Office of the Registrar
FORM 40G REV. 10/10

PURDUE UNIVERSITY

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

Print Form

CHE 68500

DEPARTMENT School of Chemical Engineering

EFFECTIVE SESSION Fall 2013 201510

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

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

PROPOSED:	EXISTING:
Subject Abbreviation ChE	Subject Abbreviation
Course Number 68500	Course Number
Long Title Educational Methods in Engineering	
Short Title ~~Ed Methods in ENGR~~ Educ. Method In Engrng	

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

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

CAMPUS(ES) INVOLVED
☐ Calumet ☐ N. Central
☐ Cont Ed ☐ Tech Statewide
☐ Ft. Wayne ☒ 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	☐	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	80	2	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
ENE 68500

RECEIVED
JUL 18 2014
OFFICE OF THE REGISTRAR

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Students will learn how to teach in an engineering environment where both classroom and laboratory instruction is intertwined. Classroom techniques, such as lectures, cooperative groups, mastery and PSI, TV and video, and guided design will be studied, in addition to class preparation issues, such as ABET accreditation and design content. Students will study motivation, learning theories and cycles, and personality types. Includes teaching practice and group projects. NOTE: Change is addition of cross-listing of ENE 68500 with this course.

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 School Dean	Date	Date Approved by Graduate Council	
West Lafayette Department Head AVarma	4-30-13	West Lafayette College/School Dean Michael T. Harris	7/21/14	Graduate Council Secretary	8/19/14
Graduate Area Committee Convener	Date	Graduate Dean Philip E. Pope	7/15/14	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

LAM 7/21/14

72-13-1

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FORM 40G REV. 10/10

PURDUE UNIVERSITY

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

Print Form

ENE 68500

DEPARTMENT School of Engineering Education

EFFECTIVE SESSION Fall ~~2013~~ 201510

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
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- [ ] 11. Change in semesters offered
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PROPOSED:		EXISTING:	
Subject Abbreviation	ENE	Subject Abbreviation	
Course Number	68500	Course Number	
Long Title	Educational Methods in Engineering		
Short Title	~~Ed Methods in ENGR~~ Educ Method In Engrng		

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

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

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		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	75 80	2	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
ChE 68500

RECEIVED
JUL 18 2014
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COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

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North Central Department Head	Date	North Central School Dean	Date	Date Approved by Graduate Council	
West Lafayette Department Head	4/24/13 Date	West Lafayette College/School Dean	7/21/14 Date	Graduate Council Secretary	7/2/14 Date
Graduate Area Committee Convener	Date	Graduate Dean Phillip E. Pope	7/15/14 Date	West Lafayette Registrar	8/21/14 Date

OFFICE OF THE REGISTRAR

LAM 7/21/14

72-13-4

TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Engineering Education and the Faculty of the School of Chemical Engineering

RE: Cross-Listing Approval of ChE 68500 / ENE 68500 Educational Methods in Engineering

The Faculty of the School of Engineering Education has approved the establishment of a new course ENE 68500 and the permanent cross-listing of this course with the existing course ChE 68500. The Faculty of the School of Chemical Engineering are in support of the creation of the new course and have approved the permanent course-listing. Course attributes, descriptions, and pre-requisites are not changing, nor is the content or the syllabus of either course changing. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENE 68500 Educational Methods in Engineering
Terms Offered: Sem. 1 and 2, Lecture 2, Cr. 3.
Cross-listed with ChE 68500

Prerequisite:
Admitted into a Ph.D. program in Engineering or other technical discipline (Finished with MS or MS- bypass), or consent of instructor.

Not open to students who have taken PSY 69500 / EDPS 63400

Description:
Students will learn how to teach in an engineering environment where both classroom and laboratory instruction is intertwined. Classroom techniques, such as lectures, cooperative groups, mastery and PSI, TV and video, and guided design will be studied, in addition to class preparation issues, such as ABET accreditation and design content. Students will study motivation, learning theories and cycles, and personality types. Includes teaching practice and group projects.

Reason:

CHE68500 Educational Methods in Engineering has been in existent for many years. The purpose of this EFD is to cross-list this course in the School of Engineering Education under ENE 68500. This course has been taught by Professor Wankat who holds a joint appointment in CHE and ENE. With his planned retirement ENE wishes to continue offering the course to students across all engineering disciplines including CHE and ENE students. Cross-listing this course both in CHE and ENE would improve student awareness of this course in both programs and promote collaboration between ENE and faculty in the various engineering disciplines in innovative teaching and educational research.

This course was first taught in 1984 and has been offered ten or more times since then. Typical enrollments have been 9-12 but we see this number rising in coming years. Details of the course are attached.

David F. Radcliffe, Head
School of Engineering Education

Arvind Varma, Head
School of Chemical Engineering

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

ECC Minutes 12/6/13

Date 1/14/14

Chairman ECC

ChE 68500 Syllabus

Educational Methods In Engineering Fall 2011

Dates are Tentative and May be Changed

Instructor: Professor Phil Wankat
Phone: 496-7531

Office Location: ARMS 1215
E-mail: wankat@purdue.edu

Class Hours	**M, W, FRNY 1043,** 5:30-6:45 PM
Prerequisites	Admitted into a Ph.D. program in Engineering or other technical discipline (Finished with MS or MS-bypass), or consent of instructor.
Auditing	Postdocs and professors are encouraged to audit the course. If unable to register for the course, graduate students will be allowed to audit. Auditors will be encouraged to participate in discussions and to do homework; however, they will not have an opportunity to participate in the presentations and teaching exercises. Auditing is a privilege not a right – disruptive auditors will be asked to stop attending the course.
Office Hours	Appointment is best although you can try drop-in. Use e-mail, or talk to me before or after class to make an appointment.
Goals	The broad goals of ChE 685 are: 1. Help prepare you for becoming a professor. Schedule an individual meeting with Professor Wankat if you want to discuss your career goals. 2. Help prepare you for college teaching. 3. Expand your horizons about teaching. 4. Make you <u>think</u> about teaching. 5. Provide a small amount of practice.
Textbook	P.C. Wankat and F.S. Oreovicz, Teaching Engineering, McGraw-Hill, New York, 1993. Available free as pdf files at https://engineering.purdue.edu/ChE/AboutUs/Publications/TeachingEng/index.html
Additional Readings	▪ P. C. Wankat, *The Effective, Efficient Professor,* Allyn & Bacon, Boston, 2002. ▪ *Journal of Engineering Education*, available as electronic journal from Purdue Libraries ▪ Other materials as assigned during the semester.
Content Structure	The course is organized into two major parts: ▪ **Part I. Teaching:** Methods and procedures on how to improve teaching. This includes objectives, syllabus, teaching methods, educational technology, testing and so forth. ▪ **Part II. Students**: Types, Development and Learning. This part covers psychological theories of student types, development, and learning theories and motivation. The two parts are intermingled during the semester.
Professional Behavior	To be discussed in class. Consider items such as cheating, plagiarism, self- plagiarism, absences, late attendance, late assignments, students unprepared for discussion, and disruptive behavior
Presentations	Mini-lectures on September 14 and 26. Will be videotaped. Turn in your critique of your presentation one week later.
Participation	In class and in teams

Team Assignments	Everyone will be assigned to a team that will do: 1. Non-lecture teaching team assignment (teaching will be for an entire class period) using active learning methods. Dates are Oct 31, Nov: 2, 7, 9, 14, 16. Topics (each one A-I can be chosen by only one group – order of selection will be by lot): A. How People Learn. B. Service Learning. C. Competitions. D. Teaching through the Cycle. E. Guided Design. F. Evaluation of Teaching. G. Technology in Teaching. H. Increasing Diversity in Engineering. I. Teaching by or for disabilities. J. Group selected and approved by Prof. Wankat. *Topics will be selected in class on Oct. 24.* Teams need to decide in advance the order they want topics (like the football draft – your first choices may not be available by time your team picks). Teams will also turn in a sample homework assignment (it will be graded, but will not be used as class homework). NOTE: The material covered in the team presentations should be included in the student written tests and will be included on the course examination. *And* 2. Will select items for the teaching evaluation form together. Due Oct. 12. If there is someone you do *not* want to be on a team with, give Prof. Wankat this information (written on a piece of paper with your name and the name(s) of those you do not want to work with) no later than October 3 before class.
Other Assignments	1. Various miscellaneous assignments such as: homework from lecture presentation (due day of lecture), homework assignment on objectives, which is due September 28, mastery quiz on ABET October 13-17 with second try on October 18 or 19, first draft of teaching statement due Aug 31 & select items for teaching evaluation form (team exercise - hand in on October 12). 2. Short critique of classroom visits. One page minimum, two page maximum, double-spaced. Due September 12. 3. Write test and solution key for CHE 685. Should be reasonable coverage of topics at different levels of taxonomy. You can share copies (paper or electronic) with your classmates after you turn your test in. Due November 21. 4. Prepare a syllabus including a daily course outline for an advanced graduate elective in your discipline that you would like to teach. Note: this will help in firming up your teaching statement. Due September 21. 5. Second draft of teaching statement. Due December 7. [First draft (will be commented on, but no grade) is due August 31] 6. Other - Could be Theory Paper - The implications and use of in engineering education. Topic: Piaget's Theory or Perry's Theory or Kolb. Or could be Teaching Statement for NSF Career Proposal. 3-4 pages, double-spaced, typed, 12 point Times New Roman with normal margins. Due date is negotiable.
Exam	Will be based entirely or mainly on questions from the exams written by the students. The correct answers to questions will be developed by the instructor. The test will include material from the student lecture presentations and material from the student teams' non-lecture teaching. Date is November 30.
Grading	Must take course for grade (Pass-Not Pass will not be allowed). Although past performance is not a guarantee of future performance, students have earned more A's than B's in the past. More details on grading and % for different items will be discussed in class.

Grading Scheme (developed in class 08/14/2011)	Examination score	20%
	Lecture Presentation (Critique of own presentation)	15%
	Team teaching presentation & sample HW Peer rating	20%
	Assignments:	
	▪ Critique of Classroom Visits	5%
	▪ Syllabus & Course Outline	5%
	▪ Teaching Statement – 2 version	10%
	▪ Test & Solution Writing	10%
	▪ Participation & misc. assignments e.g., HW from lecture presentation; Objectives HW; Mastery quiz on ABET	15%
	Total	**100%**
	Extra Credit (e.g., Teaching Part Career Proposal,or Paper on use of theories)	5

Revised ChE 68500 Course Schedule
Fall 2011

Aug.	22	M	Introduction. Course plan, Syllabus, Professional Behavior, Grading
	24	W	Attitude, Models of Teaching
	29	M	Lecturing and Content Selection
	31	W	Good Teaching & What Works (student selected), Version 1 Teaching Statement due.
Sept.	5	M	**Labor Day – No class**
	7	W	No class (make-up time for extra time on Sept. 14 & 26)
	12	M	Critique class visits due. Discussion of visits. Cooperative group learning.
	14	W	5:30-9:00, Student lectures* (10-12 minutes) + break activity (2-3 minutes)
	19	M	Discipline and Classroom Management
	21	W	Academic Job Hunt panel (Student selected) and Syllabus & Course Outline due
	26	M	5:30-9:00, Student lectures* (10-12 minutes) + break activity (2-3 minutes)
	28	W	Group discussions – Bloom, Piaget & Perry and Objectives HW due
Oct.	3	M	Group discussions – Learning styles
	5	W	Long term co-op groups & PBL. Team assignments will be made
	10	M	**October break NO CLASS**
	12	W	PSI/Mastery. ABET & assessment for ABET. Group selection teacher evaluation
	--	--	HW: Take Mastery quiz on ABET from Karen Heide in Forney 1060 on Oct. 13, 14, or 17. If needed, take second quiz from Karen Heide on Oct. 18 or 19.
	17	M	No class (make-up time for extra time on Sept. 14 & 26)
	19	W	No class (make-up time for extra time on Sept. 14 & 26)
	24	M	Lecture on Testing.
	26	W	No class: First and second groups consult with Professor Wankat
	31	M	Assessment
Nov	2	W	First group teaching. Games and competitions
	7	M	Second group teaching. How People Learn
	9	W	No class: Third and fourth groups consult with Professor Wankat
	14	M	Third group teaching. Teaching with Technology
	16	W	Fourth group teaching. Service Learning
	21	M	Promotion & Tenure – Student choice. Student written tests & solutions due
	23	W	**NO CLASS. THANKSGIVING VACATION**
	28	M	Grading revisited
	30	W	Test
Dec	5	M	Discuss test and scoring. Working with TAs and graders.
	7	W	Course Evaluation. Panel: Experience of new faculty. Second draft teaching statement
	12-16	M-Sat	**FINALS. NO CLASS**

*Student lecture topics: Piaget, Perry, Applications of Perry in Engineering, Bloom's taxonomy, Objectives, Maslow, Motivational interaction theory, Learning styles, Reliability and Validity of Learning styles inventory, Kolb's cycle, deep vs shallow learning, Moffatt's anthropological analysis, why students choose engineering.

Supporting Document for a New Graduate Course

To: Purdue University Graduate Council

From:
Faculty Member: Heidi Diefes-Dux
Department: ENE
Campus: 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
Phone Number: 43884
E-mail: isenberg@purdue.edu
Campus Address: ARMS 1321

Course Subject Abbreviation and Number: ENE 68500

Course Title: Educational Methods in Engineering

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 majors and/or concentrations, 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

72-13-7

- 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? ___ 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

72-13-3