Office of the Registrar
FORM 40G REV. 12/09

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

58-07

DEPARTMENT ENE EFFECTIVE SESSION Fall 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [x] 6. Change in course credit/type
- [x] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation		Subject Abbreviation	Hist and Phil of Eng Ed
Course Number		Course Number	ENE 50200
Long Title	History and Philosophy of Engineering Education		
Short Title	Hist & Phil Engineering Education		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED (Check All That Apply)
- [ ] Summer [x] Fall [ ] Spring

CAMPUS(ES) INVOLVED
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range: Minimum Cr. Hrs ____ (Check One) To [ ] Or [ ] Maximum Cr. Hrs ____
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only Remove [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
   Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6. Registration Approval Type: Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Remove Pass/Not Pass only. (Course should be graded - this was an error in the earlier document)

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Undergrad Curriculm Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	X R. Cipra Undergrad Curriculm Committee	4/27/10 Date
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate Council	
West Lafayette Department Head	3/29/10 Date	West Lafayette College/School Dean	5/10/10 Date	Graduate Council Secretary	5/25/10 Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	6/4/10 Date

OFFICE OF THE REGISTRAR

(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)

3/10

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Office of the Registrar
FORM 40G REV. 12/09

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

ENE 58-01

DEPARTMENT ENE EFFECTIVE SESSION Fall 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [x] 6. Change in course credit/type
- [x] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation		Subject Abbreviation	Hist and Phil of Eng Ed
Course Number		Course Number	ENE 50200
Long Title	~~History and Philosophy of Engineering Education~~		
Short Title	Hist & Phil Engineering Education		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
☐ Summer ☑ Fall ☐ Spring

CAMPUS(ES) INVOLVED
☐ Calumet ☐ N. Central
☐ Cont Ed ☐ Tech Statewide
☐ Ft. Wayne ☑ W. Lafayette
☐ Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To ☐ Or ☐
Maximum Cr. Hrs
3. Equivalent Credit: Yes ☐ No ☐
4. Thesis Credit: Yes ☐ No ☐

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only Remove	☐	6. Registration Approval Type	
2. Satisfactory/Unsatisfactory Only	☐	Department ☐	Instructor ☐
3. Repeatable	☐	7. Variable Title	☐
Maximum Repeatable Credit:	☐	8. Honors	☐
4. Credit by Examination	☐	9. Full Time Privilege	☐
5. Special Fees	☐	10. Off Campus Experience	☐

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Remove Pass/Not Pass only. (Course should be graded - this was an error in the earlier document)

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Undergrad Curriculm Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
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North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate Council	
3/29/10 West Lafayette Department Head	Date	5/10/10 West Lafayette College/School Dean	Date	Graduate Council Secretary	5/26/10 Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	6/4/10 Date

OFFICE OF THE REGISTRAR

(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)

3110

Office of the Registrar
FORM 40G REV. 12/09

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

58-07

DEPARTMENT ENE EFFECTIVE SESSION Fall 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [x] 6. Change in course credit/type
- [ ] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation		Subject Abbreviation	Hist and Phil of Eng Ed
Course Number		Course Number	ENE 50200
Long Title	History and Philosophy of Engineering Education		
Short Title	Hist & Phil Engineering Education		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
- [ ] Summer
- [x] Fall
- [ ] Spring

CAMPUS(ES) INVOLVED
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.0
2. Variable Credit Range:
   Minimum Cr. Hrs
   (Check One) To [ ] Or [ ]
   Maximum Cr. Hrs
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
   Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6. Registration Approval Type
   Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

sent 5/10/10
M. Geist
yours

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
Remove Pass/Not Pass only. (Course should be graded - this was an error in the earlier documer

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Undergrad Curriculm Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	X R. Cipra Undergrad Curriculm Committee	4/27/10 Date
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate Council	
3/29/10 West Lafayette Department Head	Date	5/10/10 West Lafayette College/School Dean	Date	Graduate Council Secretary	Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)

Higgins, Linda L

From: Hays, Cindey A
Sent: Tuesday, March 30, 2010 8:28 AM
To: Higgins, Linda L
Subject: FW: ENE 50200
Attachments: ENE502rev-grade-3-29-10.xls; ENE501rev-grade-3-29-10.xls

Linda,
I have put the signed copies in a campus envelop and mailed to you for dean signature.
Thanks,
Cindey

From: Adams, Robin S.
Sent: Monday, March 29, 2010 12:00 PM
To: Davis, Robert; Radcliffe, David F
Cc: Hays, Cindey A
Subject: RE: ENE 50200

I did the Form 40G for both – assuming both change to a grade option – I've printed them out and attached them here

David – you need to sign them
Cindey – after David signs them can you get Audeen to sign them?

Thanks,
r

From: Davis, Robert
Sent: Monday, March 29, 2010 8:33 AM
To: Radcliffe, David F
Cc: Hays, Cindey A; Adams, Robin S.
Subject: FW: ENE 50200
Importance: High

David,

Here is the fix for changing 502 (and 501) to be graded courses. Please let me know if I can be of assistance.

Regards,

Bob

BOB DAVIS
Assistant Head
Engineering Education
1301 Neil Armstrong Hall of Engineering
Purdue University
765 494 3897
rndavis@purdue.edu

From: Geist, Marilyn D.
Sent: Friday, March 26, 2010 8:03 PM
To: Adams, Robin S.; Davis, Robert

Cc: Payne, Tina L
Subject: ENE 50200
Importance: High

Dr. Davis . . .

Attached is a copy of the approved document for ENE 50200. I have also attached the information from the Graduate Council Document when ENE 501 and 502 were approved on October 15, 2009. Both were approved as Pass/Not Pass. Should ENE 50100 be changed to a graded course, as well?

To make this change, please submit a Registrar's Office Form 40G for each course, if applicable (no supporting document needed). Include on the Form 40G, the name of the department, the existing course subject abbreviation and number, the effective session, and in the "Course Description Box" indicate "Remove Pass/Not Pass only." The form should be signed by the department head and the person who signs course documents for Engineering (Audeen Fentiman can perhaps sign) to speed up the process.

This will be an administrative change and can be approved very quickly in the Graduate School.

Please let me know if you have further questions.

Marilyn

Marilyn D. Geist
Administrative Assistant
Graduate School/Graduate Council
Purdue University
Young Hall, Room 160
155 S. Grant Street
West Lafayette, IN 47907-2114

Phone: 765-494-2601
E-Mail: mdgeist@purdue.edu

From: Robin Adams [mailto:rsadams@purdue.edu]
Sent: Friday, March 26, 2010 12:05 PM
To: Davis, Robert
Cc: Geist, Marilyn D.
Subject: Re: ENE 502

Yes - there must have been a typo that wasn't caught - the course was never intended to be P/NP and has never been taught in that mode

Thanks for your help in fixing this
r
On Mar 26, 2010, at 12:00 PM, Davis, Robert wrote:

Hi Marilyn,

We have a course, ENE 50200, which was recently granted it's permanent course number. Apparently there was an error in the Form 40 submitted that effectively changed the grading from letter grades to P/NP. Is there a way that we can get this changed quickly as students are now registering and this will signal to them that the course it not "important enough to grade"?

Please let me know what we must do.

Regards,

Bob

BOB DAVIS
Assistant Head
Engineering Education
1301 Neil Armstrong Hall of Engineering
Purdue University
765 494 3897
rndavis@purdue.edu

From: Mahlke, Jo A.
Sent: Friday, March 26, 2010 11:57 AM
To: Davis, Robert
Cc: Adams, Robin S.
Subject: RE: ENE 502

Hi Bob –

The form 40 for ENE 50200 was approved by the Graduate Council with a grade mode of Pass/No Pass Only. If this was checked in error, you might talk with Marilyn Geist in the Grad School to see if she would allow the change without doing another form 40. If she does not allow it, a form 40 will be required to change the grading mode to a regular grade option.

If you need this done quickly, I'm sure Marilyn will rush a form 40 through for you.

If you have any further questions, please let me know.

Thank you –

Jo

Jo Ann Mahlke
Records, Registration and Graduation Services
Course Catalog Specialist
Office of the Registrar
610 Purdue Mall, Room 45
West Lafayette IN 47906
Phone: 765-494-6308
Fax: 765-494-0570
E-mail: jamahlke@purdue.edu

From: Davis, Robert
Sent: Friday, March 26, 2010 11:43 AM
To: Mahlke, Jo A.
Cc: Adams, Robin S.
Subject: FW: ENE 502

Hi Jo,

What is the process for getting this changed? I believe the Form 40 was submitted for getting the permanent course number and that there was no intent to change the grading of the class.

Thanks,

Bob

BOB DAVIS
Assistant Head
Engineering Education
1301 Neil Armstrong Hall of Engineering
Purdue University
765 494 3897
rndavis@purdue.edu

From: Horan, Carol J.
Sent: Friday, March 26, 2010 11:32 AM
To: Davis, Robert
Cc: Mahlke, Jo A.
Subject: RE: ENE 502

Came in on the Form 40 that way, and that's how it is in the catalog. Check with Jo Mahlke for specifics on getting it changed – I believe you will need another form 40.

<image001.png>

Carol Horan
43902
choran@purdue.edu

From: Davis, Robert
Sent: Friday, March 26, 2010 11:25 AM
To: Horan, Carol J.
Subject: FW: ENE 502

Hi Carol,

Please see the messages below. I could not find where it indicates whether a course is graded or not – can you please tell me? Also, is this something that you have to change or can I?

If this student is correct, I am confused. This has never been anything other than a graded course – how did it get changed?

Thanks,

Bob

BOB DAVIS
Assistant Head
Engineering Education
1301 Neil Armstrong Hall of Engineering
Purdue University

765 494 3897
rndavis@purdue.edu

From: Robin Adams [mailto:rsadams@purdue.edu]
Sent: Friday, March 26, 2010 11:12 AM
To: Davis, Robert
Subject: Fwd: ENE 502

Hi Bob,

Apparently ENE 502 (for fall) is showing up as a no grade pass/no pass option. It's supposed to be a graded option. (see below)

Can you help me figure out what needs to be done to get this corrected?

thanks
r

Begin forwarded message:

From: "Goris, Tatiana V" <tgoris@purdue.edu>
Date: March 25, 2010 8:39:34 PM EDT
To: "Adams, Robin S." <rsadams@purdue.edu>
Subject: ENE 502

Dr. Adams,
I finally registered for your course ENE 502, Fall 2010, but a computer (through mypurdue.purdue.edu) still shows "no grade"- pass/no pass option. Check it please or, someone needs to fix it . It might be confusing for other students who would not consider to register for this course just because the computer shows pass/no pass.

Have a good day,

Tatiana Goris.

Office of the Registrar
FORM 40G REV. 7/08

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

EFD 58-07 re used

DEPARTMENT: Engineering Education | EFFECTIVE SESSION: 200910

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [x] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	ENE	Subject Abbreviation	
Course Number	502	Course Number	
Long Title	History and Philosophy of Engineering Education		
Short Title	Hist Phil ENE (Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY))		

TERMS OFFERED (Check All That Apply): [ ] Summer [x] Fall [ ] Spring

CAMPUS(ES) INVOLVED: [ ] Calumet [ ] N. Central [ ] Cont Ed [ ] Tech Statewide [ ] Ft. Wayne [x] W. Lafayette [ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range: Minimum Cr. Hrs ____ (Check One) To [ ] Or [ ] Maximum Cr. Hrs ____
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [x]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Special Fees [ ]
6. Registration Approval Type: Department [ ] Instructor [x]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3		
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Examines the history and philosophy of engineering education by 1) exploring the history of engineering education through archival research and historical documents (critical moments, tensions, issues), 2) investigating philosophies of education and the philosophies that have guided engineering as a profession, and 3) critiquing the evolution of engineering education, identifying alternative scenarios, and imagining a future role in engineering education. This course introduces students to the field of engineering education while broadening their views of the roles of interrelationships between teaching and research.

	Date	Calumet School Dean	Date	Calumet Undergrad Curriculm Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
				RJ Cipra	10/15/08
Indianapolis Department Head	Date	Indianapolis School Dean	Date	Undergrad Curriculm Committee	Date
North Central Department Head	Date	North Central Chancellor	Date	Date Approved by Graduate Council	
K. A. Hollingsworth	8/26/08				
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date	Graduate Council Secretary	Date
			10/27/2008		
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)

Engineering Faculty Document No. 58-07
January 23, 2008

To: The Faculty of the College of Engineering
From: Department of Engineering Education
Subject: New Graduate Course, ENE 502

The faculty of the Department of Engineering Education has approved the following new graduate ENE course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENE 502 **History and Philosophy of Engineering Education**

Sem. 1, Class 3, Cr. 3.

Prerequisite: Open to students in Engineering Education or by consent of instructor.

Course description:
This course examines the history and philosophy of engineering education by (1) exploring the history of engineering education through archival research and historical documents (critical moments, tensions, issues), (2) investigating philosophies of education and the philosophies that have guided engineering as a profession (this includes characterizations on the nature of engineering), and (3) critiquing the evolution of engineering education, identifying alternative scenarios, and imagining a future role in engineering education. Common threads for discussion and reflection include: what is engineering, what should be the purposes of engineering education, who gets to be an engineer, who gets to be involved in these decisions, and where and how are these decisions made?

Reasons: This is a required course for the graduate programs in the Department of Engineering Education (ENE). This new course will also be of interest to graduate students in other Departments, Schools, and Colleges with engineering education or related interests. The intent of the course is to introduce students to the field of engineering education while broadening their views of the roles of and interrelationships between teaching and research. Our thesis is that understanding engineering education from historical and philosophical perspectives will facilitate making sense of the present as well as improve skills for forecasting and designing future paths.

This course was previously offered as ENE 695M – History and Philosophy of Engineering Education in Fall 2007. Eight (8) students were enrolled in the class; 7 of these students were from the ENE program and one student was from the College of Education. Evaluation results indicate that the course exceeded student expectations, and that students valued the teaching styles, course activities, and pedagogical approaches.

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE
ECC Minutes #25
Date 5/9/08
Chairman ECC Michael Ostrowski

Kamyar Haghighi, Head
Engineering Education

Office of the Registrar
FORM 40G REV. 7/08

PURDUE UNIVERSITY

REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

Print Form

DEPARTMENT School of Engineering Education

EFFECTIVE SESSION Fall 2009

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [X] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
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- [ ] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:	EXISTING:
Subject Abbreviation: ENE	Subject Abbreviation:
Course Number: 502	Course Number:
Long Title: History and Philosophy of Engineering Education	
Short Title: HIST PHIL ENE	

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[ ] Summer [X] Fall [ ] Spring

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [X] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only	[X]	6. Registration Approval Type	
2. Satisfactory/Unsatisfactory Only	[ ]	Department	[ ]
3. Repeatable	[ ]	Instructor	[X]
Maximum Repeatable Credit:	[ ]	7. Variable Title	[ ]
4. Credit by Examination	[ ]	8. Honors	[ ]
5. Special Fees	[ ]	9. Full Time Privilege	[ ]
		10. Off Campus Experience	[ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3		
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Undergrad Curriculum Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	Undergrad Curriculum Committee	Date
North Central Department Head	Date	North Central Chancellor	Date	Date Approved by Graduate Council	
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date	Graduate Council Secretary	Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

Supporting Document for a New Graduate Course

To: Purdue University Graduate Council

From:
Faculty Member: Robin Adams and Alice Pawley
Department: School of Engineering Education
Campus: Purdue University, West Lafayette

Date:

Subject: Proposal for New Graduate Course-Documentation Required by the Graduate Council to Accompany Registrar's Form 40G

For Reviewer's comments only (Select One)

Reviewer:

Comments:

Contact for information if questions arise:
Name: Cindey Hays (Temporary)
Phone Number: 43884
E-mail: isenberg@purdue.edu
Campus Address: ARMS 1321

Course Subject Abbreviation and Number: ENE 502

Course Title: History and Philosophy of Engineering Education

A. Justification for the Course:

- Provide a complete and detailed explanation of the need for the course (e. g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing fields of study and/or areas of specialization, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.

- Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)

- Grading criteria (select from dropdown box); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

Criteria Papers and Projects

- Identify the method(s) of instruction (select from dropdown box) and describe how the methods promote the likely success of the desired student learning outcomes.

Method of Instruction Lecture

C. Prerequisite(s):

- List prerequisite courses by subject abbreviation, number, and title.
- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

D. Course Instructor(s):

- Provide the name, rank, and department/program affiliation of the instructor(s).
- Is the instructor currently a member of the Graduate Faculty? X Yes __ No
  (If the answer is no, indicate when it is expected that a request will be submitted.)

E. Course Outline:

- Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

F. Reading List (including course text):

- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.
- A secondary reading list or bibliography should include material students may use as background information.

G. Library Resources

- Describe the library resources that are currently available or the resources needed to support this proposed course.

H. Example of a Course Syllabus (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the *Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs*. See Appendix K.)

http://www.gradschool.purdue.edu/downloads/Graduate_School_Policies_and_Procedures_Manual.pdf

ENE 502 - History and Philosophy of Engineering Education

A. Justification for the Course:

The course is explicitly identified in the ENE PhD requirements as a "foundation course" required for all students.

As a foundation course, it provides an intellectual framework for identifying research opportunities in engineering education in terms of the nature of engineering, the purpose and process of engineering education, and drivers for leadership and change in engineering education. These topics are synergistic with the five research areas defined by the national *Engineering Education Research Colloquium* (engineering epistemology, learning mechanisms, learning systems, diversity and inclusiveness, and assessment methodologies). As such, the course has a history of attracting students from the College of Education who are broadly interested in STEM topics and is likely to be of interest to graduate students in other Departments, Schools, or Colleges with engineering education or related interests.

Since many of the students who enter the ENE program come from diverse engineering and in some cases non-engineering backgrounds, the course also serves as an entry point for developing core ENE competencies (which are required as part of the ENE PhD graduate requirements). In particular: think critically and reflectively, communicate knowledge, synthesize knowledge, and participate actively in professional community.

The course also provides an important foundation for the following ENE required courses:

- Theories of Development and Engineering Thinking – by providing rich opportunities to discuss and critique perspectives on the nature of engineering thinking and the role of engineering education in developing engineering thinking.
- Leadership, Policy and Change in STEM Education – by identifying and critiquing drivers for change in engineering education including perspectives that are typically included or excluded in decision making.
- Pedagogy, Content, and Assessment – by inquiring into the aims and process of engineering education (e.g., instruction, pedagogy, and assessment).

The level of the proposed course is at the 50000-level because (1) the target audience is ENE PhD students (approximately 12-16 graduate students per Fall term), (2) successful completion of the course requires students of high intellectual rigor who can synthesize and critique diverse perspectives, make and support claims regarding engineering education, and apply their knowledge to articulate future roles and opportunities in engineering education, (3) instructional techniques require a substantial level of reflection, critique, and argumentation, and (4) course assignments are based on an ability to critique, synthesize, and apply knowledge (which represent attributes of higher level thinking.

B. Learning Outcomes and Method of Evaluation or Assessment:

Course objectives: The purpose of this course is to (1) develop a culture of critical reflection, engagement, and collaborative learning, (2) provide opportunities for students to identify and understand tools to inquire into the history and philosophy of engineering education and develop the skills for using these tools, and (3) provide opportunities for students to use these inquiry tools to form persuasive arguments about the nature of engineering education. These course objectives map to the following ENE PhD competencies: think critically and reflectively, communicate knowledge, synthesize knowledge, and participate actively in professional community.

Student learning outcomes (skills, knowledge, values, identity) that address course objectives (1, 2, 3 above) and ENE PhD competencies are identified in the table below.

Objective 1A: Develop general values associated with critical thinking and reflection

- Instructional objectives: Opportunities to stretch and broaden my view, challenge my point of view, clarify my ideas through writing, and express and explain my own views in class;
- Skills: Learn how to recognize and evaluate arguments through different epistemological lenses and modes of persuasive evidence;
- Knowledge: Identify and synthesize contexts and epistemologies that have shaped and continue to

shape engineering education, including who gets to be an engineer and the goals-aims-purpose-process of engineering education;
- Values: Become more comfortable with sitting with/in/around intellectual tensions regarding the nature of engineering, the paradoxes of boundaries and definitions, and multiple epistemic ways of knowing;
- *Link to ENE Graduate Competencies: Think critically and reflectively, communicate knowledge; synthesize knowledge;*

Objective 1B: Develop a culture of intellectual engagement, both inside and outside ENE
- Instructional objectives: Instructors who are actively helpful when students have problems, respect student questions or comments, and provide a meaningful learning experience;
- Identity: Develop into an active contributing member of the Purdue ENE scholarly community, and the engineering education research community more broadly;
- Values: Become comfortable participating in a community that values curiosity, a culture of play, boundary blurring, and respect for different (and often competing) perspectives
- *Link to ENE Graduate Competencies: Participate actively in professional community*

Objective 1C: Engage with others to learn together
- Instructional objectives: Team teaching, classroom discussion, opportunity to learn from other students and through group and collaborative work;
- *Link to ENE Graduate Competencies: Communicate knowledge*

Objective 2: Develop (specific) skills and apply (specific) tools to be able to think critically and reflectively about "engineering education"
- Instructional objectives: Opportunities to synthesize knowledge from many sources;
- Skills: Become facile with using philosophical and historical modes of inquiry in order to make visible, critically reflect on, and compare engineering and educational epistemologies;
- Knowledge: Problematize different ways of knowing including articulating and justifying your own way of knowing; Identify, understand and use tools and frameworks for critical reflection and analysis of philosophical, epistemological, and historical arguments (e.g., insider and outsider perspectives, philosophies of education, epistemological perspectives, and archival research and historical documents to reveal enacted philosophies of engineering education);
- *Link to ENE Graduate Competencies: Synthesize knowledge*

Objective 3A: Apply tools to synthesize knowledge
- Instructional objectives: Provide tools for critical reflection, analysis, and synthesis;
- Knowledge: Identify, understand and use tools and frameworks for comparison analysis (i.e., what is engineering, who gets to be an engineer, what is the purpose and process of engineering education, and what shapes engineering education?); Identify and synthesize perspectives on the nature of engineering (what engineers know and how they know it);
- *Link to ENE Graduate Competencies: Synthesize knowledge*

Objective 3B: Develop my own perspective/identity on engineering
- Instructional objectives: Provide background for further study, be intellectually fulfilling, and support professional growth;
- Identity: Begin to develop an identity as an engineering education researcher – and your potential in shaping engineering as a profession, the education of engineers, and the work of engineering education researchers
- *Link to ENE Graduate Competencies: Engage in professional development*

Methods of evaluation and assessment

Grading criteria: Papers and projects

Criteria used to assess students and articulate final grades are based on four tasks weighted as a percentage of the total final grade (see table below).

Task 1 is "**engagement**": based on weekly class discussion (attendance and engagement). Students are required to contact the instructors regarding absences and must complete an additional task as a	15% of total grade (assessed weekly)	The total grade is based on the following guideline: an A for engaging in all classes, a B for missing 2 classes or not contributing during 75% of the class meetings, a C for

substitute for missing class discussion. Students may complete additional work to compensate for up to 2 absences.		missing 3 classes or not 50% of the class meetings, a D for missing 4 classes, and an F for missing 5 or more classes.
Task 2 is "**reflection blog posts**", based on contributions to the course blog that are used to prepare students for substantive class discussions.	10% of total grade (assessed weekly)	Individual contribution grades are based on the following guideline: 0 = not turned in; 1 = contribution substantially lacks clarity, organization, depth of reflection; 2 = made clear claims but needs work in substantiating claims; 3 = provided well grounded, clear, and persuasive arguments.
Task 3 involves three "**synthesis-identity essays**" that each map to a major course theme (nature of engineering, purpose of education, philosophy of engineering education) and provide opportunities for students to reflect on their role as future engineering educators in relation to the goals, aims, and process of engineering education. Individual essays are expected to be between 4 and 7 pages double-spaced, and are reviewed by instructors and peers with opportunities to incorporate feedback.	45% of total grade (each essay is 15%)	The feedback criterion addresses levels of "completeness", "grounded arguments", "well-organized", "clear", and "engaging". The final grade is based on incorporating feedback based on the criterion.
Task 4 is a group **YouTube video** (2 minutes minimum, 10 minutes maximum) that presents a philosophy for the future of engineering education (using ideas from discussions, reflection blogs, and synthesis-identity essays) and will be presented in class. Accompanying the video is a brief rationale that includes (1) who the message is intended for, and why, and (2) what message you hoped to send, and why.	30% of total grade	There are multiple points for instructor and peer feedback. The YouTube feedback criterion addresses levels of "completeness", "grounded arguments", "well-organized", "clear", and "engaging". The final grade is based on incorporating feedback based on the criterion.

Method of instruction
Lecture

The instructional approach is based on extensive classroom discussion, reflection assignments, and instructor and peer feedback on course projects. Course projects complement instruction by providing opportunities to iteratively synthesize course topics and collaboratively apply knowledge to develop a philosophical statement on the purpose and process of engineering education (see table above).

Instruction focuses on examining the history and philosophy of engineering education through tools and frameworks that guide critical reflection and analysis of philosophical, epistemological and historical arguments regarding (1) what is (and should be) considered engineering, (2) what is (and should be) the purpose and process of engineering education, (3) who gets to be an engineer (and who should be), and (4) what shapes these decisions (and what should shape them)? Tools and frameworks include: reflective practice and paradox, insider and outsider perspectives on engineering, philosophies of education, archival research and historical documents, and boundary work (as a tool for understanding how disciplinary boundaries are managed).

Instructional methods promote likely success of desired student learning outcomes because they focus on building skills in reflection, critique, argumentation, and synthesis necessary for producing high quality course projects that target course learning goals. In addition, course projects are iteratively developed with multiple opportunities for peer and instructor feedback.

C. Prerequisite(s):

There are no course prerequisites. Because ENE does not provide a Master's degree and students apply to ENE from a broad range of disciplines (engineering, physics, math, etc.) it would be difficult to define a set of course prerequisites. In addition, as a foundation class the expectation is that this course provides a foundation for future ENE courses.

While there are no prerequisites, interested students must be currently enrolled in a graduate program at Purdue University. Graduate students not in the ENE program must request permission to enroll from the instructor.

D. Course Instructor(s):

Dr. Robin Adams, Assistant Professor, School of Engineering Education
Dr. Alice Pawley, Assistant Professor, School of Engineering Education

Both instructors are currently members of the Graduate Faculty.

E. Course Outline:

The tentative syllabus below describes course topics and indicates the relative amount of time devoted to three topic areas: philosophy of education, nature of engineering, and history of engineering education. The readings below suggest the current plan and may be modified over the course of the semester.

Date	***Preparation needed for this class***
Before classes start	Read Schön and Palmer; may pre-read Noddings Bring in a photo that represents engineering to you
Week 1 Aug 27	***Introduction; Talking tools (critical reflection, paradox)*** Schön, Donald (1995) "Knowing in Action: The New Scholarship Requires a New Epistemology." *Change*, Nov/Dec pp. 27-34. Palmer, Parker (1998) *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life.* Jossey-Bass. Chapter 3, pp. 61-88.
Week 2 Sept 3	***Foundational philosophies of education, part 1: the purpose of education and who should be educated; Tools (goals-aims-process of education, who is educated, consequences)*** Noddings, Chapters 1-4
Week 3 Sept 10	***Foundational philosophies of education, part 2: the purpose of education and who should be educated; Tools (epistemology, what is persuasive)*** Noddings, Chapters 5-7
Week 4 Sept 17	***Taxonomies of learning: How epistemologies frame educational practice; Tools (boundary work, classification schemes)*** Bowker, Geoffrey C. and Susan Leigh Star. 1999. *Sorting Things Out: Classification and Its Consequences.* Cambridge, MA: MIT Press. Introduction: To Classify Is Human, pp. 1-3 Culver, Richard S. and JoAnn T. Hackos. 1982. "Perry's Model of Intellectual Development." *Engineering Education*:221-226. Hogsett, Charlotte. 1993. "Women's Ways of Knowing Bloom's Taxonomy." *Feminist Teacher* 7:27-32. Svinicki, Marilla D. and Nancy M. Dixon. 1987. "The Kolb Model Modified for Classroom Activities." *College Teaching* 35:141-146. Langford, David. 1991. "Bloom's Taxonomy: Levels of Learning." in *Creating a Collaborative Learning Environment Resource Book.* Madison: Center for the Integration of Research Teaching and Learning.
Week 5 Sept 24	***YouTube skills*** **Assignment**: read peers' synthesis papers, provide feedback
Week 6 Oct 1	***What do engineers describe as engineering? ; Tools (insider perspectives on engineering)*** Bucciarelli, Louis L. (2003) *Engineering Philosophy.* DUP Satellite Press. Chapters 1-4, pp. 1-75. Koen, Billy Vaughn (2003) Discussion of the Method: Conducting the Engineer's Approach to Problem Solving. Oxford University Press. Chapter 1: Some Thoughts on Engineering, pp. 7-25. Jonassen, D. H., J. Strobel, et al. (2006). Everyday Problem Solving in Engineering: Lessons for Engineering Educators, *Journal of Engineering Education* 95(2), pp 139-151. **Assignment:** Synthesis paper on education.
Week 7 Oct 8	***Engineering as science and as a profession; Tools (boundary work)*** Gieryn, Thomas F. 1999. *Cultural Boundaries of Science: Credibility on the Line.* Chicago: University of Chicago Press. Introduction, pp. 1-35. Layton, Edwin T. (1971) The Revolt of the Engineers: Social Responsibility and the American

Engineering Profession. Chapters 2-3, pp. 25-78.
Noble, David F. 1979. *America by Design: Science, Technology, and the Rise of Corporate Capitalism.* New York: Alfred A. Knopf, Inc. Chapters 2-3, pp. 20-49.

Assignment: Bring in a page from your transcripts (just the classes you took, not your grade) of your bachelor's in engineering degree.

Week 8 ***Engineering as design; Tools (boundary work)***
Oct 15
Cross, N. (2006). *Designerly Ways of Knowing.* London: Springer-Verlag. Chapter 1-2
Rowland, Gordon. 2004. "Shall We Dance? A Design Epistemology for Organizational Learning and Performance." *ETR&D* 52:33-48.
Simon, H. A. (1969). The sciences of the artificial. Cambridge, MA: MIT Press. Chapter 1, pp. 1-17.

Read one of the following:
Petroski, Henry (1996) *Invention by Design: How Engineers Get from Thought to Thing, Chapters 1 and 6.* Harvard University Press.
Bucciarelli, L. L. (1996). *Designing engineers.* Cambridge: MIT Press. Chapter 1 and 6.

Week 9 ***Engineering by outsiders; Tools (outsider perspectives, boundary work, engineering in the wild)***
Oct 22
Forsythe, Diana E. (2001) *Studying Those Who Study Us: An Anthropologist in the World of Artificial Intelligence.* Stanford University Press. Chapter 3: Engineering Knowledge: The Construction of Knowledge in Artificial Intelligence, pp. 35-58
Latour, Bruno & Steve Woolgar. (1986) *Laboratory Life: The Construction of Scientific Facts.* Princeton University Press. Chapter 2: An Anthropologist Visits the Laboratory, pp. 43-103
Svarovsky, Gina Navoa and David Williamson Shaffer. (2006) "Design meetings and design notebooks as tools for reflection in the engineering design course." *Proceedings of the 36th ASEE/IEEE Frontiers in Education Conference, San Diego CA Oct 28-31 2006.*

Week 10 ***What is engineering education? ; Tool (Engineering education in the wild)***
Oct 29
Sheppard, S.D., Macatangay, K., Colby, A. and Sullivan, W.M. (2008). *Educating Engineers: Designing for the Future of the Field.* San Francisco: Jossey-Bass.

Assignment: Engineering education in the wild (see Hutchins)
Peer review of synthesis essay

Resource: Hutchins, Edwin. *Cognition in the Wild.* NetLibrary, Inc. Handout summary.

Week 11 ***History of engineering education, part 1; Tools (archival research and historical documents)***
Nov 5
Reynolds, Terry S. (1992) "The Education of Engineers in America Before the Morrill Act of 1862," *History of Education Quarterly* 32(Winter) pp. 459-82
Seely, Bruce E. 1999. "The Other Re-engineering of Engineering Education, 1900-1965." *Journal of Engineering Education* 88:285-294.

Read one of:
Mann, Charles Riborg. 1918. "A Study of Engineering Education." Carnegie Foundation for the Advancement of Teaching, New York. (Selected sections)
Society for the Promotion of Engineering Education. (1930) "Report of the Investigation of Engineering Education 1923-1929."Pittsburgh, PA. (Wickenden Report: selected pages)
Collection 2004. "Journal of Engineering Education Round Table: Reflections on the Grinter Report." *Journal of Engineering Education*:69-94.
Goals Committee. 1968. "Goals of Engineering Education: Final Report of the Goals Committee." American Society for Engineering Education, Washington DC.

Assignment: synthesis essay on education due.

Week 12 ***History of engineering education, part 2; Tools (boundary work)***
Nov 12
Slaton, Amy E. 2001. *Reinforced Concrete and the Modernization of American Building, 1900-1930.* Baltimore: Johns Hopkins University Press. (Selected chapters)
Bix, Amy Sue (2002) "Equipped for Life: Gendered Technical Training and Consumerism Home Economics, 1920-1980." *Technology and Culture* 43:728-754.
Bix, Amy Sue (2005) "Engineering National Defense: Technical Education at Land-Grant Institutions

during World War II," in *Engineering in a Land-Grant Context: The Past, Present and Future of an Idea*, ed. Alan I. Marcus. Purdue University Press, pp. 105-133

Week 13	***Examples of bridging philosophy and practice***
Nov 19	(Read either ethics set, or critical theory set)
	Ethics readings:
	Noddings, Chapter 8
	Pfatteicher, Sarah (2001) "Teaching vs. Preaching: EC2000 and the Engineering Ethics Dilemma" *Journal of Engineering Education*, January, pp. 137-142
	Harding (2008)
	Critical theory readings:
	Noddings, Chapter 9
	Riley, Donna. 2003. "Employing liberative pedagogies in engineering education." *Journal of Women and Minorities in Science and Engineering* 9:137-158.
Week 14	**THANKSGIVING**
Nov 26	No class.
Week 15	***Engineering education research and Scholarship of Teaching and Learning (SOTL)- Present and Future Views***
Dec 3	Committee on the Engineer of 2020 Phase I. 2004. "The Engineer of 2020: Visions of Engineering in the New Century." National Academy of Engineering, Washington DC. Executive summary
	National Engineering Education Research Colloquies 2006. "The Research Agenda for the New Discipline of Engineering Education." *Journal of Engineering Education*: 259-261.
	ASEE (in press) "Creating a Culture for Systematic and Scholarly Engineering Educational Innovation: Ensuring U.S. engineering has the right people with the right talent for a global society".
	Adams, R.S. and Felder, R. (2008) "Special Guest Editorial – Reframing Professional Development: A Systems Approach to Preparing Engineering Educators to Educate Tomorrow's Engineers." Journal of Engineering Education, July, pp 239-240.
Week 16	***Synthesis of the course***
Dec 10	**Assignment:** Peer review of synthesis essays
Final exam week	Final presentations: YouTube videos and rationale
	Assignment: Synthesis essay on engineering education due.

F. Reading List (including course text):

- Noddings, Nel (2007). *Philosophy of Education*, 2nd Ed. Westview, 2007.
- Other readings identified in course outline.

G. Library resources:

- Noddings (2007) is available on library reserve
- All other readings are available on Blackboard Vista.

Office of the Registrar
FORM 40G REV. 7/08

EFD 28-01

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

DEPARTMENT: Engineering Education | EFFECTIVE SESSION: 200910

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [x] 1. New course with supporting documents (complete proposal form)
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	ENE	Subject Abbreviation	
Course Number	502	Course Number	
Long Title	History and Philosophy of Engineering Education		
Short Title	Hist Phil ENE		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[ ] Summer [x] Fall [ ] Spring

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [x] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only	[x]	6. Registration Approval Type	
2. Satisfactory/Unsatisfactory Only	[ ]	Department [ ]	Instructor [x]
3. Repeatable	[ ]	7. Variable Title	[ ]
Maximum Repeatable Credit:	[ ]	8. Honors	[ ]
4. Credit by Examination	[ ]	9. Full Time Privilege	[ ]
5. Special Fees	[ ]	10. Off Campus Experience	[ ]

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3		
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Examines the history and philosophy of engineering education by 1) exploring the history of engineering education through archival research and historical documents (critical moments, tensions, issues), 2) investigating philosophies of education and the philosophies that have guided engineering as a profession, and 3) critiquing the evolution of engineering education, identifying alternative scenarios, and imagining a future role in engineering education. This course introduces students to the field of engineering education while broadening their views of the roles of interrelationships between teaching and research.

	Date	Calumet School Dean	Date	Calumet Undergrad Curriculm Committee	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Chancellor	Date
				RJ Cipra	10/15/08
Indianapolis Department Head	Date	Indianapolis School Dean	Date	Undergrad Curriculm Committee	Date
North Central Department Head	Date	North Central Chancellor	Date	Date Approved by Graduate Council	
West Lafayette Department Head	8/24/08 Date	West Lafayette College/School Dean	10/27/2008 Date	Graduate Council Secretary	Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

(Grad Form 40G [Excel format] - Does not include the Graduate Council's required supporting document. See pdf version of Form 40G)

Engineering Faculty Document No. 58-07
January 23, 2008

To: The Faculty of the College of Engineering
From: Department of Engineering Education
Subject: New Graduate Course, ENE 502

The faculty of the Department of Engineering Education has approved the following new graduate ENE course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENE 502 History and Philosophy of Engineering Education

Sem. 1, Class 3, Cr. 3.

Prerequisite: Open to students in Engineering Education or by consent of instructor.

Course description:
This course examines the history and philosophy of engineering education by (1) exploring the history of engineering education through archival research and historical documents (critical moments, tensions, issues), (2) investigating philosophies of education and the philosophies that have guided engineering as a profession (this includes characterizations on the nature of engineering), and (3) critiquing the evolution of engineering education, identifying alternative scenarios, and imagining a future role in engineering education. Common threads for discussion and reflection include: what is engineering, what should be the purposes of engineering education, who gets to be an engineer, who gets to be involved in these decisions, and where and how are these decisions made?

Reasons: This is a required course for the graduate programs in the Department of Engineering Education (ENE). This new course will also be of interest to graduate students in other Departments, Schools, and Colleges with engineering education or related interests. The intent of the course is to introduce students to the field of engineering education while broadening their views of the roles of and interrelationships between teaching and research. Our thesis is that understanding engineering education from historical and philosophical perspectives will facilitate making sense of the present as well as improve skills for forecasting and designing future paths.

This course was previously offered as ENE 695M – History and Philosophy of Engineering Education in Fall 2007. Eight (8) students were enrolled in the class; 7 of these students were from the ENE program and one student was from the College of Education. Evaluation results indicate that the course exceeded student expectations, and that students valued the teaching styles, course activities, and pedagogical approaches.

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE
ECC Minutes #25
Date 5/9/08
Chairman ECC Michael Dyrenski

Kamyar Haghighi, Head
Engineering Education

Supporting Documentation

1. Level: Graduate

2. Course Instructors: Robin Adams, Karl Smith, Alice Pawley

3. Course Syllabus, Reading, and Grading

Syllabus

Weeks 1-2: *Reflecting on the "present" and getting ready for this course (learning how to read history, policy, and philosophy perspectives). 2-3 readings per week.*

Week 1	– Who are you / we (collective stories)? – What is engineering (now and into the future)? – What are trends or calls for change/reform? – Setting the tone and learning environment – 1-2 readings
Week 2	– What are crucial issues/current trends in engineering education? Where are they coming from? – How to read history, policy, and philosophy? – How to write reflection assignments? – 2-3 readings, scaffolded reflection assignment

Week 3 - 9: *Examining and critiquing "the past"*: a chronology that emphasizes (1) critical moments (their context and their impact on what is engineering, who is an engineer, and how engineers are prepared for the profession), (2) philosophical evolutions (education, engineering, science, art, design), and (3) comparative cases on the nature of engineering, science, and design. (2-3 readings per week)

Week 3	– Overview (from 1800's to 1980's) – what is engineering, who decides and where does it get decided? – Introduction to philosophy of education
Week 4	– Emergence of engineering education (1830's to early 1900's) – 2-3 readings
Week 5	– Growth and specialization in engineering education (1900's to 1940's) – Engineering education tracks and construction of engineering professional identity – 2-3 readings
Week 6	– Engineering sciences (1950's to 1990's) – Comparison of our engineering education experiences (e.g., course requirements) – 2-3 readings
Week 7	– Review and critique – engineering values and philosophy; engineering "culture" – Comparative cases – engineering, science, design – 2-3 readings
Week 8	– Fall Break & Frontiers in Education Conference
Week 9	– What is engineering and how has it evolved? – What has influenced a philosophy of engineering and how engineers are prepared for the profession? – What might *have been* alternative paths?

Weeks10-11: *The "present" revisited*: situating current perspectives in "the past" and critiquing current views on the nature of engineering and engineering education. (2-3 readings per week.)

Week 10	– Revisit: What do you think are the crucial issues, what do others think, what is influencing these ideas?
Week 11	– What is your (current) engineering education philosophy? – How does this compare with others (e.g., science, art, design)? – How does this compare with ideas about preparing professionals?

Week12-16: *Alternative futures*: analyzing current reform efforts, forecasting alternative paths, and imagining your future role in engineering education.

Week 12	– What are current calls for engineering education reform and research? – 2-3 readings
Week 13	– What does it mean to forecast? – What might be future engineering education scenarios?
Week 14	– What is your vision for the future (and what is your role in this vision)? – Thanksgiving Break
Week 15	– Share "Future scenarios" from draft assignment and situate in the past and present – Given a historical and philosophical perspective, what would you anticipate would help / hinder you in reaching this vision? – Peer feedback on philosophy statements
Week 16	– Synthesis and summary – Course evaluations / reflection on learning

Readings

ABET Board of Directors. 2007. *2007-2008 Criteria for Accrediting Engineering Programs.*

Journal of Engineering Education Editorial Board 2004. "Journal of Engineering Education Round Table: Reflections on the Grinter Report." *Journal of Engineering Education*:69-94.

Barad, Karen. 2001. "Scientific Literacy->Agential Literacy=(Learning+Doing) Science Responsibly." Pp. 226-246 in *Feminist Science Studies: A New Generation*, edited by M. Mayberry, B. Subramaniam, and L. H. Weasel. New York: Routledge.

Bix, Amy Sue. 2002. "Equipped for Life: Gendered Technical Training and Consumerism in Home Economics, 1920-1980." *Technology and Culture* 43:728-754.
Brin, David. 2006. "Prediction as faith, prediction as a tool: peering in to tomorrow's world." *Futures Research Quarterly*:15-24.

Committee on the Engineer of 2020 Phase I. 2004. "The Engineer of 2020: Visions of Engineering in the New Century." National Academy of Engineering, Washington DC. Executive summary

Cowan, Ruth Schwartz. 1985. "How the refrigerator got its hum." Pp. 202-218 in *The Social Shaping of Technology: How the refrigerator got its hum*, edited by D. MacKenzie and J. Wajcman. Philadelphia: Open University Press.

Riley, Donna. 2003. "Employing liberative pedagogies in engineering education." *Journal of Women and Minorities in Science and Engineering* 9:137-158.

Roller, D. "Case 3: The early development of the concepts of temperature and heat - The rise and decline of the caloric theory". Manuscript provided in class.

Rowland, Gordon. 2004. "Shall We Dance? A Design Epistemology for Organizational Learning and Performance." *ETR&D* 52:33-48.

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Grading

Readings and class participation (includes reflection on learning assignment on last day) 20%

Historical evolution of engineering education & engineering profession 20%
Oral Presentation - Depiction of the major developmental events for a selected engineering discipline.

The Present Revisited- Nature of Engineering, Science, Art and Design Written assignment - "Elevator speech" on the nature of engineering and how it compares to other kinds of professions. 20%

Future Scenarios 20%
Group Presentations - Design a future scenario. Group provides peers with either a short paper, storyboard, picture or other format, and leads a discussion in which the rest of the class takes on the role of the NAE Engineer of 2020 Advisory Committee to identify "the attributes and education of the Engineer of 2020".

Engineering Education Philosophy 20%
Written assignment - Engineering educational philosophy.

Supporting Document for a New Graduate Course

To: Purdue University Graduate Council

From:
Faculty Member: Kamyar Haghighi
Department: Engineering Education
Campus: Purdue University West Lafayette

Date:

Subject: Proposal for New Graduate Course-Documentation Required by the Graduate Council to Accompany Registrar's Form 40G

For Reviewer's comments only (Select One)

Reviewer:

Comments:

Contact for information if questions arise:
Name: Suzie Schilling
Phone Number: 45755
E-mail: suzie@purdue.edu
Campus Address: 1300 ARMS

Course Subject Abbreviation and Number: ENE 502

Course Title: History and Philosophy of Engineering Education

A. Justification for the Course:

- Provide a complete and detailed explanation of the need for the course (e. g., in the preparation of students, in providing new knowledge/training in one or more topics, in meeting degree requirements, etc.), how the course contributes to existing fields of study and/or areas of specialization, and how the course relates to other graduate courses offered by the department, other departments, or interdisciplinary programs.

- Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).

- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)

- Grading criteria (select from dropdown box); include a statement describing the criteria that will be used to assess students and how the final grade will be determined.

Criteria Attendance and Class Participation

- Identify the method(s) of instruction (select from dropdown box) and describe how the methods promote the likely success of the desired student learning outcomes.

Method of Instruction Presentation

C. Prerequisite(s):

- List prerequisite courses by subject abbreviation, number, and title.
- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

D. Course Instructor(s):

- Provide the name, rank, and department/program affiliation of the instructor(s).
- Is the instructor currently a member of the Graduate Faculty? __ Yes __ No
  (If the answer is no, indicate when it is expected that a request will be submitted.)

E. Course Outline:

- Provide an outline of topics to be covered and indicate the relative amount of time or emphasis devoted to each topic. If laboratory or field experiences are used to supplement a lecture course, explain the value of the experience(s) to enhance the quality of the course and student learning. For special topics courses, include a sample outline of a course that would be offered under the proposed course.

F. Reading List (including course text):

- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.
- A secondary reading list or bibliography should include material students may use as background information.

G. Library Resources

- Describe the library resources that are currently available or the resources needed to support this proposed course.

H. Example of a Course Syllabus (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the *Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs*. See Appendix K.)

http://www.gradschool.purdue.edu/downloads/Graduate_School_Policies_and_Procedures_Manual.pdf