To: The Faculty of the College of Engineering
From: Division of Environmental and Ecological Engineering (EEE)
Subject: New Course EEE 69500

The faculty of the Division of Environmental and Ecological Engineering have approved the following new course to offer temporary courses to graduate students. This action is now submitted to the Engineering Faculty with a recommendation for approval.

EEE 69500 Experimental Courses
Sem. 1, 2. SS. Cr. 0-6.

Course description: Experimental courses at the graduate-level on a temporary basis to test the viability of offering the course on a permanent basis.

Reasons: The intent of this course is to provide a mechanism to offer experimental courses at the graduate-level separate from project or research-based experiences to allow for easier tracking.

Submitted by:

John W. Sutherland
Fehsenfeld Family Head
Environmental and Ecological Engineering

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee
ECC Minutes #3 Date 10-18-16
Chairman ECC

Office of the Registrar
FORM 40G REV. 4/13

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

PRINT

DEPARTMENT: Environmental and Ecological Engineering EFFECTIVE SESSION: Spring 2017

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	EEE	Subject Abbreviation	
Course Number	69500	Course Number	
Long Title	Experimental Courses		
Short Title	Experimental Courses		

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
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.:
2. Variable Credit Range:
   Minimum Cr. Hrs: 0
   (Check One) To [x] Or [ ]
   Maximum Cr. Hrs: 6
3. Equivalent Credit: Yes [ ] No [x]
4. Thesis Credit: Yes [ ] No [x]

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

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Topics vary. Arrange hours and credit. Permission of instructor required.

*COURSE LEARNING OUTCOMES:

Learning outcomes will be designed by the instructor to meet a level of academic rigor consistent with the course level given the specific course content.

Calumet Department Head	Date	Calumet School Dean	Date	Calumet Director of Graduate Studies	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Fort Wayne Director of Graduate Studies	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	IUPUI Associate Dean for Graduate Education	Date
North Central Department Head	Date	North Central School Dean	Date	North Central Director of Graduate Studies	Date
West Lafayette Department Head	7/7/16 Date	West Lafayette College/School Dean	7/21/16 Date	Date Approved by Graduate Council	Date
Graduate Area Committee Convener	Date	Graduate Dean	Date	Graduate Council Secretary	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)

Detailed Graduate Course Proposal for Academic Review

Note: The detailed course proposal is intended for academic review by the appropriate area committee of the Graduate Council. It supplements the Form 40G that is intended for administrative review of the Graduate School and Registrar.

To: Purdue University Graduate Council

From: Faculty Member: John W. Sutherland
Department: Environmental and Ecological Engineering
Campus: West Lafayette

Date: July 8, 2016

Subject: Proposal for New Graduate Course

Contact for information if questions arise:
Name: Nina L. Robinson
Phone: 67578
Email: nlrobins@purdue.edi
Address: POTR

Course Number: EEE 69500
Course Title: Experimental Courses
Short Title: Experimental Courses

Course Description:

Experimental courses at the graduate-level on a temporary basis to test the viability of offering the course on a permanent basis.

A. Justification for the Course

Justification of the need for the course

- There is a need to have a temporary course number that will allow the faculty in Environmental and Ecological Engineering (EEE) to develop new courses, assess their effectiveness and finalize their structure prior to obtaining a permanent course number.

Justification that course will be taught at a graduate level

- The target audience will be graduate students in engineering. We anticipate that the enrollment will vary from 10-20 depending on the subject matter. The courses will be taught at the graduate level so it is appropriate that it is a 60000 level course.

Justification of the demand for the course

- Anticipated enrollment
  - Undergraduate 0, undergraduates will not be allowed to take this class
  - Graduate 10-20, depending on the subject matter

Justification for online delivery

This class will not be taught online.

B. Learning Outcomes and Methods of Assessment

Since this will be a variable title class not all of the learning outcomes listed in the following will be in each course:

- Enhanced discipline knowledge for environmental and ecological engineering
- Enhancement of oral and written communication skills
- Development of critical and creative thinking in research
- Mastery of ethical research
- Professional Development

Learning Outcomes	Assessment Methods
Enhanced discipline knowledge for environmental and ecological engineering	• Exams and quizzes
Enhancement of oral and written communication skills	• Class presentations (oral) and written assignments (written)
Development of critical and creative thinking in research	• Assessment and scoring of in class participation, assignments, class presentations
Mastery of ethical research	• Assessment and scoring of in class participation, assignments, class presentations
Professional Development	• Assessment and scoring of in class participation

- Since this is a variable title class, the assessment will vary by instructor.

Final Grading Criteria

Depending on the instructor this will vary. All of those assessments will be used with the exception of "Laboratory Exercises".

Methods of Instruction

Depending on the instructor this will vary but those that will not be used have been removed.

Class Hrs/Week	Method of Instruction	Contribution to Outcomes
	Lecture	[click here and explain contribution]
	Presentation	[click here and explain contribution]
	Research	[click here and explain contribution]
	Seminar	[click here and explain contribution]

C. Prerequisite(s)

- There are no course prerequisites. Students must have graduate standing.

If no prerequisites, explain rationale:

- These are experimental classes so it is difficult to determine what courses would be prerequisites.

D. Course Instructor(s)

Various, all instructors will be members of the Purdue Graduate Faculty

E. Course Schedule or Outline

Option 1: Schedule Format

This is a course outline for a potential 600 level course in Advanced Aquatic Chemistry.

Week	Topic(s)	Activity (optional)
1	Introduction and Overview Inorganic Composition of Natural Waters The Thermodynamic Basis for Equilibrium Chemistry	• [Activity]
2	The Thermodynamic Basis for Equilibrium Chemistry	• [Activity]
3	Activity-Concentration Relationships	• [Activity]
4	Fundamentals of Kinetics	• [Activity]
5	Fundamentals of Kinetics	• [Activity]
6	Solving Ionic Equilibrium Problems	• [Activity]
7	Solving Ionic Equilibrium Problems Acid-Base Systems	• [Activity]
8	Acid-Base Systems	• [Activity]
9	Complexation Reactions and Metal Ion Speciation	• [Activity]
10	Complexation Reactions and Metal Ion Speciation	• [Activity]
11	Solubility: Reactions of Solid Phases with Water	• [Activity]
12	Solubility: Reactions of Solid Phases with Water	• [Activity]
13	Redox Equilibria and Kinetics	• [Activity]
14	Redox Equilibria and Kinetics	• [Activity]
15	Special topics and review	• [Activity]
16	Not applicable	Final exam

F. Reading List (including course text)

Primary Reading List

This will vary by instructor, some of what may be used is outlined below.

- Reviews
- Journal Articles
- Other forms of communication

Secondary Reading List

See above

G. Library Resources

Reviews and journal articles required for this class will vary by instructor but this will be available free of charge and electronically through the Purdue Library. Links will be provided with class material.

H. Course Syllabus (now required)

EEE 69500 – Spring 201X
Advanced Aquatic Chemistry
Course Information and Syllabus

I. Administrative

Course Instructor

Graduate Faculty Member
Professor of Environmental and Ecological Engineerings
Division of Environmental and Ecological Engineering
Office: POTR 364
Phone: 765-49x-xxxx
Electronic mail: xxx@purdue.edu
Office hours: Wed.: 1:30-2:30 pm and Tue: 1 – 2 pm or by appointment.

Lecture time and location: Tues. and Thurs. 9:00 am -10:15 am; POTR 364

II. Instructional Resources

a) Course notes
b) Course handouts
c) Blackboard course pages
d) Engineering Library reserves and other material.
e) Companion website for *Water Chemistry*:
http://global.oup.com/us/companion.websites/9780199730728/

III. Student Performance and Work

The plus/minus grading system applies in this course (e.g., possible "B" grades are: B+, B, and B-).

Student performance will be evaluated as follows:
a) Two quizzes in class (15%)
b) Homework assignments (50%)
d) Final exam: 20%
e) Class participation (15%)

Make-up quizzes will not be granted for any reason; students must take the quizzes on the scheduled dates.

Students are encouraged to actively participate in each lecture, through questions, discussion, and written assignments. Class periods will often include short, written assignments that are completed and turned in during lecture.

IV. Course Outline
Complete the assigned readings before lecture.

Week; Lecture Dates (Lecture number)	**Reading**	**Topics**
1; 1/12, 1/14(1, 2)	Assigned reading 1	Introduction and Overview Inorganic Composition of Natural Waters The Thermodynamic Basis for Equilibrium Chemistry
2; 1/19, 1/16 (3, 4)	Assigned reading 3	The Thermodynamic Basis for Equilibrium Chemistry
3; 1/26, 1/28 (5,6)	Assigned reading 4	Activity-Concentration Relationships
4; 2/2, 2/7 (7-8)	Assigned reading 5	Fundamentals of Kinetics
5; 2/9, 2/11 (9,10)	Assigned reading 5	Fundamentals of Kinetics
6; 2/16, 2/18 (11,12)	Assigned reading 7	Solving Ionic Equilibrium Problems
7; 2/23, 2/25 (13,14)	Assigned reading 8	Solving Ionic Equilibrium Problems Acid-Base Systems **Quiz #1: 2/25**
8; 3/1, 3/3(15,16)		Acid-Base Systems
9; 3/8, 3/10 (17,18)	Assigned reading 9	Complexation Reactions and Metal Ion Speciation
10; *No lecture this week*		*Spring break*
11; 3/22, 3/24 (19,20)		Complexation Reactions and Metal Ion Speciation
12; 3/29, 3/31 (21, 22)	Assigned reading 10	Solubility: Reactions of Solid Phases with Water
13; 4/5, 4/7 (23,24)		Solubility: Reactions of Solid Phases with Water
14; 4/12, 4/14 (25,26)	Assigned reading 11	Redox Equilibria and Kinetics **Quiz #2: 4/14**
15; 4/19, 4/21 (27,28)		Redox Equilibria and Kinetics
16; 4/26, 4/28 (29,30)		Special topics and review
17; Final Exam Week		*Final exam period scheduled by the Registrar's Office*

Any student who needs an accommodation based on the impact of a disability should contact Graduate Faculty Member to discuss specific needs. Please contact the Disability Resource Center in room 830 Young Hall to coordinate reasonable accommodations for students with documented disabilities.

I. **Academic dishonesty**
Dishonest conduct as defined in Sections B.2.1 and B.2.2 of the University Regulations will be reported to the Dean of Students. Other penalties will also apply, depending on the nature of the misconduct.

Excerpt from the Purdue University policy:
Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples ofdishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

Please also refer to Purdue's student guide for academic integrity: https://www.purdue.edu/odos/academic-integrity/

II. **Emergency Planning**

Purdue's policy:
"In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. <u>You are expected to read your @purdue.edu email on a frequent basis."</u>

This syllabus is subject to change. The most current version will be posted on the course website on Blackboard.