

5. Description of proposed new certificate program

Although the certificate will draw people who have some background and interest in the environment, its specific purpose is to attract those who lack any legal background and familiarize them with the basic positive/codified law that regulates extraction from, use of, and disposal into the natural environment. One's course of study will be based upon two sets of core courses, the first covering the positive law of environmental pollution, natural resources, comparative law and international environmental law. These core courses will be taught from Legal Casebooks and include instruction in the skills of legal analysis and argument. The second core group are courses in the policy background of the positive law and how its methods can be utilized to analyze, evaluate and argue for change in existing law. The purpose of the two core course groups is to make sure students are exposed to both the "is" and "ought" of environmental law. Overall, in consultation with an assigned advisor the student will be able to create a program that includes a foundation of legal theory and practice, with a specialization (e.g. risk, science policy or environmental valuation), an application (e.g. international, comparative), or an analytic method (history philosophy, political economy) of their choice

A. Admissions criteria

Graduate Students: While the certificate assumes no specific legal training, it is aimed at those seeking knowledge of the law as it affects our relationship to the environment and needs to be open to those with a background in either the social or natural sciences (or both). Admission will therefore require a BA/BS or its equivalent which includes a minimum of two courses in the social sciences and two courses in the natural sciences or mathematics, as well as competence in the English language. For those students who may need additional background in either the social or natural sciences, specific relevant prerequisite courses will be required and chosen in consultation with the student's advisor

On the matter of undergraduate students in these courses, environmental studies is unique in that it trains the student not just to engage in but to facilitate a conversation between various professionals and the public about specific environmental problems. This being the case, it is important for students to be in mixed groups by both discipline and level of advancement so that the professional learns to communicate with those who are not fully-trained lawyers or engineers while apprentices learn to reach intellectually in order to understand topics at a deeper and more multi-faceted set of levels. In this way as well, all students are commonly trained to facilitate cross-disciplinary analysis about a single natural dilemma, and thus a core pedagogical goal of environmental studies is achieved. Because there are over 20 other courses in the undergraduate ES curriculum for the students to choose from we expect that only the most highly motivated juniors or seniors will wish to enroll in any of these classes. Thus, we anticipate that the presence of these undergraduates will enrich and not dilute the graduate experience. In addition, given the limited number of EI social science faculty, this is the best use of personnel resources and we also note that ample precedent exists for such mixed course make up in current Lehigh social science graduate programs (e.g. Political Science, History)

B. Specific program requirements, including specific required and elective courses

Specifically, the certificate program will be a four course program where the students will take at least one course from each of the two core groups and two other courses from either the core groups or electives in consultation with the student's advisor (course descriptions for new courses attached/numbers cleared by registrar's office). No more than 6 credits can be taken at the 300 level and the course of study must be completed in a maximum of 3 years:

Core Courses In Environmental Law:

- 331/431: U.S. Environmental Law I: Pollution & Risk Abatement (Gillroy)
- 432: U.S. Environmental Law II: Natural Resources & Public Lands (Gillroy)
- 333 (IR 333) / 433: International Environmental Law & Policy (Gillroy)
- 343 (IR 343) / 443: Comparative Environmental Law & Policy (Gillroy)

Core Courses In Policy Analysis, Valuation & The Law:

- 435: Environmental Valuation For Policy Design & Legal Analysis (Holland)
- 336/436: Environmental Justice & The Law (Holland)
- 338/438: Environmental: Risk Perception & Communication (New Hire)
- 437: Environmental Risk: Decision Making & Management (New Hire)

Elective Courses: Because elective courses are offered by other departments we cannot anticipate in advance what will be taught or when, however, it will be our policy to encourage certificate students to take all of their courses from ES core offerings unless, in consultation with their advisor, a specific elective is uniquely pertinent to their studies. Then electives will be chosen by the student from already existing courses at the 300/400 level in consultation with their advisor. For example, Environment, Risk Regulation and Policy (CEE 272), or Environmental Remediation and Control Technologies (CEE 300), or American Environmental History (HIST 315) may be appropriate for particular students.

6. Academic Impact

A. Is the proposed new program interdisciplinary?

This program accepts and trains students from all disciplines. Due to its focus on the environment and public policy (two interdisciplinary subjects) it is inherently interdisciplinary.

B. Identify any known effects of the proposed new program on other programs at the University.

We can see no negative impacts on any other program as no other entity on campus teaches law or policy within a focused program centered on the environment. Political Science teaches some policy courses within its MA but the only course specifically aimed at environmental policy (POLS 328) is principally for undergraduates. The only other law courses (pp.289-90 in Catalog) are either undergraduate courses or focused upon business law. Therefore, this certificate will have a positive impact by filling a void not only for our own students but for those in the greater area looking for a legal program in the environment requiring less than three years of law school.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new program and the following information provided:

(1) Who was consulted?

NA

(2) Is the proposed new program acceptable to all other programs affected?

NA

(3) Will any changes be required in the affected programs? If so, please describe below:

NA

D. Does the proposed new program affect the University's commitment to diversity in any way? If so, please describe below:

NA

7. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement

The library resources being created for the undergraduate program in environmental studies will be adequate to support this certificate. There was a full library impact statement created for the Environmental Initiative as a whole that is still pertinent here. The Library impact was reviewed in September, 2005 with Brian Simboli and LTS staff. The library needs of EI's degree programs, and the certificate were discussed.

(2) Computer impact statement

We anticipate none except those connected with the increase in graduate students who come to the program

(3) Faculty impact statement

This program will depend on eight new courses to be "ES" courses at the 300/400 level. Taught in the evenings these courses will be supervised by the two current hires in the EI (J.M. Giffroy and B. Holland) and the yet to be

hired person for Environmental Risk (search ongoing). Professor Giltroy will teach two courses each Spring (Environmental Law I with International Environmental Law & Policy or Environmental Law II with Comparative Environmental Law & Policy). Professor Holland will teach one of her courses each Fall and the new Risk hire will teach one course in the Fall and one in the Spring. This will allow us to field two courses in the Fall of 2006 and three in the Spring of 2007 for a total of five in the 2006-2007 academic year and thereafter. This total does not include any electives scheduled by other departments. It should also be noted that these courses will be taught anyway as part of each instructor's designated course load and will become a core part of the planned MA program.

(4) Facilities impact statement

We anticipate none, other than classroom use.

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

This is a program of the Environmental Initiative. The certificate program does not require any new resources and thus will have no negative financial impacts. Rather, it is designed to be a revenue generator for the Environmental Initiative and the University at large.

APPENDIX: New 'ES' Certificate Course Descriptions:
(300 level courses, 4 credits; 400 level courses, 3 credits)

331/431: U.S. Environmental Law I: Pollution & Risk Abatement

The purpose of this course is to study the practical reality of environmental regulation as codified law. It is also aimed at understanding the law's foundation in argument and justification as both existing law and proposed policy. We shall approach the reading of cases, statutes, and regulations on air, water, risk, waste and environmental impact with two theoretical models: the Market Sector Approach and the Ecosystem Approach, each with a distinct process model raised upon distinctive sets of normative principles. Utilizing these two legal paradigms for charting the relationship between humanity and nature, we will examine a wide range of environmental law being aware of its ethical, political, economic, scientific, and policy dimensions. (Gillroy)

432: U.S. Environmental Law II: Natural Resources & Public Lands

The purpose of this course is to combine a study of natural resources law with an understanding of the politics and legal processes that create, change, and regulate the economic use of nature. We shall approach extraction law with two models of regulation: the Market Sector Approach and the Ecosystem Approach. Utilizing these two standards for charting the relationship between humanity and nature, we will analyze timber, water, mineral extraction, public lands regulations, wildlife, wilderness and federal planning and environmental impact assessment in terms of its ethical, political, economic and policy components. Our goal is to acquire a full grasp of the legal dynamics of extraction as it applies to the use of nature, not only as the existing positive law describes it, but as alternative moral and legal imperatives say it could be in the future. (Gillroy)

333 (IR 333) / 433: International Environmental Law & Policy

This course examines the basic international legal setting for the protection and management of the environment. It examines how international law is made and applied, the role of international environmental regimes or institutions, enforcement strategies, and compliance mechanisms. Emphasis will be placed on human rights and the environment, the interface of free trade and environmental protection, the protection of biodiversity, North-South issues, as well as a review of various regulatory regimes for the protection of the global commons, including the history and legal sources of the Global Climate Change Convention. (Gillroy)

343 (IR 343) / 443: Comparative Environmental Law & Policy

This course will study the different ways in which domestic legal systems handle the regulation of humanity's relationship to the natural world. The first part of the course will be a study of comparative law that will examine the evolution of distinct types of legal systems from their origins in the ancient world (e.g. Roman Law). The second part of the course will specifically and comparatively examine environmental law as it has developed in Canada, China, the European Union and the United States. Overall, we are interested in exploring the range of alternatives for environmental law and policy as practiced in various parts of the world and in creating arguments not only about how environmental law is created but the pros and cons of the different ways humanity has found to regulate its relationship to nature. (Gillroy)

435: Environmental Valuation For Policy Design & Legal Analysis

Review of history and legal context giving rise to current use of the "contingent valuation method" for pricing environmental resources. Assessment of the empirical and normative strengths of this method, as well as the weaknesses that challenge its effectiveness and political legitimacy. Evaluation of the recent turn to "deliberative" methods of resource valuation. Consideration of empirical and normative problems deliberative methods address and problems that remain. Common problems that challenge resource valuation, such as the influence of uninformed preferences, difficulties that arise in monetizing ecological goods and services, and bias that results from differences in individual wealth and power. (Holland)

336/436: Environmental Justice & The Law

An in-depth exploration of the various ways in which environmental law and policy can have discriminatory effects. Rise and evolution of the environmental justice movement. Impact of environmental justice claims on administrative rulemaking at both the state and federal level. History of case law concerning environmental justice suits filed under the 1964 Civil Rights Act. The future of environmental justice in environmental law and policy (Holland)

338/438: Environmental Risk: Perception & Communication

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on risk as it is perceived from outside the institutional policy process and how risk dilemmas are communicated from that institutional structure to experts and the public at large. This course will examine perception and communication experiences within the United States, and abroad.

437: Environmental Risk: Decision Making & Management

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on the internal dynamics of the risk policy process in terms of the formulation of law and policy in response to the characteristics of various risk dilemmas. Alternative policy paradigms for risk choices and the management of environmental risk will be examined as will the standing law regulating risk in the United States, abroad, and in terms of international governance

**Environmental Initiative
Environmental Law & Policy Certificate Courses
Submitted October 2005
Revised and Resubmitted February 2006**

Proposed New Courses

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 331/431: U.S. Environmental Law I: Pollution & Risk Abatement (4/3 credits respectively)

The purpose of this course is to study the practical reality of environmental regulation as codified law. It is also aimed at understanding the law's foundation in argument and justification as both existing law and proposed policy. We shall approach the reading of cases, statutes, and regulations on air, water, risk, waste and environmental impact with two theoretical models: the Market Sector Approach and the Ecosystem Approach, each with a distinct process model raised upon distinctive sets of normative principles. Utilizing these two legal paradigms for charting the relationship between humanity and nature, we will examine a wide range of environmental law being aware of its ethical, political, economic, scientific, and policy dimensions. (Gillroy)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study or other) and number of contact hours per week:

Lecture, reading, and discussion. 3 contact hours

3. Rationale for proposed new course:

The purpose of this course is to study the practical reality of environmental regulation as codified law. It is also aimed at understanding the law's foundation in argument and justification as both existing law and proposed policy. It will support both the new certificate in Env. Law and Policy, and the planned MA in Env. Policy design.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed? no

**B. Identify any known effects of the proposed new course on other programs at the University.
No known effects.**

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so please describe below:

**D. Does the proposed new course affect the University's commitment to diversity in any way?
If so, please describe below: No**

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement – Covered in EI library impact statement

(2) Computer impact statement None

(3) Faculty impact statement- the course is part of the expected course load for the joint EI faculty

(4) Facilities impact statement no impact

B. Provide a statement indicating who will assume financial responsibility for any new resources required: EI

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 432: U.S. Environmental Law II: Natural Resources & Public Lands (3 credits)

The purpose of this course is to combine a study of natural resources law with an understanding of the politics and legal processes that create, change, and regulate the economic use of nature. We shall approach extraction law with two models of regulation: the Market Sector Approach and the Ecosystem Approach. Utilizing these two standards for charting the relationship between humanity and nature, we will analyze timber, water, mineral extraction, public lands regulations, wildlife, wilderness and federal planning and environmental impact assessment in terms of its ethical, political, economic and policy components. Our goal is to acquire a full grasp of the legal dynamics of extraction as it applies to the use of nature, not only as the existing positive law describes it, but as alternative moral and legal imperatives say it could be in the future. (Gillroy)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, and discussion. 3 contact hours

3. Rationale for proposed new course:

The purpose of this course is to combine a study of natural resources law with an understanding of the politics and legal processes that create, change, and regulate the economic use of nature. It will support both the new certificate in Env. Law and Policy, and the planned MA in Env. Policy design

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed? no

B. Identify any known effects of the proposed new course on other programs at the University.
No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way?
If so please describe below: No

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** – Covered in EI library impact statement

(2) **Computer impact statement** None

(3) **Faculty impact statement**- the course is part of the expected course load for the joint EI faculty

(4) **Facilities impact statement** no impact

B. Provide a statement indicating who will assume financial responsibility for any new resources required: EI

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 333 (ER 333) / 433: International Environmental Law & Policy (4/3 credits respectively)

This course examines the basic international legal setting for the protection and management of the environment. It examines how international law is made and applied, the role of international environmental regimes or institutions, enforcement strategies, and compliance mechanisms. Emphasis will be placed on human rights and the environment, the interface of free trade and environmental protection, the protection of biodiversity, North-South issues, as well as a review of various regulatory regimes for the protection of the global commons, including the history and legal sources of the Global Climate Change Convention. (Gillroy)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, discussion. 3 contact hours per week

3. Rationale for proposed new course:

This course examines the basic international legal setting for the protection and management of the environment. The course will support both the new certificate in Environmental Law and Policy and the forthcoming MA in Environmental Policy

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

No.

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

Covered in EI Library Impact Statement

(2) Computer impact statement (attach statement if provided by LTS)

None

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

The course is part of the expected course load for the joint EI faculty members.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

None.

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

EI operating funds.

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 343 (IR 343) / ES 443: Comparative Environmental Law & Policy (4/3 credits respectively)

This course will study the different ways in which domestic legal systems handle the regulation of humanity's relationship to the natural world. The first part of the course will be a study of comparative law that will examine the evolution of distinct types of legal systems from their origins in the ancient world (e.g. Roman Law). The second part of the course will specifically and comparatively examine environmental law as it has developed in Canada, China, the European Union and the United States. Overall we are interested in exploring the range of alternatives for environmental law and policy as practiced in various parts of the world and in creating arguments not only about how environmental law is created but the pros and cons of the different ways humanity has found to regulate its relationship to nature. (Gillroy)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, discussion. 3 contact hours per week.

3. Rationale for proposed new course:

This course will study the different ways in which domestic legal systems handle the regulation of humanity's relationship to the natural world. The course will support both the new certificate in Environmental Law and Policy and the forthcoming MA in Environmental Policy

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

No.

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

Covered in EI Library Impact Statement

(2) Computer impact statement (attach statement if provided by LTS)

None.

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

The course is part of the expected courseload for the joint EI faculty members.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

None.

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

EI operating funds.

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 435: Environmental Valuation for Policy Design and Legal Analysis (3 credits)

Review of history and legal context giving rise to current use of the "contingent valuation method" for pricing environmental resources. Assessment of the empirical and normative strengths of this method, as well as the weaknesses that challenge its effectiveness and political legitimacy. Evaluation of the recent turn to "deliberative" methods of resource valuation. Consideration of empirical and normative problems deliberative methods address and problems that remain. Common problems that challenge resource valuation, such as the influence of uninformed preferences, difficulties that arise in monetizing ecological goods and services, and bias that results from differences in individual wealth and power. (Holland)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, discussion. 3 contact hours per week.

3. Rationale for proposed new course:

Review of history and legal context giving rise to current use of the "contingent valuation method" for pricing environmental resources. The course will support both the new certificate in Environmental Law and Policy and the forthcoming MA in Environmental Policy

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

No known effects

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? if so, please describe below:

No.

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

Covered in EI Library Impact Statement

(2) Computer impact statement (attach statement if provided by LTS)

None.

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

The course is part of the expected course load for the joint EI faculty members.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

None

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

EI operating funds.

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 336/436: Environmental Justice and the Law (4/3 credits respectively)

An in-depth exploration of the various ways in which environmental law and policy can have discriminatory effects. Rise and evolution of the environmental justice movement. Impact of environmental justice claims on administrative rulemaking at both the state and federal level. History of case law concerning environmental justice suits filed under the 1964 Civil Rights Act. The future of environmental justice in environmental law and policy. (Holland)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study or other) and number of contact hours per week:

Lecture, reading, discussion. 3 contact hours per week.

3. Rationale for proposed new course:

An in-depth exploration of the various ways in which environmental law and policy can have discriminatory effects. The course will support both the new certificate in Environmental Law and Policy and the forthcoming MA in Environmental Policy.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so please describe below:

No.

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

Covered in EI Library Impact Statement

(2) **Computer impact statement** (attach statement if provided by LTS)

None

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

The course is part of the expected course load for the joint EI faculty members.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

None.

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

EI operating funds.

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 437: Environmental Risk Decision Making & Management (3 credits)

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on the internal dynamics of the risk policy process in terms of the formulation of law and policy in response to the characteristics of various risk dilemmas. Alternative policy paradigms for risk choices and the management of environmental risk will be examined as will the standing law regulating risk in the United States, abroad, and in terms of international governance. (new Risk hire)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, and discussion. 3 contact hours

3. Rationale for proposed new course:

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on the internal dynamics of the risk policy process in terms of the formulation of law and policy in response to the characteristics of various risk dilemmas. It will support both the new certificate in Env. Law and Policy, and the planned MA in Env. Policy design.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed? no

B. Identify any known effects of the proposed new course on other programs at the University.
No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way?
If so, please describe below: No

5. Resource impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** - Covered in EI library impact statement

(2) Computer impact statement None

(3) Faculty impact statement- the course is part of the expected course load for the joint EI
faculty

(4) Facilities impact statement no impact

**B. Provide a statement indicating who will assume financial responsibility for any new
resources required: EI**

1. Proposed new course number and course description (as it will appear in course catalogue):

ES 338/438: Environmental Risk: Perception & Communication (4/3 credits respectively)

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on risk as it is perceived from outside the institutional policy process and how risk dilemmas are communicated from that institutional structure to experts and the public at large. This course will examine perception and communication experiences within the United States and abroad. (new Risk hire)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture, reading, and discussion. 3 contact hours

3. Rationale for proposed new course:

Starting with the distinction between traditional pollution problems and environmental risk, this course will focus on risk as it is perceived from outside the institutional policy process and how risk dilemmas are communicated from that institutional structure to experts and the public at large. It will support both the new certificate in Env. Law and Policy, and the planned MA in Env. Policy design

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed? no

B. Identify any known effects of the proposed new course on other programs at the University.
No known effects.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way?
If so, please describe below: No

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement – Covered in EI library impact statement

(2) Computer impact statement None

(3) Faculty impact statement- the course is part of the expected course load for the joint EI faculty

(4) Facilities impact statement no impact

B. Provide a statement indicating who will assume financial responsibility for any new resources required: EI

GRC Submission
College of Education:
Educational Technology & Technology-based Teacher Education Programs

Proposed Changes in MS in Instructional Technology Program

1. Name and summary of current program:

M.S. in Instructional Technology: A thirty-credit masters degree offered through the Educational Technology program in the College of Education. Program is aimed at those interested in the use of technology in education, particularly pre-K-12 settings.

2. Proposed program changes (as they will appear in the catalog):

See bottom on next page for existing approved degree course requirements and page 3 for the proposed new version.

3. Description of proposed change(s):

- Modify course listing to show correct course numbers and titles.
- Collapse 6 categories of course requirements to 3 broader categories.
- Focus coursework more on planning and implementing technology than on design and development.

4. Rationale for proposed change(s):

This degree was approved in 2000. We originally planned it to be offered completely online to an international audience. At that time, the Technology-based Teacher Education (TBTE) program was offering few courses that seemed suited to this degree and the Ed Tech program and the TBTE program were completely separate academic programs, but were in very early stages of pursuing ways to collaborate and share greater focus.

The TBTE and EdT programs are now preparing to merge and there are courses that meet requirements in both programs. The MS in Instructional Technology (InsTech) appears to have domestic appeal and we are drawing students locally to take courses face-to-face. It appears we can continue to support the needs of international students with one or two online courses each year and allow our InsTech MS students to take those courses as part of their program. By changing the program requirements, we will be able to make better use of existing faculty in the now merged program and align masters and doctoral program coursework, increasing numbers in into doctoral courses.

5. Academic Impact Statement:

a. Is this proposed program change interdisciplinary?

No

b. Identify any known effects of the proposed program change on other programs at the University.

The only changes relate to the impending merger between EdT and TBTE. The proposed changes support all masters and doctoral degrees offered by the faculty in the soon-to-be-merged two programs.

c. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed program change and the following information provided:

(1) Who was consulted?

All faculty in the two existing academic programs.

(2) Is the proposed program change acceptable to the affected programs?

The faculty have discussed the proposed changes and voted unanimously to approve them. Thus changes in course offerings, scheduling, and course staffing have been approved by the very faculty involved.

(3) Will any changes be required in the affected programs? If so, describe.

There will be some course staffing changes, but—as noted above—these have been discussed and approved by the faculty involved with all degree programs.

d. Identify any known effects of the proposed program change on the University's commitment to diversity.
NONE.

6 Resource Impact Statement:

a. Provide each of the following:

(1) Library impact statement

No changes. Existing library allocations already cover sufficient normal increments to holdings. We presently subscribe to appropriate journals.

(2) Computer impact statement

No change from existing

(3) Faculty impact statement

Faculty who formerly focused on instructional design and development have had their loads modified to allow them to teach courses that support this masters. The former instructional design and development masters has suspended admissions for the present

(4) Facilities impact statement

No changes.

b. Provide a statement indicating who will assume financial responsibility for any new resources required:

No anticipated need for additional resources. The change from having two active masters degrees focused on the use of technology to having a single active masters program should make it easier to cover courses

Existing Approved Program of Study:

Masters of Science in Instructional Technology (30 hours)

Course Category	Course	Credits
College	<input type="checkbox"/> Educ 403. Research (3)	6
	<input type="checkbox"/> Educ 471. Diversity and Multicultural Perspectives (3)	
Foundations	<input type="checkbox"/> EdT 401. Technology-based Teaching & Learning 1: Problems and Methods (3)	6
	<input type="checkbox"/> EdT 402. Technology-based Teaching & Learning 2: Implementation & Assessment (3)	
Technology-based Content Delivery	<input type="checkbox"/> EdT 432. Website and Resource Development (3)	3
Design Skills	<input type="checkbox"/> EdT 431. Multimedia Interface Design (3)	3
	<input type="checkbox"/> EdT 433. Instructional Design (3)	
Technology Implementation	<input type="checkbox"/> EdT 470. Technology Across the Curriculum (3)	6
	<input type="checkbox"/> EdT 471. Planning for Implementing Technology in School Settings (3)	
Advanced Work	<input type="checkbox"/> EdT 491. Advances Seminar in Educational Technology (topic changes) (1-5) (3)	3
	<input type="checkbox"/> EdT 492. Research Topics in Educational Technology (topic changes) (3)	
	<input type="checkbox"/> Electives as approved by program coordinator	
TOTAL CREDIT HOURS:		30

Proposed Revised Program of Study:

Master's of Science in Instructional Technology
(30 credit hour minimum)

Course Category	Course Number and Title	Credits
College Core Requirements	<input type="checkbox"/> EDUC 403. Research (3)	6
	<input type="checkbox"/> EDUC 471. Diversity and Multicultural Perspectives (3)	
Content Area Requirements	<input type="checkbox"/> TBTE 401. Overview of Learning Sciences and Technology (3)	15
	<input type="checkbox"/> TBTE 403. Learning Environments (3)	
	<input type="checkbox"/> TBTE 406. Tools for K-12 Teaching and Learning (3)	
	<input type="checkbox"/> TBTE 407. Designing Tools for Teaching and Learning (3)	
	<input type="checkbox"/> EDT 432. Development of Website & Resource Development for Learning (3)	
Electives	<input type="checkbox"/> EDT 471. Planning for Implementing Technology in School Settings (3)	6
	<input type="checkbox"/> TBTE 415. Technology in School Settings <subtitle> (1-3)	
	<input type="checkbox"/> EDT 415. Topics In Educational Technology <subtitle> (1-3)	
	<input type="checkbox"/> EDT 472. Integrating Technology into Classroom Teaching: <subtitle> (3)	
	<input type="checkbox"/> EDT 470. Technology Across the Curriculum (3)	
	<input type="checkbox"/> EDT 485. Applied Research in Educational Technology (3)	
	<input type="checkbox"/> EDUC 493. Internship in <subtitle> (3)	
	<input type="checkbox"/> EDUC 495. Independent Study in <subtitle> (1-6)	
<input type="checkbox"/> EDUC 491, 492. Advanced Seminars <subtitle> (1-6)		
	<input type="checkbox"/> Other electives as approved by advisor (0-6)	
TOTAL CREDIT HOURS		30

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Proposed Changes in Technology Use in the Schools Grad Certificate

1. Name and summary of current certificate:

Technology Use in the Schools: A twelve-credit graduate certificate offered through the Educational Technology program in the College of Education. Certificate is aimed at those interested in the use of technology in school settings.

2. Proposed program changes (as they will appear in the catalog):

See next page for existing approved certificate course requirements and the proposed new version.

3. Description of proposed change(s):

- Collapse 2 categories of course requirements into one broad category
- Add two additional courses to the eligible courses list
- Allow students to choose 4 of six possible courses = approved electives.

4. Rationale for proposed change(s):

EdT401 is no longer being taught. We offer some courses only on an annual basis and need to enable students to complete this certificate in summer + fall + spring+ summer. Fulltime students should also be able to complete it more quickly. Two courses (TBTE 406 and 407) were not available when we had the certificate approved. Adding them to the certificate is in keeping with the intent of the certificate and one or the other is offered in every semester with both offered in the summer.

5. Academic Impact Statement:

a. Is this proposed program change interdisciplinary?

No

b. Identify any known effects of the proposed program change on other programs at the University.

The only changes relate to the impending merger between EdT and TBTE. The proposed changes support all masters and doctoral degrees offered by the faculty in the soon-to-be-merged two programs.

c. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed program change and the following information provided:

(1) Who was consulted?

All faculty in the two existing academic programs

(2) Is the proposed program change acceptable to the affected programs?

The faculty have discussed the proposed changes and voted unanimously to approve them. Thus changes in course offerings, scheduling, and course staffing have been approved by the very faculty involved.

(3) Will any changes be required in the affected programs? If so, describe.

There will be some course staffing changes, but --as noted above--these have been discussed and approved by the faculty involved with all degree programs.

d. Identify any known effects of the proposed program change on the University's commitment to diversity.

NONE.

6. Resource Impact Statement:

a. Provide each of the following:

(2) Library impact statement

No changes.

College of Ed: EdT & TBTE: Changes to Instructional Technology MS Program & Grad Certificate /5

(2) Computer impact statement

No change from existing

(3) Faculty impact statement

Faculty teaching load realignments already mean these courses will be covered

(4) Facilities impact statement

No changes.

b. Provide a statement indicating who will assume financial responsibility for any new resources required:

No anticipated need for additional resources.

Existing Approved Program of Study:

Technology Use in the Schools Certificate Program
(12 credit hour minimum)

Course Category	Course Number and Title	Credits
Foundations	<input type="checkbox"/> EdT 401. Foundations of Educational Technology (3)	3
Technology Implementation and Integration (pick at least 2 different courses)	<input type="checkbox"/> EDT 470. Technology Across the Curriculum (3)	9
	<input type="checkbox"/> EDT 471. Planning for Implementing Technology in School Settings (3)	
	<input type="checkbox"/> EDT 472. Integrating Technology into Classroom Teaching: <subtittle> (3)	
	<input type="checkbox"/> <i>Elective as approved by program coordinator (0-3)</i>	

Proposed Revised Program of Study:

Technology Use in the Schools Certificate Program
(12 credit hour minimum)

Course Category	Course Number and Title	Total Credits
Technology Implementation and Integration (pick at least 4 courses)	<input type="checkbox"/> EDT 470. Technology Across the Curriculum (3)	12
	<input type="checkbox"/> EDT 471. Planning for Implementing Technology in School Settings (3)	
	<input type="checkbox"/> EDT 472. Integrating Technology in Classroom Teaching: <subtittle> (3)	
	<input type="checkbox"/> EDT 432. Development 1: Website and Resource Development for Learning	
	<input type="checkbox"/> TBTE 406. Tools for K-12 Teaching and Learning	
	<input type="checkbox"/> TBTE 407. Designing for K-12 Teaching and Learning	
	<input type="checkbox"/> <i>Elective as approved by advisor (0-3)</i>	

Graduate Course and Curriculum Changes: 2005-2006 (to become effective F2006)

- 1. Termination of Degree Programs in Pharmaceutical Chemistry—p. 2**
- 2. Courses:**
 - A. Biological Sciences—p. 4**
 - B. Physics—p. 7**
 - C. Political Science—p. 10**
 - D. Sociology & Anthropology—p. 12**

October 24, 2005

Stephen Cutcliffe
Associate Dean, Graduate Studies
College of Arts & Sciences
Lehigh University
Bethlehem, PA 18015

RE: Termination of Degree Program in Pharmaceutical Chemistry

Dear Steve,

On Friday, September 23, 2005 the Chemistry Department met to discuss a number of issues. One of the items on the agenda was termination of the degree program in pharmaceutical chemistry. There was a good deal of discussion and I agreed to allow a vote by email two weeks after the meeting so everyone had time to reflect on the discussion. On October 5th I sent an email to the faculty and asked for a vote on the motion to terminate the degree program in pharmaceutical chemistry. I gave a deadline of October 7th for the vote. The faculty voted overwhelmingly in favor of terminating the degree program. The overall view of the faculty in the Department of Chemistry is the program in Pharmaceutical Chemistry is unsustainable once the faculty member who runs it retires. After careful evaluation of the problems associated with the degree program, the faculty have decided it is best to focus on our MS and PhD degree programs in Chemistry and strengthen them in a way that incorporates the needs of students, faculty, Department, and the University.

Since I could not find any paperwork for terminating a program, I have outlined issues related to academic and resource impact below.

Academic Impact:

- A. The program is interdisciplinary and is shared with Biological Sciences.
- B. Linda Lowe-Krentz in Biological Sciences has been consulted about the termination of the program and she said there would be minimal impact on Biological Sciences since so few students are enrolled in the program. The Department Chair, Neal Simon has been notified about the termination as well and had no problems with the decision.
- C. No changes will be required in affected programs (Chemistry and Biological Sciences).
- D. While students will no longer be accepted into the program, all students presently enrolled in the program will be allowed to complete it for the duration required by University policies (6 years for an MS, etc.). With existing faculty members and continued judicious use of adjuncts now teaching courses in this program, we anticipate

no problem serving the needs of the approximately 50 students currently enrolled, many of whom are nearing completion of their programs already. Students who meet the background requirements for the degree programs in chemistry will be allowed to switch from the MS pharmaceutical chemistry program to the M.S. chemistry program if they choose to do so. Since the program in pharmaceutical chemistry is being terminated, MS chemistry students will not be able to switch into the pharmaceutical chemistry program.

Resource Impact:

A. Since most of the students enrolled in the program are through distance education, there may be a short-term impact on revenue to the distance office and the department. We also offer the MS in chemistry through distance education and have a substantial number of students enrolled in that program. It is our intent to strengthen and market this program as we are winding down the program in Pharmaceutical Chemistry. Furthermore, we will still be offering the certificate programs in Analytical Principles of Pharmaceutical Science, BioOrganic Principles of Pharmaceutical Science, and Regulatory Affairs in a Technical Environment. Further enrollment in these programs should also offset the loss of enrollment in the Pharmaceutical Chemistry program.

B. Terminating this program will allow the faculty to focus solely on the graduate degree programs in chemistry and use our resources to strengthen these programs, which are the backbone of a modern Chemistry Department.

If you have any questions about this document, or require any further information, please don't hesitate to contact me.

Sincerely,

Bob Flowers

BIOLOGICAL SCIENCES

Course changes for BIOS

1. Courses dropped:

BIOS 419. Bacterial Genetics (3)

BIOS 463. Advances in Plant Molecular Biology (3)

Rationale: These courses have not been offered for many years and there is no plan to offer them in the foreseeable future.

3. Other changes:

BIOS 425. Male Reproductive Biology (1 – 3)

Molecular, cellular, and genetic aspects of the mammalian male reproductive system. Prerequisite: permission of the instructor.

Change Requested: Change in credits [from (2 or 3) to (1 – 3)] and prerequisite.

Rationale for Change: More accurately reflects nature of course as it is presently offered. Change requested by Professor Barry Bean who offers this course.

4. Impacts of course changes:

No impact on curricula, faculty teaching loads, or budgets, nor on the libraries, computing, or facilities

CAS: Biological Sciences

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

BIOS 456. Human Genetics and Reproduction (3)

Frontiers in human genetics, including simple and complex genetic diseases, cancers. Emphasis on genes and structures that enable reproductive processes; genetic functions of mammalian germ lines. Analysis of current publications.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

3. Rationale for proposed new course:

Course as been offered several times as 'BIOS 496'. It is now a regular offering and should have a regular course number.
Change requested by Professor Barry Bean who offers this course.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

No effects anticipated; course has been taught previously with no impacts.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

NA

(2) Is the proposed new course acceptable to all other programs affected?

NA

(3) Will any changes be required in the affected programs? If so, please describe below:

NA

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

NA

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

No impact; Library current holdings more than sufficient.

(2) Computer impact statement (attach statement if provided by LTS)

No impact

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

No impact; course will be an integral part of Prof. Bean's regular course rotation.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

No additional facilities needed.

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

No new resources will be required

College of Arts and Science: Physics Department

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

Physics 482 Applied Optics (3 credits)

Review of ray and wave optics with extension to inhomogenous media, polarized optical waves, crystal optics, beam optics in free space (Gaussian and other types of beams) and transmission through various optical elements, guided wave propagation in planar waveguides and fibers (modal analysis), incidence of chromatic and polarization mode dispersion, guided propagation of pulses, nonlinear effects in waveguides (solitons), periodic interactions in waveguides, acousto-optic and electro-optics

Prerequisite: Physics 352 or equivalent

Instructor: Toulouse

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study or other) and number of contact hours per week:

Lecture, 3 hours a week

3. Rationale for proposed new course:

This course is an advanced course intended for senior students and graduate students interested in careers in optics.

Given the new Optics and Photonics activity on campus, and in the context of the Center for Optical Technologies and the Masters of Photonics introduced two years ago, it is important that the Physics Department offer another optics course beyond the basic courses presently offered: Modern Optics and Laser and Nonlinear Optics. The new course proposed bridges the gap between these two basic courses and the engineering courses offered in the Electrical and Computer Engineering Department or the optics knowledge required to pursue research in the field. The course has already been taught twice as a Special Topics course (Phys. 372-472), in the spring of 2003 and in the spring of 2005. It has been well attended with approximately 6 students both times and has a well developed syllabus. If included in the catalogue, we expect the attendance to grow further.

The general title chosen, Applied Optics, leaves the freedom required for different versions of the course.

4. Academic impact on programs affected by new course:

The course proposed can serve physics, electrical engineering and materials science students. It is a very useful addition to the Masters of Photonics program electives

A. Is the proposed course to be cross-listed?

Not at this time

B. Identify any known effects of the proposed new course on other programs at the University.

Only positive effects are expected. This course will fill a definite gap between the basic Optics courses offered in Physics and the specialized optical engineering courses offered in ECE.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

This course will first be introduced as a Physics course, as it has already been offered twice. There are no effects that we know of that would require consultation.

(1) Who was consulted?

Department of Physics faculty (which includes Thomas Koch, FCE and Director, Center for Optical Technologies, and Jeff Rickman, Mat.Sci., both of whom have joint appointments in Physics). Neither ECE nor MatSci. are directly affected by the offering of the course, but at least those individual members are aware of the course and are in a position to make its availability known to potentially interested engineering students in those departments.

(2) Is the proposed new course acceptable to all other programs affected?

Yes

(3) Will any changes be required in the affected programs? If so, please describe below:

No

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

Not applicable

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

There will not be any immediate impact on the library holdings beyond that of individual book requests. The library already holds a number of books in Applied Optics and we shall continue to suggest new acquisitions as we would normally do.

(2) Computer impact statement (attach statement if provided by LTS)

None

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

This course will be offered as part of the regular departmental offerings and will not require additional faculty to staff it. This being an advanced course, it will be taught every other year, and will not have an impact on the availability of other courses in Physics need to satisfy any degree requirements.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

No special impact

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Not applicable

COLLEGE OF ARTS & SCIENCES, DEPARTMENT OF POLITICAL SCIENCE

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

POLS 433 INTRODUCTION TO POLICY ANALYSIS

This course provides students with an understanding of the role analysis plays in the policy-making process with an emphasis on the American political system. Students are introduced to the interdisciplinary language of policy analysis as we consider the political, social and economic factors affecting policy processes and outcomes. Various models of analysis are considered as well as how analysis can be used to improve policy discussions. Students will become "critical consumers" of policy analysis through class discussion of the models and methods, processes and concepts of this "field" of study.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

LECTURE 3 CREDITS, 3 HOURS WEEKLY

3. Rationale for proposed new course:

The Political Science Department has offered this course to our graduate students for several semesters with an experimental number. The course has been very successful therefore we would like to add it to the catalog as a permanent graduate course.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

NO

B. Identify any known effects of the proposed new course on other programs at the University.

NONE

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

NO

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS)

(2) Computer impact statement (attach statement if provided by LTS)

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

This course will not require any new resources. Also, there will be no additional financial implications or responsibilities required because the course has been offered as part of our graduate schedule repeatedly for several semesters.

College of Arts & Sciences – Sociology & Anthropology

Proposed Course Changes

1. Current course number, title, course description, and credits (from present course catalogue):

SSP 401. Proseminar in Applied Social Theory (3)

Explores influential sociological theory, the differences between classical theoretical traditions, the main strengths and weaknesses of such traditions. Emphasis is placed on understanding the uses of theory in research, and the implications of theoretical models when applied to contemporary research and problems. Staff. **(SS)**

SSP 402. Sociology of Cyberspace (3)

The course focus is on case-based discussion in the social psychology and sociology of the Internet and the World Wide Web. Questions of what it means to be an individual online, how relationships develop, the nature of groups, democracy and power, and education are considered. Evaluation is based on short papers related to the cases and assigned readings, both in hard copy and online. Rosenwein. **(SS)**

SSP 411. Advanced Research Methods (3)

Study of quantitative and qualitative methodologies, measurement and research design issues at an advanced level. Specific methodologies include participant observation, survey/interview, laboratory or field methods, content analysis, and focus groups. Prerequisite: SR 111 or equivalent. Staff. **(SS)**

SSP 470. Social Theory (3)

Major trends in social science theory in historical context. Comparison of the major theoretical perspectives with an emphasis on underlying philosophy and the development of critical capacities in students. **(SS)**

SSP 477. Advanced Computer Applications (3)

Uses of computers in social sciences, including data collection, management, and analysis, simulations, and decision-making; includes weekly lab. **(SS)**

SSP 495. Methods in Observation (3) Naturalistic and participant observation in uncontrolled field settings. Students will carry out a field project. Tannenbaum **(SS)**

2. Proposed course number, title, course description, and credits (as it will appear in course catalogue):

SSP 401. Classical Social Theory (3)

Explores influential sociological theory, the differences among classical theoretical traditions, the main strengths and weaknesses of such traditions. Emphasis is placed on understanding the uses of theory in research, and the implications of theoretical models when applied to contemporary research and problems. Staff. **(SS)**

SSP 403. Sociology of Cyberspace (3)

The course focus is on case-based discussion in the social psychology and sociology of the Internet and the World Wide Web. Questions of what it means to be an individual online, how relationships develop, the nature of groups, democracy and power, and education are considered. Evaluation is based on short papers related to the cases and assigned readings, both in hard copy and online. Rosenwein. (SS)

SSP 411. Advanced Research Methods, Part I (3)

Study of quantitative and qualitative methodologies, measurement and research design issues at an advanced level. Specific methodologies include participant observation, survey/interview, laboratory or field methods, content analysis, and focus groups. Prerequisite: SR 111 or equivalent. Staff. (SS)

SSP 412. Advanced Research Methods, Part II (3)

Application of research methods to specific project, including design, data collection, and analysis. Focus on use of SPSS and other appropriate software. Prerequisite: SSP 411 or equivalent. Staff (SS)

SSP 493. Methods in Observation (3) Naturalistic and participant observation in uncontrolled field settings. Students will carry out a field project. Tannenbaum (SS)

3. Nature of proposed change(s)

A. Course title change? If so, provide rationale below:

SSP 401 has been a general theory course. Since we've decided to divide the teaching of theory into two courses, it will now cover classical theory and the new course—SSP 402—proposed separately, will cover Contemporary Theory (see Proposed New Course form).

We have also decided to change our required methods sequence, currently 411 and 477, to be a two-semester continuing course to be called 411 and 412. The titles reflect this change.

B. Course number change? If so, provide rationale below:

In order to create a second course in theory that follows from SSP 401, we request that the current SSP 402 be changed to 403.

495 is an experimental number per the Registrar – we need to assign a new number to this course which will be 493.

477 is to be changed to 412 to make it clearer that it follows from 411 as indicated in the change of title to Research Methods II.

C. Change in course credits? If so, provide rationale below: n/a

D. Change in course description? If so, provide rationale below:

The change in description for SSP 477, now to be 412, reflects our current plans for that course.

E. Other change(s)? If so, please describe below and provide rationale for each change.

REMOVE SSP 470 This is no longer taught. (previously replaced with SSP 401)

4. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

None

(2) **Computer impact statement** (attach statement if provided by LTS)

None—SSP 412 will require the same facilities as currently used in SSP 477

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

none

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

SSP 455 – Inequalities at Work (3) - The primary focus of this course is on race, gender, and class as axes of disadvantage and privilege in work and employment. We will explore both theories and empirical studies of inequality as well as their social, political, and practical ramifications for the workplace. This seminar-style course will rely heavily on student participation with guidance from the instructor. (SS) Krasas.

Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week: *Seminar*

Rationale for proposed new course: *No such existing course offered now.*

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed? *NO*

B. Identify any known effects of the proposed new course on other programs at the University.

NONE - ALTHOUGH STUDENTS IN OTHER SOCIAL SCIENCE PROGRAMS MIGHT FIND THE TOPIC INTERESTING AS AN ELECTIVE.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

YES, INCREASES COURSE OFFERINGS IN THIS AREA.

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LTS) - N/A

(2) Computer impact statement (attach statement if provided by LTS) - N/A

(3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty) - N/A - TAUGHT BY NEW FACULTY MEMBER WHO WAS BROUGHT HERE TO TEACH IN THIS AREA.

(4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities) - N/A

B. Provide a statement indicating who will assume financial responsibility for any new resources required: N/A

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

SSP 402. Contemporary Social Theory (3)

Explores post-WWII social theory, with a focus on debates over modernity and critical theory, feminism/multiculturalism, and rationality. Emphasis is placed on understanding the links between classical and contemporary theory, and the application of contemporary theory to current research and social problems (SS)

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Seminar once per week

3. Rationale for proposed new course:

One course in theory for graduate students is inadequate for covering any more than the classic thinkers. We desire to add a course that will address the more modern theories currently in use and being developed.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No

B. Identify any known effects of the proposed new course on other programs at the University.

none

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

no

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

none

(2) **Computer impact statement** (attach statement if provided by LTS)

none

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

We will require some reallocation of faculty time in order to cover a new course in theory.

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Rossin College of Engineering & Applied Science
Summary of GRADUATE Course & Curriculum Changes
2005-2006

Chemical Engineering

Delete CHE 421, 427, 445

Civil & Environmental Engineering

New Degree Programs

M.S. in Structural Engineering & Ph. D. in Structural Engineering

Computer Science & Engineering

Add CSE 408, 426, 431, 448

Electrical & Computer Engineering

New Course - ECE 4xx Introduction to Cryptography and Network Security (3)

Delete - ECE 473

Information and Systems Engineering

Program change - Change the core course IE 341 to IE 404

Mechanical Engineering

New Course - Mechxx - Introduction to Solid Mechanics (3)

Delete - ME 427 (ChE 427)

Engineering: Chemical Engineering

Proposed Course Changes

1. Current course number, title, course description, and credits (from present course catalogue):

CHE 421. Heat Transfer (3)

Analysis of steady and unsteady state transfer. Convection, conduction, and radiation. Vaporization and condensation. Heat transfer in high velocity flow in rarified gases. Applications.

2. Proposed course number, title, course description, and credits (as it will appear in course catalogue):

3. Nature of proposed change(s)

- A. Course title change? If so, provide rationale below:
- B. Course number change? If so provide rationale below:
- C. Change in course credits? If so, provide rationale below:
- D. Change in course description? If so, provide rationale below:
- E. Other change(s)? If so, please describe below and provide rationale for each change.

Delete course. It has not been given for a long time, and the department has no plans to offer it in the future.

4. Resource Impact

A. Provide impact statements in the four areas listed below:

- (1) **Library impact statement** (attach statement if provided by LTS)
- (2) **Computer impact statement** (attach statement, if provided by LTS)
- (3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)
- (4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Engineering: Chemical Engineering

Proposed Course Changes

1. Current course number, title, course description, and credits (from present course catalogue):

CHE 427. (ME 427) Multiphase Flow and Heat Transfer (3)

Heat transfer and fluid dynamics of multiphase systems. Subcooled, nucleate, and film boiling; bubble nucleation; dynamics of bubble growth and collapse; vapor-liquid cocurrent flow regimes; two-phase pressure drop and momentum exchange, low instabilities; convective-flow boiling; simultaneous heat and mass transfer. Prerequisite: CHE 421 or ME 321, or courses in the area of transport phenomena. Chen

2. Proposed course number, title, course description, and credits (as it will appear in course catalogue):

3. Nature of proposed change(s)

- A. Course title change? If so, provide rationale below:
- B. Course number change? If so, provide rationale below:
- C. Change in course credits? If so, provide rationale below:
- D. Change in course description? If so, provide rationale below:
- E. Other change(s)? If so, please describe below and provide rationale for each change.

Delete course. The department has no plans to offer it in the future.

4. Resource Impact

A. Provide impact statements in the four areas listed below:

- (1) Library impact statement (attach statement, if provided by LTS)
- (2) Computer impact statement (attach statement, if provided by LTS)
- (3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)
- (4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Engineering: Chemical Engineering

Proposed Course Changes

1. Current course number, title, course description, and credits (from present course catalogue):

CHE 445. Enzyme Engineering (3)

Enzyme characteristics including nomenclature, physical properties, kinetics, and assay methods with emphasis on practical application at commercial scale. Methods of enzyme production and purification. Design and analysis of industrial-scale reactors employing soluble and immobilized enzymes. Prerequisite: Consent of the instructor.

2. Proposed course number title, course description, and credits (as it will appear in course catalogue):

3 Nature of proposed change(s)

- A. Course title change? If so, provide rationale below:
- B. Course number change? If so, provide rationale below:
- C. Change in course credits? If so, provide rationale below:
- D. Change in course description? If so, provide rationale below:
- E. Other change(s)? If so, please describe below and provide rationale for each change.

Delete course. The course has not been offered in a long time and the department has no plans to offer it in the future.

4. Resource Impact

A. Provide impact statements in the four areas listed below:

- (1) **Library impact statement** (attach statement, if provided by LTS)
- (2) **Computer impact statement** (attach statement, if provided by LTS)
- (3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)
- (4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

P.C. Rossin College of Engineering and Applied Science
Department of Civil and Environmental Engineering

Master of Science (M.S.) in Structural Engineering
Ph.D. in Structural Engineering

1. Proposed new program mission statement

The mission of the proposed new degree programs is to educate graduate students in the principles and methods essential to the practice of Structural Engineering and essential to the advancement of knowledge in Structural Engineering. The programs will educate students through coursework and independent study and research. Graduates of these programs will be "full service engineers" with the knowledge and analytical problem-solving capabilities needed to lead and innovate within multi-disciplinary teams in technologically-complex environments.

2. Rationale for proposed new program

Lehigh currently has internationally recognized graduate research and education programs in Structural Engineering. The proposed degree programs will better reflect the well-established strengths and draw attention to future opportunities in Structural Engineering to prospective students, research sponsors and prospective employers. Most of the requirements and activities of these programs are contained within the Civil and Environmental Engineering (CEE) Department, and the graduates of these programs currently receive an M.S. or Ph.D. in Civil Engineering. Graduates of these programs, however, should have the option of earning a degree that is more closely associated with Lehigh's internationally recognized strength in Structural Engineering. Surveys of our graduate students (conducted in 2004 and 2005) show that our current graduate students prefer to earn an M.S. or Ph.D. in Structural Engineering, rather than an M.S. or Ph.D. in Civil Engineering, by a 3 to 1 margin (note that these new programs will not prevent students from choosing to earn a degree in Civil Engineering). Properly identifying these graduate programs as Structural Engineering programs will enable RCEAS and the CEE Department to more effectively market them and attract the finest graduate students. Furthermore, implementation of these new programs will continue to elevate Lehigh as a leader in Structural Engineering, helping to further strengthen our visibility in graduate research and education.

The current proposal for graduate degrees in Structural Engineering includes only a single track in Building and Bridge Structural Systems. The long-term vision, however, includes multiple tracks, that would include substantial coursework and research in departments other than CEE. For example, in cooperation with colleagues from several RCEAS departments, additional tracks in Structural Engineering, Mechanics, and Materials, and in Intelligent Infrastructure Systems could be developed in the near future. At such time, interdisciplinary degree programs of study will be proposed in consultation with the appropriate departments.

3. Description of proposed new program

A. Admissions criteria

(1) minimum requirements

Post-bachelor's degree *regular* admissions students must have at least one of the following:

- (1) Undergraduate GPA of at least 2.75 out of 4.0
- (2) GPA of at least 3.00 for the last two semesters of undergraduate study
- (3) Scores at or above the 75th percentile on the GRE
- (4) GPA of at least 3.00 on a minimum of 12 hours of graduate work at other institutions

Post-master's degree *regular* admissions students must have at least one of the following:

- (1) Graduate GPA of at least 3.0 out of 4.0.
- (2) Scores at or above the 75th percentile on the GRE

These conditions are necessary but not sufficient (see graduate handbook). Admission is competitive from the pool of applicants. In addition, applicants must supply other admissions materials, as described below.

(2) background courses required

None. Admitted students may, however, be required to take additional courses to remediate specific academic deficiencies.

(3) required examinations (for example, GRE, GMAT, and the like)

GRE

(4) language requirements for foreign students

TOEFL (Test of English as a Foreign Language): minimum score of 213 for the computer-based test CBT.

TOEFL Internet Based Test (IBT) subtest target scores: writing 25, speaking 24, reading 21, and listening 15. The minimum composite score is 85. First provision, if any subtest score is below the target, but the composite total is 82 or above, the department will consult with ESL. Second provision, if one or more subtest score is below target and the composite is below 82, the student must attend the step-up program and the department will consult with ESL.

Resetting the scores to appropriate levels will be done in conjunction with ESL.

(5) application process for interdisciplinary programs

The proposed programs are currently not interdisciplinary programs. However, it is the long-term intent to develop these programs to become interdisciplinary. At such time to be considered for admission, applicants for the masters and doctoral program must submit:

- a) A completed application and non-refundable application fee
- b) GRE scores
- c) At least two (2) letters of recommendation from qualified individuals to evaluate the applicant's academic achievement and potential for graduate studies
- d) Official transcripts from all colleges/universities attended
- e) A personal essay summarizing their career objectives and work experience with respect to the chosen field of study

(6) admission deadline

The deadline for fall semester applications is July 15. The spring semester deadline is December 1. The deadline for financial aid for the next academic year is January 15.

B. Specific degree requirements

Master's Degree

(1) New and/or existing course/credit requirements (attach new course proposal for each new graduate course)

Course Requirements

- a) Minimum of 30 semester credits, at least 18 in the major field.
- b) Minimum of 24 credits in courses numbered 300 or higher.
- c) Minimum of 18 credits in courses numbered 400 or higher, at least 15 in the major field.
- d) All courses in the graduate degree program must have 200 or higher numbers.
- e) All CEE courses in the program must be numbered 300 or higher.
- f) A degree program, listing all courses to be completed for the master's degree, must be signed by the CEE Director for Graduate Studies and Research and submitted to the Associate Dean's Office for approval by the University Graduate and Research Committee. Submission should be as soon as possible after the completion of 15 credits towards the degree.

Core Course Requirements

- a) **Major Area Requirements:**
CEE 352 (Structural Dynamics), CEE 366 (Finite Element Method in Structural Engineering), CEE 413 (Mechanics and Behavior of Structural Members) and CEE 450 (Advanced Structural Analysis). These are existing courses in the Lehigh University Catalog.
- b) **Exemptions:** Exemptions from core course requirements listed above are granted based on either examination or concurrent recommendation by the student's academic advisor and the course instructor.

(2) Thesis requirement

The normal effort of the thesis and special problems courses CEE 491 or 481 is 3 credits. A student should not mix credits of these three courses. It is expected that a student's effort for these credits will be somewhat more than that for a regular 3 credit course which requires approximately 130-160 hours. More than three credits may be proportionally assigned for more extensive work in the judgment of the supervisor. The two options available for master's students are:

a. Master of Science - Thesis Option (CEE 491)

This is a research-oriented option, expected of all research assistants, and may also be selected by other graduate students. The thesis should reflect a study of a civil engineering problem with an existing solution and be technically suitable for publication in a refereed technical journal. The writing should conform to the specifications of the graduate school. A copy should be filed in the Fritz Engineering Laboratory Library.

b. Master of Science - Special Problems Option (CEE 481)

The intensive study (project) is a more flexible option than a thesis, and may be research, analytical, or design oriented. The project should involve a significant effort of independent work including literature search, engineering analysis, synthesis of information, and engineering judgment. The project report should be of a quality and style suitable for publication in a refereed technical journal or in a professional magazine or presentation at a technical conference.

(3) Comprehensive examination requirement

There is no comprehensive exam requirement at the Master's level. However, all Master's degree candidates are required to make a presentation of his or her work at a CEE/FERS (Fritz Engineering Research Society) seminar before receiving the degree. The presentation is to be made during the last semester before graduation. The schedule of seminars will be arranged by the FERS seminar chairperson, who will handle the physical arrangement of each presentation in consultation with the CEE Seminar Committee chairperson.

M.S. Candidates: Presentation will be on the intended thesis (CEE 491), special problems (CEE 481) or independent research work (CEE 429, CEE 439, CEE 449, CEE 469, or CEE 479).

Doctoral Degree

(1) language requirement

There is no foreign language requirement.

(2) Qualifying and/or general examination requirements (if both required, describe each below)

Qualifying Examination (See Attachment A)

- a) Lehigh Master's students continuing for Ph.D. are required to take it at the end of the semester after completion of the master's degree.
- b) All others must take it at the end of the first semester of graduate study.
- c) If unsuccessful, a second examination one semester later may be granted upon petition. A third attempt is not allowed.

General Examination (See Attachment B)

Taken prior to end of fifth semester.

- b) Must be passed at least seven months before graduation.

If unsuccessful, a second attempt may be granted, scheduled at least 5 months after the first one.

(3) Course/credit requirements (attach new course proposal for each new graduate course)

Credit Requirements:

- a) There is no specified minimum requirement for courses. However most Ph.D. programs include 20 to 30 credits of course work beyond the master's degree.
- b) The total number of (tuition) credits, including dissertation research, should be at least 72 beyond the bachelor's degree. If the Master's degree is from another university a minimum of 48 (tuition) credits is required at Lehigh

(4) Master's degree requirements (if student fails to complete doctorate)

Students who fail to pass the Qualifying Exam or who choose to discontinue graduate study prior to completing all the requirements of the Ph.D. degree may apply for an MS degree provided they have completed 30 hours (minimum) of coursework from approved categories in the Ph.D. curriculum

Please refer to section 3 B (1) and 3 B (2) for Master's degree requirements.

(5) Faculty available to direct dissertations

Seven faculty members in CEE are currently available to direct dissertations. Dr. Clay Naito (Assistant Prof.), Peter Mueller (Associate Prof.), Stephen Pessiki (Full Prof.), James Ricles (Full Prof.), Richard Sause (Full Prof.), John Wilson (Full Prof.), and Yunfeng Zhang (Assistant Prof.). The department also intends to have a new professor in the Fazlur Rahman Khan Chair commencing fall 2006

(6) Expected time to complete the degree

- a) A resident student is expected to complete the doctoral degree in three to four years after earning the Master's degree.
- b) Maximum time limit is ten years for all work past bachelor's degree, or seven years for doctoral program if there is a break of at least one semester after the completion of master's degree

C. Details of the Proposed Program (any information not supplied elsewhere on this form but important to the consideration of the proposed program)

Milestones: Time Sequence and Procedure

The box below summarizes the time requirements that are subsequently provided in more detail as adopted by the CEE faculty on March 17, 1999 for the Ph.D. in Civil Engineering. The student's Background Information Form (Attachment C) should be updated and submitted to the Director of Graduate Studies and Research of the CEE Department before each exam

The same requirements are to be met for the proposed Ph.D. program

1. **Qualifying Exam:** Take at end of the first semester of graduate study[#]
 2. **Dissertation Supervisor:** Identified prior to the end of the second semester
 3. **Committee:** Form prior to the end of the third semester
 4. **PhD Proposal & Admission to Candidacy:** Submit prior to the end of the third semester^{**}
 5. **General Exam:** Take prior to the end of the fifth semester^{**}
 6. **Dissertation Draft:** Submit 2 weeks before Dissertation Defense; see University requirements
 7. **Dissertation Defense and Final Examination:** See University requirements
 8. **Submission of Completed Dissertation and Application for Degree:** See University requirements
- # Or at the end of the semester after completion of Lehigh CEE M.S. degree. Must petition to try a second time
- ** Not less than 12 months before graduation; includes Course Program & Dissertation Topic
- ** At least 7 months before graduation

Performance Requirement:

- a) Courses with grades below C are not allowed in graduate degree programs.
- b) More than four grades below B in entire Lehigh graduate career (regardless of number of credits) will terminate student's eligibility for continued graduate work at Lehigh

Residence Requirement:

Either two semesters of full time graduate study or 24 credits of graduate study within a 12-month period

D. Implementation Plan (how the degree will be put into place, including initial admissions)

These graduate structural engineering degree programs would begin to be advertised upon approval, and its first students are anticipated to be admitted in the fall 2006. The faculty, courses, laboratory space and other resources are in place to implement the Master's and Ph.D. Programs commencing fall 2006.

4. Academic Impact

A. Is the proposed new program interdisciplinary?

That is the long-term intent. For now, however, it only involves the Master's and Ph.D. degrees in the same general discipline (Civil and Environmental Engineering). We propose that the program would expand as collaborative relationships across departments and colleges continue to mature. At that point, it would become interdisciplinary.

B. Identify any known effects of the proposed new program on other programs at the University.

There are no known additional effects on other programs at Lehigh. The students enrolled in these programs will be eligible to take courses consistent with the degree requirements and Lehigh University requirements. When additional tracks will be developed, faculty from several departments across RCEAS and the CBE, as appropriate, will be consulted to provide input, advice and participation at various levels (from simply allowing students to take their courses to serving as members of doctoral committees, to ultimately formulating additional tracks). No other departments, however, are ready to propose other tracks at this time. When proposed, they will comply with university approval procedures (including completion and submittal of appropriate GRC forms).

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new program and the following information provided:

(1) Who was consulted?

No known effects

(2) Is the proposed new program acceptable to all other programs affected?

Yes

(3) Will any changes be required in the affected programs? If so, please describe below:

No.

D. Does the proposed new program affect the University's commitment to diversity in any way? If so, please describe below:

No

5. Resource impact

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

These degree programs are not expected to increase demand on library resources beyond our normal capacity

(2) **Computer impact statement** (attach statement if provided by LTS)

These degree programs are not expected to increase demand on library resources beyond our normal capacity.

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

The CEE faculty has been covering all the courses in structural engineering as part of handling the master's and doctoral courses for the proposed programs. (See Attachment D)

To complement existing faculty efforts, a new faculty position the Fazlur Rahman Khan Chair, has been funded and a search is underway for an August 2006 hire. This person will have research, teaching and advising responsibilities in the proposed new programs.

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

This program is not expected to place demands that are not met by existing facilities

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

The program faculty will pursue outside funding to support fulltime graduate students and enhance graduate research and education facilities.

REGULATIONS REGARDING THE Ph.D. QUALIFYING EXAMINATION

Prior to submission to the Graduate School of an *Application for Admission to Candidacy for the Doctorate*, each prospective doctoral candidate must pass a Ph.D. qualifying examination administered by the Department of Civil and Environmental Engineering

A. OBJECTIVE OF EXAMINATION: The objective of the Ph.D. Qualifying Examination is to establish whether or not a candidate has sufficient intellectual ability, strong motivation, and an adequate understanding of the fundamentals of Civil Engineering to have a reasonable chance of successfully completing the requirements of the Ph.D. program

B. TIME OF EXAMINATION: The examination will be held twice a year, at the end of each semester. The candidate must take the examination at the first offering upon attainment of the Master's degree or if the Master's degree is from another university at the end of his/her first semester in residence at Lehigh

C. THE QUALIFYING EXAMINATION COMMITTEE: The examination will be administered by the Qualifying Examination Committee in the candidate's major field of study. At the present time, the available major fields are Environmental Engineering, Geotechnical Engineering, Hydraulic Engineering and Structural Engineering.

D. WRITTEN EXAMINATION: *Each candidate must exhibit an advanced understanding (equivalent to a master's degree) of his/her intended major field of study. The written examination will be four to eight hours in duration. Additional details are determined by the structural engineering qualifying examination committee as follows.*

The written examination will be given in two three-hour parts on consecutive days. Both parts will be closed book. The first part will consist of six to eight short questions all of which must be answered. The second part will have four to five in-depth questions three to four of which are to be answered

E. ORAL EXAMINATION: Each candidate will be orally examined by the respective qualifying examination committee. The oral examination is open to all departmental faculty members. Questions are not necessarily restricted to the major area. The duration of the oral examination will not be more than 1½ hours

F. EXAMINATION PROCEDURE:

1. The written examination will be given first. The oral examination will be scheduled as soon as possible after completion of the written examination normally within a week
2. Prospective candidates must take both the written examination and the oral examination at the same offering of the Ph.D. Qualifying Examination
3. The performance of each candidate will be judged by the Qualifying Examination Committee in the candidate's major area. The decision to pass or fail will be based on the results of the Qualifying Examination as well as on the candidate's total engineering experience up to the Qualifying Examination.
4. The result of the Qualifying Examination will be one of the following:
 - a) **PASS**
 - b) **PASS CONDITIONALLY** with specific requirement(s). These condition(s) must be removed before the applicant is considered to have passed the Qualifying Examination
 - c) **FAIL**
5. Each candidate will be informed of faculty's decision in writing by the Chairman of the Department
6. A candidate who fails the qualifying examination may petition for a second examination, but it must be taken at the next scheduled offering. The result of the second examination will be either PASS or FAIL (no PASS CONDITIONALLY).
7. A third examination is not permitted. Those who do not pass the qualifying examination second time are no longer considered to be pursuing a Ph.D. degree and are encouraged to arrange to earn a terminal M.S. degree

Attachment B

A. OBJECTIVE: In conformity with the University regulations stated in the Catalog the Ph.D.

The General Examination serves to establish whether or not a particular candidate possesses adequate *capacity and proficiency* in his field of study to be acceptable to the Department. In particular, the examination provides an opportunity for those faculty members not well acquainted with the candidate to satisfy themselves of his/her competence, and allows the faculty to establish a concrete quantitative and comparative estimate of the candidate's ability.

Specific qualities to be tested are as follows:

- 1) Familiarity with up-to-date factual knowledge in the candidate's field.
- 2) Analytical ability to work within the scope of available information and to advance into new areas
- 3) Familiarity with reference material and ability to use it
- 4) Ability to defend ideas in front of a group

B. TIME: The general examination should be taken upon an essential completion of all coursework in the candidate's program and before the candidate gets deeply into his/her dissertation. It should preferably be taken at least one year before the candidate's prospective date of graduation, and it must be passed at least seven months before the degree may be awarded. The specific time is arranged by the Special Committee and the candidate.

C. THE EXAMINATION: The general examination shall consist of a written part and an oral part.

- 1 **Open Book Written Examination:** The written examination will normally be five calendar days long. It will consist of between four and six problems designed to test qualities (1), (2), and (3). Problems may or may not have specific solutions. The problems may require extension of a candidate's knowledge. At least one problem should test the candidate's ability to do independent research
- 2 **Oral Examination:** The oral examination will be given within one to three weeks after the written examination, and it will stress quality (4). The questioning period will be normally of not more than one and one-half hours' duration. The examiners will consist of the faculty of the Department of Civil and Environmental Engineering and the candidate's Special Committee. The faculty may on occasion invite the participation of faculty members from outside of the Department

D. EVALUATION: Immediately following the oral examination, the candidate's Special Committee, with the advisement of all other faculty members, will evaluate the candidate's performance in the general examination. Normally the outcome of the examination will be "Pass" or "Fail". However, in the exceptional case when a clear-cut decision cannot be agreed upon, the Special Committee has the right to "Continue" the examination. Then, the candidate will be required to take an additional examination (written and/or oral). This "Continuation" part of the general examination will be conducted in about three months and may be of a smaller scope than the original examination

E. NOTIFICATION: The chairman of the Special Committee will inform the candidate of the decision as soon as feasible. Should the candidate fail he/she is permitted to make a second attempt not sooner than five months after the first examination.

Background Information Form for Qualifying Exam

Name:

Date:

Major Area:

- 1 Non-Academic Professional Experience (Industrial consulting contracting military)

- 2 Academic Background (B.S. and Graduate Work before Lehigh){Years University Degrees}

- 3 Graduate work at Lehigh (group courses after M.S. separately){Courses Instructor's Name Grades e.g. CE.413 (Wilson)}

- 4 Ph.D. Objectives

5. Evaluation by Academic Advisor or Tentative Dissertation Supervisor

- 6 Qualifying Examination Date:

Written: Oral:

Decision:

- 7 Tentative Committee:
 - 1) _____ (Chairman)
 - 2) _____ (Supervisor)

CEE 300 and 400 Level Structural Engineering Courses

	(Does not include Geotechnical, Mechanics or Materials Science Courses)
CEE 352	Structural Dynamics
CEE 360	Structural Engineering Project
CEE 361	Bridge Systems Design
CEE 363	Building Systems Design
CEE 365	Prestressed Concrete
CEE 366	Finite Element Method in Structural Engineering
CEE 381	Special Topics
CEE 405	Analytical and Numerical Methods
CEE 408	Computer Methods in Civil Engineering
CEE 409	Finite Element Method in Structural Mechanics
CEE 412	Methodologies of Structural Design
CEE 413	Mechanics and Behavior of Structural Members
CEE 414	Analysis and Design of Steel and Composite Structural Members
CEE 415	Analysis and Design of Ductile Steel Structural Systems
CEE 450	Advanced Structural Analysis I
CEE 451	Advanced Structural Theory
CEE 452	Fatigue & Fracture of Structures - An Interdisciplinary View
CEE 454	Plate and Shell Structures
CEE 455	Advanced Structural Dynamics
CEE 456	Behavior and Design of Earthquake Resistant Structures
CEE 457	Theory and Design of Steel Structures
CEE 458	Repair and Retrofit of Steel Structures
CEE 459	Advanced Topics in Plastic Theory
CEE 460	Experimental Methods in Structural Engineering
CEE 461	Advanced Bridge Engineering
CEE 462	Stability of Structural Systems
CEE 463	Advanced Mechanics of Reinforced Concrete
CEE 464	Analysis of Plates and Shells
CEE 466	Concrete Shell Structures
CEE 467-25	Metal Structures Technology
CEE 467-40	Nonlinear Analysis of Structural Components and Systems
CEE 467-41	Smart Structural Systems
CEE 467-42	Structural Reliability
CEE 467-43	Repair and Retrofit of Reinforced Concrete Structures
CEE 468	Stability of Elastic Structures
CEE 469	Structural Research
CEE 381	Special Topics
CEE 385	Research Procedures Seminar
CEE 480	Civil Engineering Project
CEE 481	Special Problems
CEE 483	Graduate Seminar
CEE 491	Thesis
CEE 499	Dissertation

Graduate Course List November 2005

ADD four courses at the graduate level:

CSE 408

CSE 426

CSE 431

CSE 448

RCEAS: CSE Department

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

CSE 408 Bioinformatics: Issues and Algorithms (3)

Computational problems and their associated algorithms arising from the creation, analysis, and management of bioinformatics data. Genetic sequence comparison and alignment, physical mapping, genome sequencing and assembly, clustering of DNA microarray results in gene expression studies, computation of genomic rearrangements and evolutionary trees. This course, a version of 308 for graduate students requires advanced assignments. Credit will not be given for both CSE 308 and CSE 408. No prior background in biology is assumed.

Prerequisites: CSE 340 or IE 170 or permission of the instructor.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture/seminar, three hours/week.

3. Rationale for proposed new course:

As demonstrated by enrollment in experimental versions of this course in Spring 2004 and Spring 2005, there is strong demand for a course in this area.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No.

B. Identify any known effects of the proposed new course on other programs at the University.

None.

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

5. Resource Impact

A. Provide impact statements in the four areas listed below:

(1) Library impact statement (attach statement if provided by LIS)

None expected.

(2) Computer impact statement (attach statement if provided by LIS)

None expected.

(3) Faculty impact statement (how proposed course affects load on existing faculty or requires new faculty)

None expected.

(4) Facilities impact statement (how proposed course affects load on existing facilities or requires new facilities)

None expected.

B Provide a statement indicating who will assume financial responsibility for any new resources required:

None expected.

RCEAS: CSE Department
Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

CSE 426 Pattern Recognition (3)

Bayesian decision theory and the design of parametric and nonparametric classifiers: linear (perceptrons), quadratic, nearest-neighbors, neural nets. Machine learning techniques: boosting, bagging. High-performance machine vision systems: segmentation, contextual analysis, adaptation. Students carry out projects, e.g. on digital libraries and vision-based Turing tests. This course, a version of 328 for graduate students requires advanced assignments. Credit will not be given for both CSE 326 and CSE 426. Prerequisites: CSE 109, CSE 340, Math 205, Math 231, or consent of Instructor.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

lecture / seminar, 3 hours per week

3. Rationale for proposed new course:

This course has been taught twice before as an experimental course by Dr. Baird, who specializes in this area. It very much strengthens the department's offerings in pattern recognition.

4. Academic impact on programs affected by new course:

This will benefit the graduate programs in CS and CompE by diversifying the elective courses.

A. Is the proposed course to be cross-listed?

no

B. Identify any known effects of the proposed new course on other programs at the University.

None

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

No

5. Resource Impact

None

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

None

(2) **Computer impact statement** (attach statement if provided by LTS)

None

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

Experimental versions of this course have been taught by Dr. Henry Baird, a new faculty member with expertise in this area

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

None

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

None required

**RCEAS: CSE Department
Proposed New Course**

1. Proposed new course number and course description (as it will appear in course catalogue):

CSE 431. Intelligent Agents (3)
Principles of rational autonomous software systems. Agent theory; agent architectures, including logic-based, utility-based, practical reasoning, and reactive; multiagent systems; communication languages; coordination methods including negotiation and distributed problem solving; applications. Prerequisite: CSE 327 or equivalent.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

lecture / seminar, 3 hours per week

3. Rationale for proposed new course:

This course is an advanced artificial intelligence (AI) course which builds on CSE 327, the intro to AI course offered at Lehigh. Since work on intelligent agents is all about building complete intelligent systems, it integrates many of the subfields of AI. Similar courses are offered at many leading universities, including MIT and CMU. The course has been offered at Lehigh twice (in an experimental version). In both cases, the students believed that the course should be made a regular offering by Lehigh.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

no.

B. Identify any known effects of the proposed new course on other programs at the University.

yes

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so please describe below:

NO

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

No

5. Resource Impact

None

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

none

(2) **Computer impact statement** (attach statement if provided by LTS)

none

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

Professor Helflin will teach the course as part of his regular course load

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

None

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

None required

RCEAS: CSE Department
Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

CSE 448 AI Game Programming (3)

Contemporary computer games: techniques for implementing the program controlling the computer opponent; using Artificial Intelligence in contemporary computer games to enhance the gaming experience; pathfinding and navigation systems; group movement and tactics; adaptive games, game genres, machine scripting language for game designers, and player modeling. This course, a version of 348 for graduate students requires advanced assignments. Credit will not be given for both CSE 348 and CSE 448.

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study or other) and number of contact hours per week:

lectures, 3 hours per week

3. Rationale for proposed new course:

According to several media sources including the San Francisco Chronicle edition of Saturday, December 18, 2004, the computer game industry is a bigger industry than the Hollywood (movie making) industry. Programming the "AI" (roughly, the program controlling the computer opponent) of games is a crucial technology for computer games. In fact, one third of the annual Game Developers Conference (GDC) the leading meeting of game developers, is devoted to "AI" topics. In this course, we will look at contemporary computer games, explore techniques for implementing the "AI" (from the perspective of the game industry) and study opportunities to use AI (from the research perspective) to enhance the gaming experience.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

no.

B. Identify any known effects of the proposed new course on other programs at the University.

none

C. If there are known effects, individuals in charge of the affected programs must be consulted about the proposed new course and the following information provided:

(1) Who was consulted?

(2) Is the proposed new course acceptable to all other programs affected?

(3) Will any changes be required in the affected programs? If so, please describe below:

D. Does the proposed new course affect the University's commitment to diversity in any way? If so, please describe below:

No

5. Resource Impact

None

A. Provide impact statements in the four areas listed below:

(1) **Library impact statement** (attach statement if provided by LTS)

none

(2) **Computer impact statement** (attach statement if provided by LTS)

none

(3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)

Professor Munoz-Avila will teach the course as part of his regular course load

(4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)

None

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

None required

Electrical and Computer Engineering

Proposed New Course for APC

1. Proposed new course number and course description (as is it will appear in course catalog):

ECE 4xx Introduction to Cryptography and Network Security (3)

Introduction to cryptography, classical cipher systems, cryptanalysis, perfect secrecy and the one time pad, DES and AES, public key cryptography covering systems based on discrete logarithms, the RSA and the knapsack systems, and various applications of cryptography. This graduate version of ECE3xx requires additional work. May not be taken with ECE3xx for credit. Prerequisite: Graduate student status.

2. Instructional mode (i.e., lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week:

Lecture

3 hours/week

3. Rationale for proposed new course:

The need for data secrecy has been accelerated by the Internet and wireless communications. This course has been taught more than once in the past and there has been significant interest.

4. Academic impact on programs affected by new course:

Is this proposed new course cross-listed? No

Is the proposed new course acceptable to all affected programs? Yes

If there are known effects, individuals in charge of the affected programs must be consulted about the changes and the following information provided: The course will attract students from electrical engineering, computer engineering, and computer science programs. Professor Mooi Choo Chuah in the Department of Computer Science and Engineering offers a course in network security. The proposed courses may become a prerequisite course for Professor Chuah's course.

Who was consulted? Professor Mooi Choo Chuah.

Is the proposed new course acceptable to the affected program? Yes.

Will any changes be required in the affected programs? No.

Identify any known effects of the proposed new course on the University's commitment to diversity. There are no known effects on the University's commitment to diversity.

5. Resource Impact Statement:

Provide each of the following:

Library impact statement: None

Computer impact statement: None

Faculty impact statement: Dr. Zhiyuan Yan will teach this course. It will have a positive impact on his teaching.

Facilities impact statement: None

Provide a statement indicating who will assume financial responsibility for any new resources required: N/A

Engineering: Electrical and Computer Engineering

Proposed Course Changes

1. Current course number, title, course description, and credits (from present course catalogue):

ECE 473 Optical Communications Laboratory (2)

Fundamental optical instrumentation used for test and measurement in optical communications. The theoretical principles of operation of the instruments and the significance of the parameters measured in optical communications will be covered. Fields of measurement include: optical power, optical spectrum analysis, wavelength measurement, laser diode characterization, polarization analysis, modulation analysis, insertion loss measurements, optical reflectometry for component characterization, optical time domain reflectometry and backscatter measurements, dispersion measurement, and characterization of fiber amplifiers. Prerequisite: ECE 347 or ECE 348 or ECE 371 or ECE 372, or equivalent.

2. Proposed course number, title, course description, and credits (as it will appear in course catalogue):

3. Nature of proposed change(s)

- A. Course title change? If so, provide rationale below:
- B. Course number change? If so, provide rationale below:
- C. Change in course credits? If so provide rationale below:
- D. Change in course description? If so, provide rationale below:
- E. Other change(s)? If so, please describe below and provide rationale for each change.

Delete course The laboratory space no longer exists.

4. Resource Impact

A. Provide impact statements in the four areas listed below:

- (1) Library impact statement (attach statement if provided by LTS)
- (2) Computer impact statement (attach statement if provided by LTS)
- (3) Faculty impact statement (how proposed program affects load on existing faculty or requires new faculty)
- (4) Facilities impact statement (how proposed program affects load on existing facilities or requires new facilities)

B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Proposed Program Changes for APC

Name and summary of current program:

The goal of the M.S. in Information and Systems Engineering (I&SE) program is to provide advanced educational and research opportunities related to operations research, quantitative and computational analysis, large scale optimization, system simulation, information-centric systems, and the integration of information systems in industrial, service and financial organizations. The program will emphasize three core areas: (1) Information Economics, (2) Quantitative Systems Analysis, and (3) Information Technology. Graduates of the program will be operations research analysts, systems engineers and information technology specialists who are employed by virtually all organizations, especially in consulting, multi-national operations, transportation, logistics, financial institutions, and telecommunications.

Core Courses (Three courses required of all I&SE students):

IE 341 Data Communication Systems Analysis and Design (3)
IE 362 Logistics and Supply Chain Management (3)
IE 426 Optimization Models and Applications (3)

Proposed program changes (as they will appear in the catalog):

Core Courses (Three courses required of all I&SE students):

IE 362 Logistics and Supply Chain Management (3)
IE 404 Simulation
IE 426 Optimization Models and Applications (3)

Description of proposed change(s):

Change the core course IE 341 to IE 404

Rationale for proposed change(s):

IE 341 Data Communications Analysis and Design does not provide tools that are needed in follow on courses in the degree program. IE 404 Simulation will provide students with tools that can be applied in follow on courses

Academic Impact Statement:

Is this proposed program change interdisciplinary? No

Identify any known effects of the proposed program change on other programs at the University.

None

If there are known effects, individuals in charge of the affected programs must be consulted about the proposed program change and the following information provided:

Who was consulted?

Is the proposed program change acceptable to the affected programs?

Will any changes be required in the affected programs? If so, describe.

Identify any known effects of the proposed program change on the University's commitment to diversity.

None identified

Resource Impact Statement:

Provide each of the following:

Library impact statement No impact on Library services

Computer impact statement No impact on computing services

Faculty impact statement Existing sections of IE 341 will be taught less frequently, which will free faculty time for other courses.

Facilities impact statement No impact to facilities

Provide a statement indicating who will assume financial responsibility for any new resources required:

ISE department will assume financial responsibility for new resources that are required.

RCEAS: MEM

Proposed New Course

1. Proposed new course number and course description (as it will appear in course catalogue):

Mech 4xx - Introduction to Solid Mechanics (3)

An introductory graduate course in the mechanics of solids. Topics to be addressed include: tensor analysis, analysis of strain and nonlinear kinematics, stress, work conjugate stress-strain measures, conservation laws and energy theorems, Hamilton's principle, variational calculus, isotropic and anisotropic linear elasticity, boundary value problems, solutions using various potentials, wave propagation, simple beam and plate theories and associated buckling problems. Prerequisite: Math 205 or equivalent

Lecture, three hours per week

2. Instructional mode (lecture, recitation, laboratory, seminar, independent study, or other) and number of contact hours per week

3. Rationale for proposed new course:

The current introductory class in this topic is Mech 408, Introduction to Elasticity, which will be superseded by the proposed course. Elasticity, the topic of Mech 408, is still the most important element of present engineering design and analyses. However modern computers and numerical techniques, such as the Finite Element method, have advanced to such a degree that classic elasticity presently has little use in engineering. On the other hand, computational methods have made other areas, such as large deformation analyses, more practical and substantially more common in engineering design than just a few years ago. The proposed course will bring an infusion of more modern material into the introductory curriculum, while retaining those topics from the previous course that remain relevant.

4. Academic impact on programs affected by new course:

A. Is the proposed course to be cross-listed?

No.

B. Identify any know effects of the proposed new course on other programs at the University.

None.

C. Does the proposed new course affect the University's commitment to diversity in any way?

No.

5. Resource Impacts

A. Provide impact statements in the four areas listed below:

1. Library impact statement.

None.

2. **Computer impact statement**

None.

3. **Faculty impact statement.**

Because this course will replace an existing course, the net effect on faculty resources is nil.

4. **Facilities impact statement**

None

B. **Provide a statement indicating who will assume financial responsibility for any new resources required.**

Department of Mechanical Engineering & Mechanics.

Engineering: Mechanical Engineering

Proposed Course Changes

1. Current course number, title, course description and credits (from present course catalogue):

ME 427. (ChE 427) Multiphase Flow and Heat Transfer (3)

Heat transfer and fluid dynamics of multiphase systems. Subcooled, nucleate, and film boiling; bubble nucleation; dynamics of bubble growth and collapse; vapor-liquid cocurrent flow regimes; two-phase pressure drop and momentum exchange, low instabilities; convective-flow boiling; simultaneous heat and mass transfer. Prerequisite: CHE 421 or ME 321, or courses in the area of transport phenomena. Chen

2. Proposed course number, title, course description, and credits (as it will appear in course catalogue):

3 Nature of proposed change(s)

- A. Course title change? If so, provide rationale below:
- B. Course number change? If so provide rationale below:
- C. Change in course credits? If so, provide rationale below:
- D. Change in course description? If so, provide rationale below:
- E. Other change(s)? If so, please describe below and provide rationale for each change.

Delete course. Neither department (ChemE or ME) plans to offer the course again.

4. Resource Impact

- A. Provide impact statements in the four areas listed below:
 - (1) **Library impact statement** (attach statement if provided by LTS)
 - (2) **Computer impact statement** (attach statement, if provided by LTS)
 - (3) **Faculty impact statement** (how proposed program affects load on existing faculty or requires new faculty)
 - (4) **Facilities impact statement** (how proposed program affects load on existing facilities or requires new facilities)
- B. Provide a statement indicating who will assume financial responsibility for any new resources required:

Today at Ed Pol we passed a motion to allow all Engineering degree programs (except ChE) to drop 1 credit hour from their programs.