William Burgos:

Mike

The proposal looks good. I have no concerns.

Regards

Bill

Suzanne Mahoney:

Dear Michael,

I do not have any concerns.

Suzanne

Suzanne Mohney
Professor of Materials Science and Engineering
Chair of the Intercollege Graduate Degree Program
in Materials Science and Engineering
Penn State University
N-209 Millennium Science Complex
University Park, PA 16802
E-mail: mohney@psu.edu
Office: (814) 863-0744
http://www.esm.psu.edu/mohney/

Dan Haworth:

Mike –

MNE has no concerns, and supports your proposal.

Regards,

Dan
PROPOSED CHANGES TO THE GRADUATE BULLETIN

Chemical Engineering (CH E)

PHILLIP SAVAGE, Head of Chemical Engineering
160 Fenske Laboratory
814-867-5876

Degrees Conferred:
Ph.D., M.S.

Graduate Faculty

Course offerings and research facilities are available in: bioprocessing, protein engineering, energy and alternative energy, catalysis and kinetics, fluid mechanics, nanotechnology, polymer science and engineering, process control, molecular simulation, systems biology and optimization.

Admission Requirements

Scores from the Graduate Record Examination (GRE) are required for admission. At the discretion of a graduate program, a student may be admitted provisionally for graduate study in a program without these scores. Requirements listed here are in addition to general Graduate School requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.

Students should be a graduate of an accredited program in chemical engineering. Graduates with other accredited engineering, mathematics, or physical science majors may be admitted, though alternative program schedules may be required as students will be required to demonstrate graduate level competency in the core chemical engineering disciplines of thermodynamics, reaction and reactor kinetics, and transport. This may include making up of undergraduate deficiencies without graduate credit. Students with a 3.00 grade-point average or above (on a 4.00 scale) and with appropriate course backgrounds will be considered for admission.

Master's Degree Requirements

Two tracks are available in the Chemical Engineering MS program, a thesis and a non-thesis track. A minimum of 18 course credits (30 credits total) is required of the thesis track, which must also include completion of a research thesis and oral defense of the thesis. A minimum of 214 course credits (30 credits total) is required of the non-thesis track. This track, which also includes a 74 credit research or process/product development project during the spring and summer that includes a culminating written paper and presentation. All MS students complete a set of core-courses in the fundamental chemical engineering disciplines of thermodynamics, reaction and reactor kinetics, and transport. There is no communication or language requirement. Continuous registration is required for all graduate students until the thesis or final paper is approved.

Doctoral Degree Requirements

A minimum of 30 graduate course credits is required and must include a minimum of 15 credits of 500-series Chemical Engineering courses taken at the University. There is no communication or language requirement. The comprehensive examination consists of a written research proposal or project defended orally after it has been accepted.

Continuous registration is required for all graduate students until the thesis is approved.

Other Relevant Information
Programs leading to a minor in Chemical Engineering are available to both M.S. and Ph.D. candidates who wish to complement studies in their major fields with a broader knowledge of chemical thermodynamics, transport phenomena, and reactor design.

**Student Aid**

Graduate assistantships available to students in this program and other forms of student aid are described in the [STUDENT AID](#) section of the *Graduate Bulletin*.

**Courses**

Graduate courses carry numbers from 500 to 599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: Engineering
Department or Instructional Area: Civil and Environmental Engineering

New Graduate Program, Option, or Minor: [ ] Add

Designation of new graduate program:
Classification of Instructional Programs (CIP) Code:
Designation of new graduate option:
Designation of new graduate minor:

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Existing Graduate Program Option, or Minor: [ ] Change [ ] Drop

Current designation of graduate program: Civil Engineering
Current designation of graduate option:
Current designation of graduate minor:

New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above): change in the requirements for the M.Eng. degree

Indicate effective semester:
[ ] First semester following approval
[ ] Second semester following approval

Submitted by Graduate Program Head
Peggy A. Johnson
Printed name
Signature
Date: 12/19/14

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:

Printed name
Signature
Date: 12/19/14

Approved by College/School Dean/Chancellor (or Designee):

Printed name
Signature
Date: 12/19/14
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On behalf of C. Andrew Cole  
Printed name
Signature
Date: 1/22/15

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On behalf of Joan Redwing  
Printed name
Signature
Date: 1/22/15

Noted by Dean of the Graduate School:

Regina Vasilatos-Younker  
Printed name
Signature
Date: 1/23/15
PROPOSAL TO CHANGE THE CULMINATING EXPERIENCE
FOR THE EXISTING
MASTER OF ENGINEERING DEGREE (M.Eng.)
IN CIVIL ENGINEERING

DEPARTMENT SUBMITTING THE PROPOSAL:
DEPARTMENT OF CIVIL AND ENVIRONMENTAL
ENGINEERING

CONTACT INFORMATION: WILLIAM BURGOS, GRADUATE
OFFICER

Email: wdb3@psu.edu

Telephone: 814-863-0578

COLLEGE AFFILIATION:
COLLEGE OF ENGINEERING
TABLE OF CONTENTS

Page numbers

a. Justification for the proposed changes 3

b. Proposed changes in program 3
   i. Revision of program with old and new requirements 4
   ii. Admission requirements 5
   iii. Graduate Bulletin with marked changes 6

c. Consultations 12

d. Consultation with Office for Research Protections (SARI) 18
PROPOSAL TO CHANGE THE CULMINATING EXPERIENCE FOR THE MASTER OF ENGINEERING DEGREE IN CIVIL ENGINEERING

a. Justification for the proposed changes

The purpose of this proposal is to replace the writing portfolio with a capstone course as the culminating experience for the Master of Engineering (M.Eng.) degree in Civil Engineering. The motivation for this proposal is to streamline degree requirements such that students can complete this degree in two semesters (Fall and Spring). Currently, most students seeking the M.Eng. degree complete their degree within three semesters (Fall, Spring and Fall semesters). By changing the culminating experience to a common, required capstone course, students will be able to complete an advanced degree in a shorter amount of time. There is a strong demand for this degree. Since 2012, the Department of Civil and Environmental Engineering (CEE) has received an average of 600 applicants per year. Of these 600 applicants, on average, 200 were admitted and 40 arrived to begin their in-residence degree programs. With the opportunity to complete the M.Eng. degree in two semesters, CEE expects the enrollment of M.Eng. students alone to approach 30 to 40 per year (i.e., this could double the Department’s graduate enrollment). In the near future, it is expected that demand for this degree will increase, as a graduate degree in Civil Engineering will be required in many states prior to taking the Professional Engineer (P.E.) exam.

The CEE Department proposes to replace the writing portfolio with a required capstone course, the new CE 535 Integrated Project Management for Civil Engineers. The culminating experience of this course will utilize a project-based, team-based learning process to teach project management’s value, methodology, and application to civil and environmental engineering projects. Students will learn how to initiate, plan, organize, staff, direct, control, and closeout a project. Key topics will include: role of the project manager, civil engineering project procurement/proposal development, importance and skills of communications, project team development and leadership, team conflict resolution, design management, scope management, work breakdown structure, scheduling/time management, budgeting/cost management, risk management, resource management, earned value, project evaluation and control, and project closeout and termination. This will be a writing-intensive course where students will complete both individually-authored and team-authored reports. Teams will be assembled to facilitate cross-specialization (Infrastructure, Transportation Systems, and Water and Environment) learning.

b. Proposed changes in program

i. Revision of program with old and new requirements

The current M.Eng. degree requires that each student complete a writing portfolio. The writing portfolio must be approved by the student’s academic advisor and the Department Head, and then submitted to the Graduate Academic Programs Office. The current M.Eng. degree requires a total of 30 credits of coursework and a one credit colloquium that is not counted toward any credit requirement. The one
credit colloquium (CE 590) is used to satisfy a portion of the University’s Scholarship and Research Integrity (SARI) training requirements. Completion of the writing portfolio does not count towards any credit requirement.

The new M.Eng. degree will require a total of 31 credits consisting of 30 credits of course work and a one-credit colloquium (CE 590) that will still be required as part of SARI training. A minimum of 31 graduate credits (400-level and above) will be required, of which 20 must be earned at an established graduate campus of the University. At least 18 credits at the 500 level will be required. M.Eng. students will not take any 600 level credits. A minimum of 12 credits of course work (400 and 500 level) will be required in the major (courses prefixed C E). Students will be required to select an area of specialization from the three choices of Infrastructure, Transportation Systems, or Water and Environment. Students will be required to complete core courses prescribed by their area of specialization.

**Table 1.** Comparison of new and old program requirements.

<table>
<thead>
<tr>
<th></th>
<th>Proposed M.Eng. Degree</th>
<th>Current M.Eng. Degree</th>
<th>Current M.S. Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Number of Total Credits</td>
<td>31</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Minimum Number of Course Credits (400 and 500 level)</td>
<td>30</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>Minimum Number of 500 level Course Credits</td>
<td>18</td>
<td>18</td>
<td>18*</td>
</tr>
<tr>
<td><em>(includes 600 level)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Number of C E prefix Course Credits</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Minimum Number of 600 level Research Credits</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

The M.Eng. degree is designed as a one-year Master’s degree program and students are required to start their degree in the Fall semester. The preferred plan of study is as follows:

- Fall semester: Fifteen credits of course work plus one credit of CE 590
- Spring semester: Fifteen credits of course work, including CE 535

Students entering the M.Eng. degree must select and declare an area of specialization. The three areas of specialization are Infrastructure, Transportation Systems, and Water and Environment, where each area has specific core course requirements.
Table 2. Core course requirements for the different areas of specialization.

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Infrastructure</th>
<th>Transportation Systems</th>
<th>Water and Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete 4 of 5:</td>
<td>CE 512 Advanced Soil Mechanics</td>
<td>Complete 3 of 3:</td>
<td>CE 561 Surface Hydrology</td>
</tr>
<tr>
<td>CE 544 Design of Reinforced Concrete Structures</td>
<td>CE 548 Structural Design for Dynamic Loads</td>
<td>CE 523 Analysis of Transportation Demand</td>
<td>CE 570 Environmental Aquatic Chemistry</td>
</tr>
<tr>
<td>CE 584 Concrete Materials and Properties</td>
<td>CE 585 Infrastructure Asset Management</td>
<td>CE 525 Transportation Operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CE 528 Transportation Safety Analysis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.Eng. Required Courses</td>
<td>CE 535 Integrated Project Management for Civil Engineers</td>
<td>CE 535 Integrated Project Management for Civil Engineers</td>
<td>CE 535 Integrated Project Management for Civil Engineers</td>
</tr>
<tr>
<td>CE 590 Colloquium</td>
<td>CE 590 Colloquium</td>
<td>CE 590 Colloquium</td>
<td></td>
</tr>
<tr>
<td>Elective Courses</td>
<td>several from C E, E MCH, and STAT</td>
<td>several from C E, I E, and STAT</td>
<td>several from C E, GEOSC, MATH, and METEO</td>
</tr>
</tbody>
</table>

**ii. Admission requirements**

Students seeking the current M.S. or Ph.D. degree will be admitted in the Fall or Spring semesters. Students seeking the modified M.Eng. degree will only be admitted in the Fall semester. The preferred plan of study for M.Eng. students will be to take the culminating capstone course (CE 535) in their second and final semester, and this course will only be offered in the Spring semester.

The admission requirements for the modified M.Eng. degree will be the same as those for the current M.S. degree. Candidates should possess a baccalaureate degree from a regionally accredited institution. Students in engineering, physical sciences, or mathematics with a 3.00 grade-point average (on a 4.00 scale) may be considered for admission. Students without a baccalaureate degree in engineering would be admitted on a provisional basis pending successful completion of entrance course requirements (completed concurrently with degree requirements). Students without a baccalaureate degree in engineering would not be able to complete the M.Eng. degree in two semesters.

All applicants will be required to submit scores from the General Graduate Record Examinations (GRE) Aptitude Test (verbal, quantitative, and analytical). For the M.Eng. degree, the GRE requirement will be waived for students who have graduated with a degree from the College of Engineering at The Pennsylvania State University with a cumulative grade-point average of greater than 3.30. This waiver will be granted as an incentive to recruit Penn State undergraduate students and alumni. This cutoff
value was selected based on the statistical distribution of GPA values for B.S. C E graduates for the past five years and represents the median value. This cutoff value could be raised, e.g. to correspond to the top quartile, if enrollment exceeds expectations.

International applicants whose native language is not English will be required to submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System). The minimum acceptable score for the TOEFL is a total score of 80 with a 19 on the speaking section for the Internet-based test (IBT). The minimum composite score for the IELTS is 6.5 on all subjects. International applicants who have received a baccalaureate or Master’s degree from a college, university, or institution in any of the following countries are exempt from the TOEFL/IELTS requirement: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, or Wales.

iii. Graduate Bulletin with marked changes

http://bulletins.psu.edu/graduate/programs/C/GRAD%20C%20E accessed 09/17/14

Civil Engineering (C E)

Program Home Page (Opens New Window)

PEGGY A. JOHNSON, Head of the Department of Civil and Environmental Engineering
212 Sackett Building
814-863-3084 814-863-3084

Degrees Conferred:

Ph.D., M.S., M.Eng.

The Graduate Faculty

Students may specialize in environmental engineering, geotechnical and materials engineering, structural engineering, transportation engineering, and water resources engineering, construction engineering, environmental engineering, hydrosystems engineering, structural engineering, and transportation engineering.

Admission Requirements

The requirements listed here are in addition to the general requirements stated in the GENERAL INFORMATION section of the Graduate Bulletin.
Candidates should possess a baccalaureate degree from a regionally accredited institution. Students in engineering, physical sciences, or mathematics with a 3.00 grade-point average (on a 4.00 scale) may be considered for admission. Exceptions to the minimum 3.00 grade-point average may be made for students with special backgrounds, abilities, and interests. Students without a baccalaureate degree in engineering would be admitted on a provisional basis pending successful completion of entrance requirements (completed concurrently with degree requirements). Students with a 3.00 junior/senior grade-point average (on a 4.00 scale) and appropriate course backgrounds may be considered for admission. Exceptions to the minimum 3.00 grade-point average may be made for students with special backgrounds, abilities, and interests.

U.S. applicants will upload unofficial copies of their transcripts, a statement of objectives, and three references for letters of recommendation when applying to the program. If admitted, applicants will be required to provide the Graduate School with OFFICIAL COPIES of transcripts of all their previous course work (in duplicate). In addition, all applicants must submit scores from the General Graduate Record Examinations Aptitude Test (verbal, quantitative, and analytical). For the M.Eng. degree, the GRE requirement will be waived for students who have graduated with a degree from the College of Engineering at The Pennsylvania State University with a cumulative grade-point average of greater than 3.30.

International applicants will upload unofficial copies of their transcripts, a statement of objectives, and three references for letters of recommendation when applying to the program. If admitted, applicants will be required to provide the Graduate School with OFFICIAL TRANSCRIPTS or ATTESTED COPIES of transcripts, degree, and diploma certificates in both English and native language. Photocopies will NOT be accepted. All international applicants whose native language is not English must submit scores for the TOEFL (Test of English as a Foreign Language) or the IELTS (International English Language Testing System). The minimum acceptable score for the TOEFL is a total score of 80 with a 19 on the speaking section for the Internet-based test (iBT). The minimum composite score for the IELTS is 6.5 on all subjects. International applicants who have received a baccalaureate or master’s degree from a college, university, or institution in any of the following countries are exempt from the TOEFL requirement: Australia, Belize, British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Republic of Ireland, Liberia, New Zealand, Northern Ireland, Scotland, the United States, or Wales.

All applicants must provide the department with official transcripts of all their previous course work (in duplicate), a statement of objectives, and three letters of recommendation AT THE TIME OF APPLICATION. In addition, all applicants must submit scores from the General Graduate Record Examinations Aptitude Test (verbal, quantitative, and analytical).

All international applicants whose native language is not English must present an acceptable score (560 minimum on the paper-based test; 220 minimum on the computer-based test) on the Test of English as a Foreign Language (TOEFL).
Application Deadlines

M.Eng.: Complete applications including required supplementary materials (e.g., official transcripts, reference letters) should be submitted by March 15th of the calendar year for admission in Fall semester. International students are strongly encouraged to submit complete applications early to allow sufficient time for visa processing.

M.S. and Ph.D.: Complete applications including required supplementary materials (e.g., official transcripts, reference letters) should be submitted by September 15th for admission in Spring semester and by December 15th for admission in Fall semester. International students are strongly encouraged to submit complete applications early to allow sufficient time for visa processing.

Applicants for fall admission who wish to be considered for financial aid should have COMPLETED applications on file by DECEMBER 1 of the preceding year.

Degree Requirements

Three degrees are offered: Master of Engineering (M.Eng.), Master of Science (M.S.), and the Doctor of Philosophy (Ph.D.).

The M.Eng. degree is a non-thesis professional master's degree. The program provides training for advanced professional practice. A minimum of 31 graduate credits (400 level and above) of course work are required. At least 18 credits must be earned in graduate courses (500 level). At least 12 credits must be earned in courses with the CE prefix. At least 20 credits must be earned at an established graduate campus of the University. All students are required to take CE 535 Integrated Project Management for Civil Engineering to fulfill the requirement for a culminating experience. All students are required to take the 1-credit CE 590 Colloquium and complete all requirements for Scholarship and Research Integrity (SARI) training. The M.Eng. degree is designed as a one-year master’s degree program and students are required to start their degree in the Fall semester. The preferred plan of study is as follows:

- Fall semester: Fifteen credits of course work plus one credit of CE 590
- Spring semester: Fifteen credits of course work, including CE 535

Students entering the M.Eng. degree must select and declare an area of specialization, where each area has specific core course requirements. The three areas of specialization are Infrastructure, Transportation Systems, and Water and Environment.

The M.S. degree program is strongly oriented toward research. A thesis is required, and at least 6 credits of thesis research (C E 600 or 610) must be included in the candidate's academic course plan. A minimum of 31 graduate credits (400-level and above) are required, of which 20 must be earned at an established graduate campus of the University. A minimum of 24 credits of course work are required. A minimum of 12 credits of course work (400 and 500 level) must be completed in the major (courses prefixed C E). At least 18 credits in the 500 and 600 levels, combined, must be included in the program. Specific core courses are required depending on the
specialization within the department. Students are not permitted to count audited credits toward the minimum credits required for the degree. All students are required to take the 1-credit CE 590 Colloquium and complete all requirements for Scholarship and Research Integrity (SARI) training. A candidate for the Ph.D. degree must pass the English proficiency and candidacy examinations, prepare and defend the thesis proposal as part of the oral comprehensive examination, and pass the final oral examination (thesis defense). Prior to completion of the Ph.D. program, the candidate must spend at least two consecutive semesters as a registered full-time student.

Continuous registration is required for all graduate students until the thesis (M.S.) or dissertation (Ph.D.) has been approved or course requirements have been satisfied (M.Eng.). See also Environmental Engineering.

The M.Eng. degree is a nonthesis professional master's degree. The program provides training for advanced professional practice. A minimum of 30 graduate credits (400 level and above) of course work and a writing portfolio are required. It should be noted that 20 credits must be earned at an established graduate campus of the University. At least 15 credits must be earned in graduate courses (500 level). Divisions may require specific core courses. Students are not permitted to count audited credits toward the minimum credits required for the degree.

The M.S. degree program is strongly oriented toward research. A minimum of 30 graduate credits (400-level and above) is required, of which 20 must be earned at an established graduate campus of the University. At least 18 credits in the 500 and 600 levels, combined, must be included in the program. A minimum of 12 credits of course work (400 and 500 level), as contrasted with research, must be completed in the major (courses prefixed C E). Division may require specific core courses. Students are not permitted to count audited credits toward the minimum credits required for the degree. A thesis is required, and at least 6 credits of thesis research (C E 600 or 610) must be included in the candidate's academic course plan.

A candidate for the Ph.D. degree must pass the English proficiency and candidacy examinations, prepare and defend the thesis proposal as part of the oral comprehensive examination, and pass the final oral examination (thesis defense). In addition, a Ph.D. candidate must satisfy the University residency requirement by registering for two consecutive semesters as a full-time student.

Continuous registration is required for all graduate students until the thesis or writing portfolio has been approved. See also Environmental Engineering.

**Biogeochemistry Dual-Title Degree Program**

Graduate students with research and educational interests in biogeochemistry may apply to the Biogeochemistry Dual-Title Degree Program. Students in the Biogeochemistry Dual Title program are required to have two advisers from separate disciplines: one individual serving as a primary adviser in their major degree program and a secondary adviser in an area within a field covered by the dual-title program and a member of the Biogeochemistry faculty. Additional coursework from an approved list of courses is required. All students must pass a candidacy
A single candidacy examination that includes biogeochemistry will be administered for admission into the student's Ph.D. program, as well as the biogeochemistry dual-title. The structure and timing of this exam will be determined jointly by the dual-title and major program. The student's doctoral committee should include faculty from the major program of study and also faculty with expertise in biogeochemistry. The field of biogeochemistry should be integrated into the comprehensive examination. A Ph.D. dissertation that contributes fundamentally to the field of biogeochemistry is required.

**Other Relevant Information**

Students in this program may elect to participate in the dual-title degree program option in Operations Research for the Ph.D. and M.S. degrees. See also [Environmental Engineering](#).

**Student Aid**

Graduate assistants and other forms of student aid are described in the [STUDENT AID](#) section of the *Graduate Bulletin*. International applicants who wish to be considered for a teaching assistantship must present an acceptable score (250-300 or 55-60) on the Test of Spoken English (TSE). The TSE can be taken in many countries, or at Penn State after arrival. The Department offers a number of graduate fellowships.

**CECIL M. PEPPERMANN MEMORIAL GRADUATE FELLOWSHIP**

Available to a graduate student in civil or environmental engineering specializing in one of the following fields, listed in order of priority: waste treatment and management, water pollution control, environmental engineering, or related fields.

**Courses**

Graduate courses carry numbers from 500 to 599 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

[**CIVIL ENGINEERING (C E) course list**](#)
Blue Sheet Item #: 36-06-185AA

Review Date: 4/14/08 10/15/14

Faculty linked: 6/5/14
c. Consultations

Dr. Peggy Johnson, Professor and Department Head of Civil and Environmental Engineering, sent out the following e-mail requests for internal and external consultations on this proposal to change the culminating experience for the M.Eng. degree in Civil Engineering, to review the course proposal for the new capstone course culminating experience (CE 535 Integrated Project Management for Civil Engineers), and to review the proposal to drop the M.Eng. degree in Environmental Engineering. Simultaneous consultations on all of these items were requested because they are all inter-related. Consultants were given one week to reply, otherwise, no reply is reported as “no concerns raised.”

From: "Peggy Johnson" <PAJ6@engr.psu.edu>
To: Karen Thole; Paul Griffin; Kultegin Aydin; George A. Lesieutre; Sven Bilen; Judith Todd; Phillip Savage; Chimay J. Anumba; Cheng Dong; Raj Acharya
Sent: Thursday, November 13, 2014 12:32 PM

To: ssa10@psu.edu, sec16@psu.edu, "PAUL HEINEMANN" <hzh@psu.edu>, "Turgay Ertekin" <eur@psu.edu>, ayala@psu.edu
Sent: Tuesday, October 21, 2014 9:42:27 AM
Subject: MEng change proposal

Our Civil and Environmental Engineering department is proposing to change the culminating experience of our MEng program and we would appreciate your consultation on the proposed change. I have attached the program change proposal, along with the course proposal for CE 535, which will serve as the culminating experience.

We are also proposing to drop the Meng degree in Environmental Engineering, and that proposal is also included.

We have been asked to request consultation both within and beyond the College of Engineering before submission of the proposal to the appropriate COE committee. I would appreciate receiving any feedback on the proposal on or prior to October 30. A lack of reply will be reported as a “no concerns raised.”

Thank you for your time and consideration,

Peggy Johnson
Head and Professor
Civil and Environmental Engineering
212 Sackett Building
Penn State University
University Park, PA
814-863-3084
paj6@psu.edu
http://www.engr.psu.edu/ce/
http://www.personal.psu.edu/faculty/p/a/paj6/
Requests for internal consultations were sent to:

<table>
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<th>External Consultant</th>
<th>Comments</th>
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<tr>
<td>Karen Thole</td>
<td>No concerns raised</td>
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<tr>
<td>Professor of Mechanical Engineering</td>
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<td>Department of Mechanical and Nuclear Engineering</td>
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<td>Paul Griffin</td>
<td>No concerns raised</td>
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<td>Professor of Industrial and Manufacturing Engineering</td>
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<td>Kultegin Aydin</td>
<td>No concerns raised</td>
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<td>Professor of Electrical Engineering</td>
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<td>George A. Lesieutre</td>
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<td>Sven Bilen</td>
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<td>Professor of Petroleum and Natural Gas Engineering</td>
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<td>Judith Todd</td>
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<td>Professor of Engineering Science and Mechanics</td>
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<td>Phillip Savage</td>
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<td>Chimay J. Anumba</td>
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<td>Professor of Architectural Engineering</td>
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<td>Cheng Dong</td>
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<td>Professor of Biomedical Engineering</td>
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<td>Raj Acharya</td>
<td>No concerns raised</td>
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<tr>
<td>Professor of Computer Science and Biological Engineering</td>
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| Sedig Agili                                                                         | No concerns raised                            |
| Professor of Electrical Engineering                                                |                                               |
| Department of Science, Engineering & Technology                                     |                                               |
| Penn State – Harrisburg                                                            |                                               |

| Luis Ayala                                                                          | No concerns raised                            |
| Associate Professor of Petroleum and Natural Gas Engineering                         |                                               |
| Associate Department Head for Graduate Education                                   |                                               |
| Department of Energy and Mineral Engineering                                        |                                               |
| Penn State – University Park                                                       |                                               |

| Shirley Clark                                                                       | Included below with our responses            |
| Associate Professor of Environmental Engineering                                     |                                               |
| Program Coordinator, Master in Environmental Pollution Control                      |                                               |
| Program Coordinator, Master of Science in Environmental Pollution Control           |                                               |
| Program Coordinator, Juris Doctor and Environmental Pollution Control               |                                               |
| Program Coordinator, Master of Engineering in Environmental Engineering             |                                               |
| Department of Science, Engineering, and Technology                                  |                                               |
| Penn State – Harrisburg                                                            |                                               |

| Jill Desiderio                                                                      | No concerns raised                            |
| Administration Staff Support                                                        |                                               |
| Systems Engineering                                                                 |                                               |
| Penn State – Great Valley                                                          |                                               |

| Laurene Wisler                                                                      | No concerns raised                            |
| Administration Staff Support                                                        |                                               |
| Engineering Management                                                              |                                               |
| Penn State – Great Valley                                                          |                                               |

| Turgay Ertekin                                                                      | No concerns raised                            |
| Professor of Petroleum and Natural Gas Engineering                                  |                                               |
| Department Head                                                                     |                                               |
| Department of Energy and Mineral Engineering                                        |                                               |
| Penn State – University Park                                                       |                                               |

| Paul Heinemann                                                                     | No concerns raised                            |
| Professor of Agricultural and Biological Engineering                                |                                               |
| Department Head                                                                     |                                               |
| Department of Agricultural and Biological Engineering                               |                                               |
| Penn State – University Park                                                       |                                               |
Comments from Dr. Luis Ayala:

From: Luis F. Ayala H. <ayala@psu.edu>
Sent: Wednesday, October 29, 2014 4:27 PM
To: Peggy Johnson
Cc: Turgay Ertekin
Subject: Re: MEng change proposal

Dear Peggy:

This is to confirm that, after consultation with our faculty, the Energy and Mineral Engineering Department has no objections to your Department’s proposal to change the culminating experience for your MEng program.

Please let us know if you have any additional questions.

Luis

Dr. Luis F. Ayala H.
Associate Professor of Petroleum and Natural Gas Engineering
& Associate Dept. Head for Graduate Education
John and Willie Leone Family Department of Energy and Mineral Engineering
The Pennsylvania State University

Address: 103A Hosler Building, University Park, PA 16802
Tel: 814-8654053; Fax: 814-8653248
Email: ayala@psu.edu

Comments from Dr. Shirley Clark:

From: Shirley Clark [mailto:sec16@psu.edu]
Sent: Wednesday, October 29, 2014 4:38 PM
To: Peggy Johnson
Subject: Re: MEng change proposal: CE 535 Integrated Project Management

Hi, Peggy:

I have reviewed the course proposal for CE 535 and I support this course addition as the culminating course for an M. Eng. degree, which is a professional degree and not a research degree.

I do have 2 comments regarding the wording in a couple of places on your course proposal.

On page 2 in the Long Course Description, the course proposal states "This course will be required by all MEng students in Civil Engineering in the second semester of their degree program....". I would consider changing it to their last semester, rather than specifying the 2nd semester. I realize that most of your students, even your M. Eng. students are full-time and start the M. Eng. degree in the fall semester with the intention of taking 15 credits per semester and graduating in the spring. However, my thoughts are that changing that to their last semester would address students who cannot finish in the 2-semester sequence or who could be admitted off-sequence, if your program allows it.

On Page 3 under Relationship of Course to Major, Option, or General Education, the last sentence states
that "This course will be required by all students in the Civil and Environmental Engineering MEng program." I am in the process of reviewing the revisions to the M.Eng. in Civil Engineering and I do not see a proposed name change of the degree to Civil and Environmental Engineering. I would suggest dropping the phrase "and Environmental" from that sentence and use the official degree name.

I am typing up the comments that we have on the other two changes and should have those to you later today.

Sincerely,
Shirley E. Clark, Ph.D., P.E., D. WRE
Associate Professor of Environmental Engineering Graduate Program Coordinator, Environmental Engineering and Environmental Pollution Control Penn State Harrisburg
777 W. Harrisburg Pike TL-105
Middletown, PA 17057
(717) 948-6127 FAX (717) 948-6580 Email: seclark@psu.edu
www.personal.psu.edu/sec16/
that is actually not an option for three reasons. First, it will only be taught once per year. Second, all students must enter the MEng degree in the Fall semester. Third, and more importantly, this IS a 9-12 month program. Students will pay a flat fee for the whole program (Graduate School requirement for the new 9-12 month MEng programs) when they enroll and will have to complete it in that time. If they are missing prerequisites, those will have to be taken prior to starting the MEng in the Fall.

Your second point is a good one – thank you for catching that. We will change our wording.

Peggy

From: Shirley Clark [mailto:sec16@psu.edu]
Sent: Thursday, October 30, 2014 1:33 PM
To: Peggy Johnson
Cc: William D. Burgos - Forward
Subject: Re: MEng change proposal

Peggy and Bill:
Sorry to send back one last comment not with the others but this came from a faculty who has served on the curricula committee. He noted that the course will probably need a prerequisite, especially at the 500-level. Based on his experience, the Faculty Senate is requiring prerequisites for upper-level courses, even if it is something as simple as admission to the program or an undergraduate class in economics.

Shirley

Changes made based on Dr. Shirley Clark’s comments:

i. Table 1 was edited slightly to differentiate the number of 400 and 500-level courses required for the M.Eng. degree.

ii. Admission requirements in the new text proposed for the Graduate Bulletin have been expanded to clarify that international applicants must submit “OFFICIAL TRANSCRIPTS or ATTESTED COPIES of transcripts” to align with current requirements of the Graduate School. U.S. applicants must submit “OFFICIAL COPIES of transcripts.”

iii. Originally, in the “ii. admission requirements” section, the third sentence of the first paragraph read – “The preferred plan of study for M.Eng. students will be to take the culminating capstone course (CE 535) in their second and final semester, and this course will only be offered in the/every Spring semester.” the/every has been changed to “the”.

iv. A prerequisite has now been added to CE 535. All students must have completed at least 15 credits of graduate coursework in Civil Engineering to be able to register for this course.
d. Consultation with Office for Research Protections

No consultation with the Office for Research Protections will be necessary because no changes have been proposed for the SARI training requirements.
Graduate Council
Program, Option, or Minor Proposal Form

Submit 1 original, signed Graduate Council proposal form and 2 hardcopies of the graduate program proposal document, with a copy of the signed proposal form attached to each proposal copy, to the Curriculum Coordinator, University Faculty Senate, 101 Kern Graduate Building, University Park. The proposals will be transmitted to the Office of the Dean of the Graduate School for entry into the Graduate Council curricular review process; for more information about the process, see the Overview of the Graduate Council Curricular Review Process.

The Program Proposal Procedures provide guidance for the development of a graduate program proposal. If you have questions regarding the preparation of a graduate program proposal or how to complete this Graduate Council proposal form, contact the Office of the Dean of the Graduate School.

College/School: College of the Liberal Arts
Department or Instructional Area: Religious Studies Program

New Graduate Program, Option, or Minor: □ Add
Designation of new graduate program:
Classification of Instructional Programs (CIP) Code:
Designation of new graduate option:
Designation of new graduate minor:

Indicate effective semester:
☐ First semester following approval
☐ Second semester following approval

Existing Graduate Program Option, or Minor: □ Change ✔ Drop
Current designation of graduate program:
Current designation of graduate option:
Current designation of graduate minor: Minor in Religious Studies
New designation of existing graduate program (if changing):
New designation of existing graduate option (if changing):
New designation of existing graduate minor (if changing):

Brief description of the change (if not noted above):

Indicate effective semester:
☐ First semester following approval
☐ Second semester following approval

Submitted by Graduate Program Head
Michael Kulikowski
Printed name
Signature
Date: 1/21/15

Noted by College/School Representative to Graduate Council Subcommittee on New and Revised Programs and Courses:
Jennifer A. Wagner-Lawlor
Printed name
Signature
Date: 1/23/15

Approved by College/School Dean/Chancellor (or Designee):
Eric Silver
Printed name
Signature
Date: 1/27/15
Recommended by Chair, Graduate Council Subcommittee on New and Revised Programs and Courses:

On behalf of C. Andrew Cole  
Printed name: [redacted]  
Signature: [redacted]  
Date: 02/03/15

Recommended by Chair, Graduate Council Committee on Programs and Courses:

On behalf of Joan Redwing  
Printed name: [redacted]  
Signature: [redacted]  
Date: 02/03/15

Noted by Dean of the Graduate School:

Regina Vasilatos-Youker  
Printed name: [redacted]  
Signature: [redacted]  
Date: 02/03/15
Reason for Request to Drop Graduate Minor in Religious Studies

Religious Studies ceased to be a budgeted unit in 2012. Faculty who formerly had appointments in Religious Studies now retain the legacy affiliation in their titles as a courtesy. A small number of undergraduate courses are taught on a voluntary basis by faculty, most of them cross-listed with other units. No graduate courses are offered in Religious Studies and there is no faculty capacity to offer them. The graduate minor should therefore be dropped.