

PURDUE UNIVERSITY

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

Print Form

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

Graduate Council Doc. No. 10-24a

EFD 55-10

DEPARTMENT School of Engineering Education

EFFECTIVE SESSION ~~Fall 2009~~ ~~SP 2010~~ Fall 2011

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

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

PROPOSED:

EXISTING:

Subject Abbreviation ENE Subject Abbreviation _____
 Course Number 50300 Course Number _____
 Long Title Engineering Education Inquiry
 Short Title ENGR EDUC INQUIRY

TERMS OFFERED

Check All That Apply:

Summer Fall Spring

CAMPUS(ES) INVOLVED

Calumet N. Central
 Cont Ed Tech Statewide
 Ft. Wayne W. Lafayette
 Indianapolis

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

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
 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	<u>150</u>	<u>1</u>	<u>16</u>	<u>100</u>
Pract/Observe				
Research				
Ind. Study				
Experiential				
Clinic				
Distance				
Studio				
Lab Prep				
Laboratory				
Simulation				
Pract/Observe				

Update by Janda Maggini, info from EWE Dept 8/13/10. (original attached)

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

This course is conceived as a bridge between beginning graduate students' knowledge of technical research and modes of inquiry appropriate to the new field of engineering education. It is designed as the entryway to required research method courses taken as part of the students' Plan of Study. By the end of this survey course, students will be able to critique research in terms of the quality of the authors' argument based on their chain of reasoning, and will recognize that the articulation of a research question, the significance of the question, the choice of methods in regards to the research goals, and the transparency of the explanation of the methodology are all parts of the chain of reasoning. Prerequisite: Student in Engineering Education or by consent of instructor, Professors Evangelou and Streveler.

Calumet Department Head _____ Date _____	Calumet School Dean _____ Date _____
Fort Wayne Department Head _____ Date _____	Fort Wayne School Dean _____ Date _____
Indianapolis Department Head _____ Date _____	Indianapolis School Dean _____ Date _____
North Central Department Head _____ Date _____	North Central Chancellor _____ Date _____
West Lafayette Department Head _____ Date _____	West Lafayette College/School Dean _____ Date _____
Graduate Area Committee Convener _____ Date _____	Graduate Dean _____ Date _____

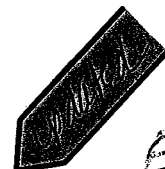
Calumet Undergrad Curriculum Committee _____ Date _____
 Fort Wayne Chancellor _____ Date _____
 Undergrad Curriculum Committee R. Cipe 5/13/2010
 APPROVED 10/21/10
 Date Approved by Graduate Council _____
 Graduate Council Secretary Maureen 10/25/10
 West Lafayette Registrar _____ Date _____

OFFICE OF THE REGISTRAR

11/13/10

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
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EFD 55-10

SP 2010

DEPARTMENT School of Engineering Education

EFFECTIVE SESSION: Fall 2009

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 3. Equivalent Credit: Yes No
 4. Thesis Credit: Yes No

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only
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 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 Mta	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	170	1	14	100
ation				
entation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Updated by Jenda Higgins. Info from EWE Dept 8/13/10. (orig doc attached)

Cross-Listed Courses

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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 <u>R. Ciple</u> Date <u>5/13/2010</u>
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 _____

To: The Faculty of the College of Engineering
From: School of Engineering Education
Subject: New Graduate Course, ENE 503 – Engineering Education Inquiry

The faculty of the School 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 503⁰⁰ - Engineering Education Inquiry

Sem. 1, Class 3, Cr. 3.

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

Course Description:

This course is conceived as a bridge between beginning graduate students' knowledge of technical research and modes of inquiry appropriate to the new field of engineering education. It is designed as the entryway to required research method courses taken as part of the students' Plan of Study. By the end of this survey course, students will be able to critique research in terms of the quality of the authors' argument based on their chain of reasoning, and will recognize that the articulation of a research question, the significance of the question, the choice of methods in regards to the research goals, and the transparency of the explanation of the methodology are all parts of the chain of reasoning.

Reasons:

This is a required course for the graduate program in the School 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 purpose of the course is to provide students

- (1) An experience to demonstrate their ability to synthesize and critique diverse literature, identify a gap in the literature they want to research, and use appropriate methodology to answer this question;
- (2) a bridge between student's previous knowledge of technical engineering research and the new field of engineering education research; and
- (3) an entryway for deeper investigation into research methodologies.

The research philosophy adapted in this graduate level course on inquiry in the newly established field of Engineering Education rests on the assumption that multiple modes and disciplines of inquiry should be explored, adopted and advocated, as they are representative of contemporary academic thought. Research on learning, teaching, practice and policy as well as research design are discussed through diverse paradigms of inquiry (positivist, post-positivist, post-modernist, constructivist and critical theory). On-going discourse on the use of mixed and blended approaches and relationships between quantitative and qualitative methods allows for creative thinking and innovative practice that can reveal the complexity of phenomena under study.

This course was previously offered in Fall Semester of 2007, 2008, and 2009 as ENE 695N–Engineering Education Inquiry. It was co-taught by Ruth Streveler and Demetra Evangelou. For Fall 2009 the course enrolled 18 students – 16 from the ENE program and 2 from other programs (e.g., Nuclear Engineering). Evaluation results indicate the course is well received by students, is achieving its intended learning outcomes, and provides a foundation for students to articulate a research proposal.



David Radcliffe, Interim Head
School of Engineering Education

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes #22

Date #16/10

Chairman ECC R. Cipra

Supporting Document for a New Graduate Course

To: Purdue University Graduate Council

From: Faculty Member: Demetra Evangelou/Ruth Streveler
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 503

Course Title: Engineering Education Inquiry

*SEE
Attached
for
A-H*

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

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

ENE 503 Engineering Education Inquiry
Supporting document for Form 40G Rev 7/08

How to read this document

This is the supplemental document to the Form 40 which is required through University policy to establish or rename a 50000-60000 level course. This document is organized in terms of 7 sections (Sections A-G). We have included an *italicized* description for each section to help the read understand would should be included in that section. A table of contents for this document is listed below.

<u>Section</u>	<u>Page</u>
A. Justification for the Course	...2
B. Learning Outcomes and Method of Evaluation or Assessment	...3
C. Prerequisite(s)	...8
D. Course Instructor(s)	...8
E. Course Outline	...9
F. Reading List (including course text)	10
G. Library Resources	11

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.

Explanation of the course: The course is explicitly identified in the ENE PhD requirements as a "foundation course" required for all students. This course is intended to be taken early in a graduate student's curriculum and therefore is designed to be a bridge between the student's previous knowledge of technical engineering research and the new field of engineering education research. It is seen as the entryway for other required research methodology courses taken as part of the student's Plan of Study. This course is intended to help students identify what research methods are appropriate to their interests rather than providing in-depth discussion of specific research methods. To meet this aim, the course provides a balanced overview of the landscape of quantitative and qualitative approaches with an emphasis on the overall scholarly endeavor.

By the end of the course students will be able to critique research in terms of the quality of the authors' argument based on their chain of reasoning, and will recognize that the articulation of a research question, the significance of the question, the choice of methods in regards to the research goals, and the transparency of the explanation of the methodology are all parts of the chain of reasoning.

The research philosophy adapted in this graduate level course on inquiry in the newly established field of Engineering Education rests on the assumption that multiple modes and disciplines of inquiry should be explored, adopted and advocated as they are representative of contemporary academic thought. Research on learning, teaching, practice and policy as well as research design will be discussed through multiple paradigmatic lenses including positivist, post-positivist, post-modernist, constructivist and critical theory. On-going discourse on the use of mixed and blended approaches and relationships between quantitative and qualitative methods allows for creative thinking and innovative practice that can reveal the complexity of phenomena under study.

Major topics to be explored are:

- The nature of inquiry and exploration of the individual as "inquirer"

- The changing nature of engineering education research, particularly as it complements and contrasts with engineering research
- Diverse paradigms of inquiry (positivist, post-positivist, post-modernist, constructivist and critical theory)
- Survey of engineering education research conducted in a broad spectrum of settings
- Research design and methodology appropriate for differing research questions

Justification for course level: The proposed course is at the 50000-level because:

(1) The target audience is ENE PhD students (approximately 10-20 graduate students per Fall term).

(2) Successful completion of the course requires that students develop a research proposal that demonstrates they can synthesize and critique diverse literature, identify a gap in the literature that they want to research, and use appropriate methodology to answer their research question. These activities require creative thinking and an ability to synthesize large amounts of knowledge.

(3) Pedagogical methods used in the course require that students demonstrate independent and critical thinking, and reflection.

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.

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.

The course objectives with associated learning activities and assessment methods are listed in the table on the following page. Course objectives are organized into two categories: knowledge development objectives and professional development activities.

COURSE OBJECTIVES	ACTIVITIES	ASSESSMENT
Knowledge development		
Provides a <i>pathway into the discipline</i> that characterizes the diversity of approaches to engineering education research and research topics	Reading and presentations around a diversity of approaches. Design a research study selecting methodology appropriate for the research question.	Discussion of readings Formulation of a research proposal
Create opportunities to discuss the need for rigorous engineering education research	Readings and discussions of rigor	Critiques of engineering education articles
Develop critical understanding of relationships between research problem, method, and design	Readings, presentation and discussion of the research process	Formulation of a research proposal
Professional development		
Foster community development and collaborative efforts among students and engineering education researchers	Formation of study groups and a collaborative learning environment	Active participation in collaborative activities and assignments
Help students identify conceptual hurdles and individual pathways into research activities	Keeping a reflective journal. Guiding questions around conceptual hurdles	Synthesis of journal entries
Support students' identity development as an engineering education researcher	Keeping a reflective journal Guiding questions around developing an identify as an engineering education researcher	Synthesis of journal entries

Methods of evaluation and assessment: Grading criteria - Papers and projects

Grading criteria used to assess students and articulate final grades listed below.

80% of the final grade is based on the research proposal, completion of the Purdue CITI training (IRB certification) and class participation.

20% of the final grade is based on the reflective summary of your weekly journal questions.

Rubrics used to score the final proposal and the reflective journal will be found on the following pages.

Engineering Education Inquiry Proposal Grading Sheet: Fall 2009

Points will be assigned using the following scale: 0 = absent, 1 = weak, 2 = moderate, 3 = strong

1. Cover section

Cover page	
Table of contents	
Abstract	

2. Introductory section (* = mandatory)

Statement of problem *	
Significance of problem *	
Statement of purpose *	
Limitations of the proposed study *	
If applicable	
Definitions	
Assumptions	
Delimitations of the proposed study	

3. Review of literature section

Integrated findings (NOT a list)	
Summary statement with gap identified	
Research question(s)	

4. Methods section

Introduction that provides an overview of methods and includes a brief lit review of methodology.	
Participants [selection, how many]	
Informed consent [append one sample informed consent letter and a list of the other documents you would submit with the IRB application]	
Procedures	
Instruments or protocols [if applicable, append a copy of one of the instruments/protocols you would use. List all instruments/protocols.]	
Future directions (anticipated analysis results)	

5. Style

References in APA format	
Citations and quotations in APA format	
Tables and figures in APA format	
Methods section written in future tense	
Spell check	
Writing and grammar	

Engineering Education Inquiry
Final Reflective Journal Paper scoring grid
Fall 2009

=====

Yes, No (needs to receive "yes" in all categories to be assigned a grade of A)

- Is the paper of the assigned length?
- Does the paper discuss two themes that the student has identified?
- Is the paper professionally written (grammar, spelling, etc.)?

Points will be assigned using a four point scale based on the following scale:

- 0 = does not illustrate this point,
- 1 = present but weakly illustrated,
- 2 = attribute moderately present
- 3 = attribute strongly illustrated

Quality of reflection	Score
To what degree does the journal paper indicate that the student's thinking has changed over the course of the semester? *	
To what degree do included journal excerpts illustrate that change? *	
To what degree does the student tie reflection to course concepts?	
To what degree does the student use examples from outside the class content to illustrate points?	

* = student needs to receive at LEAST "moderate" in these two categories to receive a grade of A. Expected that at least one category will be "strong."

Inclusion of 3rd and 4th categories (reflection to course concepts, and examples from outside the class content) are optional but will be considered a plus.

Method of instruction: Seminar

The instructional approach for this course emphasizes discussion, synthesis and reflection. Critical thinking will be facilitated through discussion of readings from a variety of sources. To provide a balanced discussion of quantitative and qualitative methods, example articles using both approaches are read and discussed throughout the semester. Students are often asked to work in pairs or small groups to analyze articles and discuss principles of educational research. This small group work is the starting point for larger discussions. Students are asked to share their technical research experience and knowledge to compare or contrast to educational research approaches.

The major deliverable of the course, the final research proposal is written in a way that allows for formative feedback by the instructors and by peers. Successively more expansive drafts are written during the course of the semester and are uploaded to Blackboard where they receive written instructor comments. Drafts are also shared with peers for peer feedback. The students use the rubric for scoring the proposal as a way to provide feedback to peers on their penultimate draft.

These instructional methods promote likely success of desired student learning outcomes because they allow students to practice the skills which are assessed, and to receive formative feedback from the instructors and peers to continuously improve the final product. Standards of assessment are transparent to the students as the final grading rubrics for the two course deliverables (proposal and journal summary) are posted on Blackboard from the first day of the class. These are discussed several times over the semester and are refined based on student questions.

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.

There are no course prerequisites but students must currently be enrolled in a graduate program at Purdue. The course is designed to be the first educational research methods course ENE PhD students take. Thus it is not appropriate to have course prerequisites.

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? (If the answer is no, indicate when it is expected that a request will be submitted.)

Course Instructor(s):

Dr. Demetra Evangelou, Assistant Professor, School of Engineering Education

Dr. Ruth Streveler, Assistant Professor, School of Engineering Education

Both instructors are currently members of the Graduate Faculty.

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.

Course Outline:

The tentative syllabus below describes course topics and indicates the relative amount of time devoted to topic areas.

Class Schedule

Date	Topic	Assignments / Readings
Week 1	How technical research compares and contrasts to engineering education research.	
Week 2	Inquiry Processes in engineering education. Making a claim in research and supporting it with evidence. How is this process similar or different in engineering education research and technical engineering research?	<i>Creswell 1, 2, 3</i> <i>Craft of Research</i> , pages 31-67 Streveler and Smith 2006 DUE: One paragraph draft of Concept Paper
Week 3	Using the library to find engineering education literature	DUE: Concept Paper <i>Creswell 4, 5</i> <i>Craft of Research</i> , pages 68-101
Week 4	Literature reviews in engineering educational research Practice making lit maps	<i>Creswell 6, 7</i> <i>Craft of Research</i> , pages 105-151 Turns, Atman, Adams and Barker 2005
Week 5	Conceptual hurdles for beginning engineering education researchers. Understanding warrants.	<i>Creswell 8, 9</i> <i>Craft of Research</i> , pages 152-170 Borrego 2007
Week 6	Peer review of first drafts	DUE: 1 st draft of Introduction and Literature Review
Week 7	Quantitative approaches in engineering education research Discussion of IRBs and ethical	<i>Creswell 11, 12</i> Ohland et al. 2008 Olds, Moskal and Miller 2005

	issues	
Week 8	October break - no class	
Week 9	Conceptual frameworks in engineering education research	Creswell 13 Svinicki, Conceptual framework
Week 10	Reflection on your journey as an engineering education researcher. Discussion of your journals.	Creswell 14 DUE: CITI training certificate
Week 11	Qualitative approaches in engineering education research.	DUE: 1 st draft of Method (includes <u>revision</u> of Introduction and Literature Review) Creswell 15, 16 Chism et al., Qualitative research basics.
Week 12	Mixed methods in engineering education	Creswell 17, 18 Borrego, Douglas and Amelink 2009
Week 13	Reporting and writing in engineering education research (especially contrasts with technical report writing)	Creswell 10 Koro-Ljungberg and Douglas 2008
Week 14	One-on-one discussions with professors about final paper	DUE: Journal paper
Week 15	Student presentations	Oral presentations
Week 16	Student presentations	Oral presentations
Finals week		DUE: Full proposal

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.

Reading List (including course texts):

Textbooks

- Booth, W. C., Colomb, G.G. & Williams, J. M. (2008). *The Craft of Research, Third edition*. Series: (CGWEP) Chicago Guides to Writing, Editing, and Publishing. University of Chicago Press: Chicago
- Creswell, J. W. (2008). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. (Third edition)* Prentice Hall: Upper Saddle River, N.J.

Additional resources developed for engineering education researchers with NSF funding (Rigorous Research in Engineering Education: Creating a Community of Practice: DUE-0341127)

- Svinicki, M. D. (2008). A guidebook on conceptual frameworks for research in engineering education.
- Chism, N. V., Douglas, E. & Hilson, W. J. (2008). Qualitative research basics: A guide for engineering educators.

Secondary Readings

- Borrego, M. (2007). Conceptual difficulties experienced by trained engineers learning educational research methods. *Journal of Engineering Education*, 96 (2), 91-102.
- Borrego, M., Douglas, E.P., & Amelink, C.T. (2009). Quantitative, qualitative, and mixed research methods in engineering education. *Journal of Engineering Education*, 98 (1), 53-66.
- Koro-Ljungberg, M., & Douglas, E.P. (2008). State of qualitative research in engineering education: A meta-analysis of JEE articles, 2005-2006. *Journal of Engineering Education*, 97 (2), 163-175.
- Ohland, M.W., Sheppard, S.D., Lichtenstein, G., Eris, O., Chachra, D., & Layton, R. (2008). Persistence, engagement and migration in engineering programs. *Journal of Engineering Education*, 97 (3), 259-278.
- Olds, B.M., Moskal, B.M., & Miller, R.L. (2005). Assessment in engineering education: Evolution, approaches, and future collaborations. *Journal of Engineering Education*, 94 (1), 13-25.
- Streveler, R.A. & Smith, K.A. (2006). Guest editorial: Conducting rigorous research in engineering education. *Journal of Engineering Education*, 95 (2), 103-105.
- Turns, J., Atman, C J., Adams, R.S., & Barker, T. (2005). Research on engineering student knowing: Trends and opportunities. *Journal of Engineering Education*, 94 (1), 27-40.

Each student will also compile an extensive, individualized list of readings pertinent to their research topic.

G. Library Resources

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

Library resources:

- Booth, W. C., Colomb, G.G. & Williams, J. M. (2008) and Creswell, J. W. (2008) are available on library reserve.
- Engineering librarian Amy Van Epps provides a lecture in week 3 to assist students in finding engineering education research articles in the Purdue libraries. She has created an online study guide for students in this course at <http://www.lib.purdue.edu/subjectguides/ENEinquiry/>

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GRADUATE SCHOOL
Office of the Dean

To: School of Engineering Education – Linda Higgins

From: The Graduate Programs Office

Date: July 27, 2010

Subject: The Form 40G is being returned for the following information:

- Supporting Document for a New Graduate Course page 1, please fill out top section(included)
- Course Description is blank
- Effective Session indicates Fall 2009
- Schedule Type Section, Weeks Offered is blank

Please return to: Debbie Fellure/Graduate School, Room 160/YONG

Debra Fellure
765-494-6963
dfellure@purdue.edu

Deb —
Updated doc's
Attached. Please
let me know if
you have questions
or this is incorrect.
Thank you,
Linda
#44966

