Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

EFD 40-13

DEPARTMENT Environmental and Ecological Engineering

EFFECTIVE SESSION Fall 2013 (201410)

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

- [X] 1. New course with supporting documents
- [ ] 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 (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	EEE	Subject Abbreviation	
Course Number	35000	Course Number	
Long Title	Environmental Engineering		
Short Title	Environmental Engineering		

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 [X] Summer

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

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 [ ]

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. Fees: [ ] Coop [ ] Lab [ ] Rate Request
   Include comment to explain fee
6. Registration Approval Type
   Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
CE 35000

RECEIVED
MAY 15 2013
OFFICE OF THE REGISTRAR

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required. Prerequisites: CHM 11600 or CHM 13600 or CHM 12600 or CHM 12400 or CHM 11000 or [CHEM C1020 and CHEM C1220] or [CHEM C1060 and CHEM C1260].

*COURSE LEARNING OUTCOMES:
(1) An ability to apply material balance tools to environmental systems; (2) an ability to describe the different types of air, soil, and water pollutants and how they affect environmental quality on a local or global scale; (3) an ability to explain the principles of water, wastewater, air, soil, and hazardous waste treatement processes; (4) an ability to describe the professional and ethical responsibility of engineers in the context of environmental management; and (5) an ability to describe the key roles and responsibilities of public institutions and private organizations in managing environmental resources.

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 Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date

West Lafayette Registrar — Date 5/21/13

OFFICE OF THE REGISTRAR

Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

DEPARTMENT Environmental and Ecological Engineering

EFFECTIVE SESSION Fall 2013 (201410)

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

- [X] 1. New course with supporting documents
- [ ] 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 (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	EEE	Subject Abbreviation	
Course Number	35500	Course Number	
Long Title	Engineering Environmental Sustainability		
Short Title	~~Engr Environ Sustain~~ Eng Env Sustainability		

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 [X] 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 [ ]

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. Fees: [ ] Coop [ ] Lab [ ] Rate Request
Include comment to explain fee
6. Registration Approval Type
Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
CE 35500

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts.
Restriction: sophomore standing or above. *NOTE: CHANGE IS ADDITION OF CROSS-LISTING OF EEE 35500 WITH THIS COURSE*

*COURSE LEARNING OUTCOMES:

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 Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	1/28/13 Date	West Lafayette College/School Dean	5/13/13 Date
		West Lafayette Registrar	6/3/13 Date

OFFICE OF THE REGISTRAR

5/22/13

Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

EFD 40-13

DEPARTMENT Civil Engineering

EFFECTIVE SESSION Fall 2013 (201410)

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

- [ ] 1. New course with supporting documents
- [ ] 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 (department head signature only)
- [ ] 8. Change in instructional hours
- [x] 9. Change in course description
- [ ] 10. Change in course requisites
- [x] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	CE	Subject Abbreviation	CE
Course Number	35000	Course Number	35000
Long Title	Environmental Engineering		
Short Title	Environmental Engineering		

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 [x] Summer

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

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 [ ]

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. Fees: [ ] Coop [ ] Lab [ ] Rate Request
   Include comment to explain fee
6. Registration Approval Type
   Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
EEE 35000

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required. Prerequisites: CHM 11600 or CHM 13600 or CHM 12600 or CHM 12400 or CHM 11000 or [CHEM C1020 and CHEM C1220] or [CHEM C1060 and CHEM C1260]. *NOTE: CHANGE IS ADDITION OF CROSS-LISTING OF EEE 35000 WITH THIS COURSE*

*COURSE LEARNING OUTCOMES:

(1) An ability to apply material balance tools to environmental systems; (2) an ability to describe the different types of air, soil, and water pollutants and how they affect environmental quality on a local or global scale; (3) an ability to explain the principles of water, wastewater, air, soil, and hazardous waste treatement processes; (4) an ability to describe the professional and ethical responsibility of engineers in the context of environmental management; and (5) an ability to describe the key roles and responsibilities of public institutions and private organizations in managing environmental resources.

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 Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	03/06/13 Date	West Lafayette College/School Dean	5/13/13 Date
		West Lafayette Registrar	5/21/13 Date

OFFICE OF THE REGISTRAR

Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

DEPARTMENT Civil Engineering

EFFECTIVE SESSION Fall 2013 (201410)

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

- [ ] 1. New course with supporting documents
- [ ] 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 (department head signature only)
- [ ] 8. Change in instructional hours
- [x] 9. Change in course description
- [ ] 10. Change in course requisites
- [x] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:	EXISTING:
Subject Abbreviation ~~CE~~	Subject Abbreviation CE
Course Number ~~35500~~	Course Number 35500
Long Title Engineering Environmental Sustainability	
Short Title Engr Environ Sustain	

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 [x] Summer

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

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 [ ]

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. Fees: [ ] Coop [ ] Lab [ ] Rate Request
Include comment to explain fee
6. Registration Approval Type: Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
EEE 35500

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts.
Restriction: sophomore standing or above. *NOTE: CHANGE IS ADDITION OF CROSS-LISTING OF EEE 35500 WITH THIS COURSE*

*COURSE LEARNING OUTCOMES:

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 Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	03/06/13 Date	West Lafayette College/School Dean	Date
		West Lafayette Registrar	6/3/13 Date

OFFICE OF THE REGISTRAR

5/22/13

CE 35000

TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Civil Engineering and the Faculty of the Division of Environmental and Ecological Engineering

RE: Cross-listing of two courses: conversion of CE 35000 to CE 35000/EEE 35000 and CE 35500 to CE 35500/EEE 35500

The Academics Committee of the Division of Environmental and Ecological Engineering has approved the establishment of two new course numbers, EEE 35000 and EEE 35500, and the permanent cross-listing of these courses with the existing courses CE 35000 and CE 35500, respectively. The Faculty of the School of Civil Engineering are in support of the creation of the new course numbers, and have approved the permanent cross-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.

EEE 35000 **Environmental Engineering**
Terms offered 1,2,3, Lecture 3, Cr. 3.
Cross-listed with CE 35000 Environmental Engineering
Pre-requisites: CHM 11600 or CHM 13600 or CHM 12600 or CHM 12400 or CHM 11000 or [CHEM C1020 and CHEM 1220] or [CHEM C1060 and CHEM 1260]

Description: Introduction to water pollution, air pollution, noise, hazardous and solid wastes, and their control. Environmental impact statements and global pollution issues. Field trips required.

EEE 35500 **Engineering Environmental Sustainability**
Terms offered 1,2,3, Lecture 3, Cr. 3.
Cross-listed with CE 35500 Engineering Environmental Sustainability
Pre-requisites: Sophomore standing or higher.

Description: An introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts.

Reason: We are seeking the cross-listing of these courses for two reasons: (1) These two courses are required for the new BSEEE degree as part of the EEE Core (they are not specifically required in Civil Engineering). We believe that it is important for accreditation that all courses in the EEE core be offered or cross-listed with EEE

CE 35000

course numbers. The cross-listing will provide EEE the ability to ensure that the courses will be offered at least frequently enough to meet the needs of the BSEEE students. The EEE core consists of seven classes: EEE 25000, EEE 30000, CE 35000, CE 35500, EEE 39000, EEE 43000, and senior design. (2) The faculty members who typically teach these courses are transitioning from a 100% appointment in Civil Engineering to a 50/50 joint appointment between CE and EEE. The courses are currently offered every semester and, in light of the faculty transfer, CE and EEE have agreed to share responsibility and provide equal resources (including TAs) toward the offering of the courses. It is therefore appropriate for the courses to be cross-listed.

Enrollments in these courses have been strong for several years: CE 35000 has been offered every fall and spring semester in recent memory, with an average of 123 students per semester. CE 35500 has been offered eight times in the past five years (and every semester since Spring 2010), with an average of 92 students per semester. Professors Blatchley, Hua, Jafvert, and Nies have taught CE 35000; Professors Nies and Blatchley have taught CE 35500. All four of these professors are transitioning to the 50/50 joint appointment between CE and EEE.

Submitted by:

John W. Sutherland
Fehsenfeld Family Head
Environmental and Ecological Engineering

Rao S. Govindaraju
Bowen Engineering Head
School of Civil Engineering

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

ECC Minutes #13
Date 5/10/2013
Chair, ECC

CE 350, Environmental Engineering, Spring 2012

Class Schedule: MWF 2:30-3:20 PM in MATH 175

Textbooks: James R. Mihelcic and Julie Beth Zimmerman (2010) *Environmental Engineering: Fundamentals, Sustainability, Design*, John Wiley & Sons, New York. ISBN: 978-0-470-16505-8.

Thomas Easton (2011) *Taking Sides: Clashing Views on Environmental Issues, 14th Edition (Expanded)*, McGraw-Hill, New York, ISBN: 978-0-07-351448-2.

Instructor: E.R. Blatchley III CIVL 2129 e-mail = blatch@purdue.edu

Teaching Assistants:
ShihChi Weng e-mail = sweng@purdue.edu
Mehrnaz Zare Afifi e-mail = mzareafi@purdue.edu
Robert W. Staton e-mail = rstaton@purdue.edu

Office Hours

Blatchley	Thursday 9:00 AM - noon	CIVL 2129
Staton	Thursday 1:00-3:00 PM	CIVL 4144
Weng/Afifi	Friday 9:00-11:00 AM	CIVL 4144

Course Grade: 3 exams = 65%; homework = 25%; quizzes = 10%

Exam #1	2/9/12	8:00-9:00 PM	LILLY 1105
Exam #2	3/27/12	8:00-9:00 PM	LILLY 1105
Exam #3	Finals week (time and place TBA)		

Course grades will be determined by statistics, as applied to the composite semester score (weighted as described above). The specific breakdown of semester grades will be based on the mean and standard deviation of the semester composite scores (Score = student semester composite score; X = mean of semester composite scores; SD = standard deviation of semester composite scores) as follows:

Semester Grade	Composite Score Range
A+	$\text{Score} \geq X + 1.85 \cdot SD$
A	$X + 1.15 \cdot SD \leq \text{Score} < X + 1.85 \cdot SD$
A-	$X + 1.00 \cdot SD \leq \text{Score} < X + 1.15 \cdot SD$
B+	$X + 0.85 \cdot SD \leq \text{Score} < X + 1.00 \cdot SD$
B	$X + 0.15 \cdot SD \leq \text{Score} < X + 0.85 \cdot SD$
B-	$X \leq \text{Score} < X + 0.15 \cdot SD$
C+	$X - 0.15 \cdot SD \leq \text{Score} < X$
C	$X - 0.85 \cdot SD \leq \text{Score} < X - 0.15 \cdot SD$
C-	$X - 1.00 \cdot SD \leq \text{Score} < X - 0.85 \cdot SD$
D+	$X - 1.15 \cdot SD \leq \text{Score} < X - 1.00 \cdot SD$
D	$X - 1.85 \cdot SD \leq \text{Score} < X - 1.15 \cdot SD$
D-	$X - 2.00 \cdot SD \leq \text{Score} < X - 1.85 \cdot SD$
F	$X < 2.00 \cdot SD$

An illustration of this grading scheme is provided on the next page for a situation in which X = 80 and SD = 10. **Please note that it is extremely unlikely that the values of X and SD for this class will be 80 and 10, respectively. Note also that the grading scheme will be no more severe than the commonly used distribution of 90, 80, 70, etc. (A, B, C, etc.).**

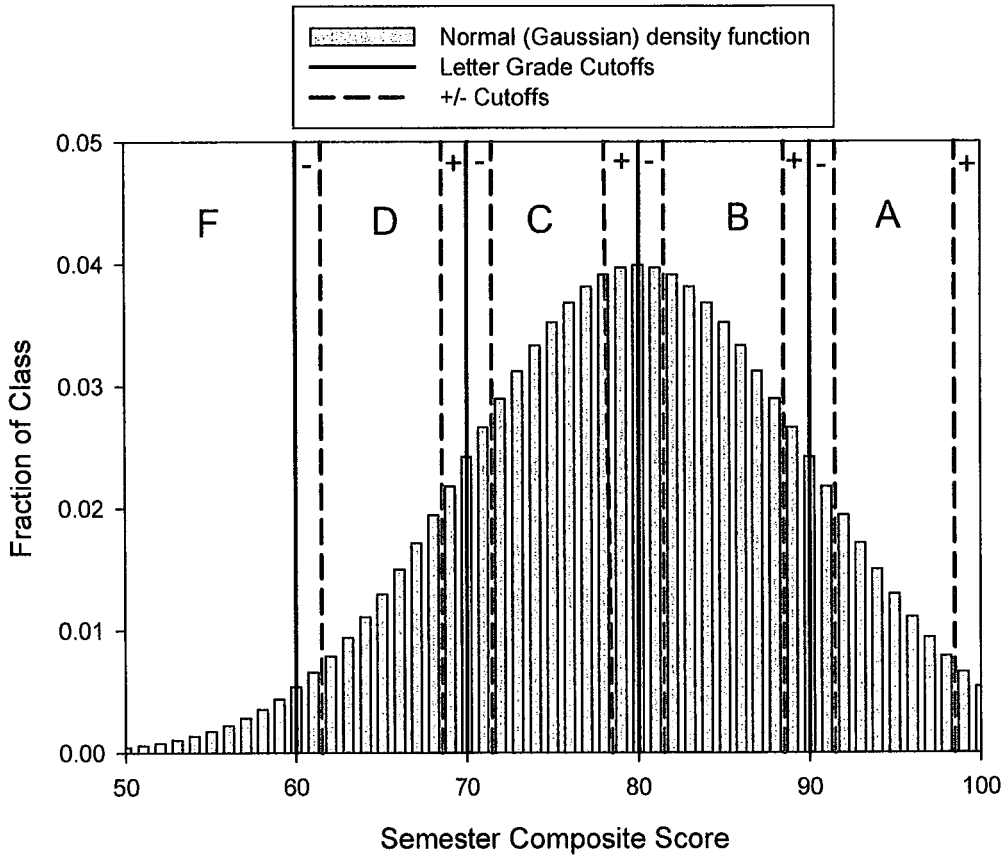
Homework assignments will be given in class on (roughly) a weekly basis. Normally, assignments will be given in class on Fridays and will be due the following Friday. Assignments are due in class at the **beginning** of lecture. Class assignments turned in late will be penalized 10% per day or fraction thereof. Exceptions to this rule will be made only by previous consent of the instructor. Grade appeals on exams and written assignments must be made to the instructor within

one week of the assignment's return to you with the original grade. Solutions to homework assignments, quizzes, and exams will be posted as soon as possible after their due date or time of completion. Attendance in class is not recorded, but students will be responsible for all material presented in class, assigned readings, and homework assignments. Subjects to be covered by quizzes will be pre-announced. Quizzes will be given in class (no opportunities for make-up), usually on Fridays, and will be brief (5 minutes). Two evening exams are scheduled (see above). Re-scheduling of exams is permitted only by prior consent of the instructor. If you have a conflict with an exam time/date, it is your responsibility to inform the instructor of the conflict at least 1 week in advance of the scheduled exam time/date.

During the semester, we will take 1-2 field trips. These excursions will be to facilities that are relevant to the class and your understanding of the material being presented. Attendance on field trips is strongly recommended; material covered on the field trip(s) will be helpful in class assignments, including homework, quizzes, and exams.

Semester Grade Assignments If:
Mean Composite Score = 80
Standard Deviation of Composite Scores = 10

Please Note: This is for illustration purposes only! Actual grade assignments will be based on the mean and standard deviation of the semester composite scores.



On the following page is a ***tentative*** schedule of lectures, topics, reading assignments, exams, etc. for the Spring 2012 semester. We may deviate from this schedule to allow time for additional exploration of a topic, or for incorporation of topics that may become relevant. Reading assignments that support lecture topics for the class are indicated in the column entitled "Mihelcic and Zimmerman Reading Assignment". We will also explore several environmental issues, many of which are controversial. Reading assignments for these topics are defined in the column entitled "Easton Reading Assignment". The motivation for including these topics in the class is to provide an opportunity for students to gain some exposure to contemporary environmental issues, and to prompt in-class discussions/debates. These topics/questions will be "fair game" for quizzes and exams; most quizzes will be based on these readings.

Date	Area/Topic	Mihelcic and Zimmerman Reading Assignment	Easton Reading Assignment
Jan 9	Course Introduction, Policies, Philosophy	**Chapter 1**: Engineering and Sustainable Development	**Issue 2**. Is Sustainable Development Compatible with Human Welfare?
Jan 11	Sustainability Definitions		
Jan 13	Sustainability Elements		
Jan 16	**Martin Luther King, Jr. Holiday, No Classes**		
Jan 18	Units of Concentration – Liquids	**Chapter 2**: Environmental Measurements	**Issue 7**. Should We Drill for Offshore Oil?
Jan 20	Units of Concentration – Gases and Solids		
Jan 23	Reaction Stoichiometry	**Chapter 3**: Chemistry	**Issue 16**. Should DDT Be Banned Worldwide?
Jan 25	Chemical Equilibria: Acid/Base, Gas/Liquid, Liquid/Solid		
Jan 27			
Jan 30	Reaction Kinetics		**Issue 5**. Should the Military Be Exempt from Environmental Regulations?
Feb 1	Advection, Diffusion, Dispersion	**Chapter 4**: Physical Processes	
Feb 3	Material Balances		
Feb 6	Groundwater Motion: Darcy's Law		
Feb 8	Particle Motion in Fluids: Stokes Law		**No Quiz Feb 10!**
Feb 9	**Exam #1, LILLY 1105, 8:00-9:00 PM**		
Feb 10	Population Dynamics	**Chapter 5**: Biology	
Feb 13	Oxygen Demand (BOD, COD)		**Issue 11**. Are Biofuels Responsible for Rising Food Prices?
Feb 15	Elemental Cycles		
Feb 17	Risk Perception and Assessment	**Chapter 6**: Environmental Risk	
Feb 20	Example: Water Quality Standards		**Issue 1**. Is the Precautionary Principle a Sound Approach to Risk Analysis?
Feb 22	DO Sag Curve: Streeter-Phelps	**Chapter 8**: Water Quality	
Feb 24	**No Class. Evening Exam Make-Up.**		
Feb 27	Surface Water Quality		**Issue 12**. Is It Time to Revive Nuclear Power?
Feb 29	Ground Water Quality	**Chapter 10**: Water Treatment	
Mar 2	Drinking Water Standards		
Mar 5	Particle Separation		**No Quiz!**
Mar 7	Disinfection, Softening		
Mar 9	**No Class. Evening Exam Make-Up.**		
Mar 12-16	**Spring Break**		
Mar 19	Wastewater Characteristics and Standards	**Chapter 11**: Wastewater Treatment	**Issue 17**. Do Environmental Hormone Mimics Pose a Potentially Serious Health Threat?
Mar 21	Preliminary, Primary Treatment		
Mar 23	Secondary Treatment		
Mar 26	Nutrient Removal, Disinfection, and Sludge Management		**Issue 6**. Will Restricting Carbon Emissions Damage the U.S. Economy?
Mar 27	**Exam #2, Lilly 1105, 8:00-9:00 PM**		
Mar 28	Air Pollutants and Their Effects	**Chapter 12**: Air Resources Engineering	
Mar 30	Indoor Air Pollution		
Apr 2	Regional Air Quality Problems		**Issue 21**. Is Global Warming a Catastrophe that Warrants Immediate Attention?
Apr 4	Air Pollution Control Devices		
Apr 6	Global Warming/Climate Change	**Supplementary Reading**	
Apr 9	Definitions and Regulations	**Chapter 13**: Solid-Waste Management	**Issue 18**. Is the Superfund Program Successfully Protecting Human Health from Hazardous Materials?
Apr 11	Landfills		
Apr 13	Hazardous Waste Management		
Apr 16	Pollution Prevention	**Chapter 7**: Green Engineering	**Issue 10**. Should Cars Be More Efficient?
Apr 18	Design for the Environment		
Apr 20	Case Study: Personal Computers in Washington (state)		
Apr 23	Materials	**Chapter 14**: Built Environment	**No Quiz. Dead Week.**
Apr 25	End of Life – Demolition		
Apr 27	LEED		
Apr 30 – May 5	**Exam #3, Date/Time TBD**		

In the event of a major campus emergency, course requirements, deadlines and grading procedures are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Information about these changes to this class will be communicated by e-mail and through the class web site on blackboard.

CE 35500

CE 355: Engineering Environmental Sustainability

Professor:
Larry Nies
Office: Civil 3145C
Phone: 494-8327
Email: nies@purdue.edu
Office Hours: by appointment

Course Information
Spring, 2013
Class Meetings: M,W,F 2:30-3:20pm
Classroom: Hicks B848
Course Website: Blackboard Learn
Prerequisite: Sophomore standing

Graduate Teaching Assistant:
Lindsey Payne
Office Hours: by appointment
Email: paynel@purdue.edu

Guest Lecturer:
Diana Bairaktarova
School of Engineering Education
Email: dbairakt@purdue.edu

Peer Teaching Assistants:
Spencer Evans, Lauren Kennedy, Dianne J Kaminsky, Rachel Levine, and Rebekah Steele
Note: Please contact Dr. Nies and Lindsey Payne only regarding course-related questions. Peer teaching assistants are not to be contacted via email, Facebook, or other electronic form of communication.

Course Description:
This course provides an introduction to the examination of global-scale resource utilization, food, energy and commodity production, population dynamics, and their ecosystem impacts. The global human population is expected to reach approximately 9 billion by the year 2050. If you consider defining "wealth" as the level at which all your basic needs are met—basic human needs are food, water, housing, health care, clothing, education, transportation, and security—most people would agree that everyone on earth should be wealthy. Globalization will potentially provide increasing access to wealth for more people. However, the consequences of creating wealth – as defined above – for everyone could result in unprecedented additional stress on already overburdened ecosystems.

Human existence requires the consumption of water, food, energy, and the utilization of space and raw materials. These activities have interrelated societal, political, economic, and environmental effects. It is apparent that humans have the ability to degrade the global environment to the extent that the earth's biosphere could conceivably be unable to produce the resources needed to indefinitely sustain the people of industrialized nations at their current standard of living. Moreover, additional resources must be developed to improve the standard of living of ~75% of the world's population who are not "wealthy." At what level of resource utilization and global population is an indefinitely sustainable society possible? Sustainable Engineering could become the great new discipline of the millennium! In this course, focused on student-centered learning, students will address current industrialized nation's practices, as well as those of developing nations, within the context of creating an environmentally sustainable society by actively engaging in the curriculum and utilizing critical thinking skills.

Course Outline:

Units & Assessments	Points*	Date Assigned
A) Framing Sustainability	100	Week 1,2,3
B) Food	75	Week 4,5
C) Water	125	Week 6,7,8
D) Energy	250	Week 10,11,12
E) Urbanization & the Future of Sustainability	350	Week 13,14,15
G) Take-Home Final Exam	100	Week 16
Total	1000	

*The point distribution may be modified slightly. However, please note that knowledge and information acquired in units A – D will be carried forward and applied in unit E.

Within each unit students will work on team activities and individually be responsible for quizzes and writing assignments.

CE 35500

CE 355: Engineering Environmental Sustainability

Creative Thinking Learning Outcome

1.1 Students will be creative thinkers that can **collect and analyze** appropriate data and information, and perform necessary quantitative analysis to **develop original and innovative** management strategies for real-world sustainability problems.

1.2 Students will be able to individually and in teams **skillfully communicate** in writing, orally, and with multimedia their ideas and conclusions about managing sustainability issues in a manner that increases knowledge and understanding of the audience.

Major Learning Objectives for Creative Thinking

1.1a. Students will be able to appropriately frame sustainability questions to reveal the quantitative information needed to solve the problem.

1.1b. Students will be able to summarize results of quantitative analysis to create novel approaches for managing sustainability issues.

1.1c. Students will be able to synthesize interdisciplinary knowledge to envision a sustainable future.

1.1d. Students will be able to challenge "business as usual" thinking with divergent, logical, and original proposals for sustainability.

1.2a. Students will illustrate their ideas in a concise, organized and responsive manner.

1.2b. Students will integrate diverse credible sources of information to create strategies to sustainably manage resources.

1.2c. Students will be able to communicate their conclusions about sustainably managing water, energy, and land resources in a creative, well-organized, logical manner.

Critical Thinking Learning Outcome

2.1 Students will be critical thinkers that can identify the **environmental, social, political, and economic dimensions** of technical challenges and **evaluate their own and others' perspectives** in forming logical opinions and conclusions.

2.2 Students will be able to effectively identify information needs, efficiently acquire appropriate information, and **critically evaluate and use it in an ethical and scholarly fashion** to gain understanding of and communicate about sustainability issues, challenges, and strategies.

Major Learning Objectives for Critical Thinking

2.1a. Students will be able to identify the interconnectivity between environmental, social, political, and economic issues surrounding technical solutions.

2.1b. Students will be able to describe the linkages between land, water, energy, and material resources.

2.1c. Students will be able to explain how discrete systems interact within larger natural and engineered interdependent systems.

2.1d. Students will be able to discuss how different perspectives, their own included, are applied to sustainability dilemmas.

2.1e. Students will compare the consequences of alternative ethical frameworks.

2.2a. Students will be able to evaluate conflicting information in the context of sustainability.

2.2b. Students will produce scholarly products that demonstrate proficient information literacy skills.

2.2c. Students will be able to assess strategic opportunities for change (economic, social, political, engineer, personal, etc.) that are in congruence with globalization, urbanization, and a sustainable future.

CE 355: Engineering Environmental Sustainability

Global Citizenship and Social Awareness Learning Outcome

3.1 Students will become global citizens and socially aware by gaining knowledge of **diverse international and cultural perspectives** and display **social responsibility and leadership** in managing sustainability issues, ultimately increasing their global literacy.

3.2 Students will learn how to be a **productive team member**, constructively evaluate their own and others' performances, resolve conflicts effectively and encourage the willing contributions of everyone.

Major Learning Objectives for Global Citizenship and Social Awareness

3.1a. Students will be able to engage others of different cultural experiences, beliefs, and values in the exploration of the intercultural dimensions of sustainability issues.

3.1b. Students will be able to transform their approaches for considering sustainability issues by integrating knowledge of diverse cultural perspectives.

3.1c. Students will gain a sense of responsibility for civic engagement in solving sustainability issues.

3.2a. Students will be able to successfully adapt to the varied skills, talents, abilities, learning styles, and work strategies of their teammates.

3.2b. Students will be able to develop project deliverables that demonstrate cohesive team functionality.

3.2c. Students will be able to constructively evaluate their own and others contributions to the overall success of the team.

Required Texts:

There is no textbook required for this course. Readings will be assigned as needed.

Policies:

Communication-

Do not hesitate to ask for my assistance. I enjoy teaching and am eager to help you. Contact me by e-mail or after class so we can arrange a time to discuss any questions you have about the course. Responses to email will occur within a reasonable time period (~36 hours). If no response is received, check with Professor Nies to confirm receipt of your email. Students should not depend on immediate responses to email, especially when assignment submission deadlines are imminent. Plan ahead.

You are required to read your @purdue.edu email on a daily basis.
You may use electronic devices in class for only CE 355 class work.

In class expectations-

Class sessions will entail group work, open discussion and lecture formats. Respect and courtesy for others is expected, which includes listening to whoever has the floor. Advance preparation and in class participation will be required frequently and deficiencies will result in assignment score reduction.

Assignment Submissions-

If you are unable to complete an assignment on time contact the instructor **in advance**. Occasionally an assignment specific extension may be granted but normally score reductions of 5% per late day will be imposed.

All assignments given in advance of class must be completed with a word processor to ensure readability. All electronic submission must be an editable text file (no Adobe pdf documents accepted) so comments and suggestions can be inserted. Hand written work will only be accepted for assignments which are completed in-class.

Attendance-

Classroom attendance, advanced preparation and in-class participation by students enrolled in CE 355 is needed to accomplish the objectives of this course. We will use a "Responsible Adult Attendance" policy in this course. If you are sneezing, coughing or contagious in any way – DO NOT ATTEND CLASSES! Students who miss class due to illness must complete homework, quizzes, and assignments in a timely manner to the extent that is

reasonable. Be a responsible person and stay home when you are ill. **In order to obtain an excused absence inform Professor Nies and Lindsey Payne by email prior to the beginning of the class period.** Good communication with your team members is also essential. In-class activities, quizzes, peer evaluations and other methods will be used to record participation and contributions. The consequences of poor preparation, participation and contributions will be lower scores on assignments. Excessive unexcused absences from class will result in point deductions from your semester score proportional to the frequency of unexcused absences. Make-up work will be allowed for excused absences only.

Students arriving late should minimize disruption to the class. Excessive instances of tardiness are not acceptable and will result in point deductions from your semester score proportional to the frequency. Students need to make arrangements to be in class on time on a regular basis. Inform Professor Nies and Lindsey Payne in advance if you know you will be late or must leave class early. The "Responsible Adult Attendance" policy applies to tardiness as well.

Missing more than 10% of CE 355 through absences and tardiness is too much. There are 44 class days of 50 minutes each. You do the math.

Ethics-
All students are expected to act in an honest and ethical manner consistent with Purdue University regulations. It is your responsibility to read "Academic Integrity: A Guide for Students" http://www.purdue.edu/odos/osrr/academicintegritybrochure.php. The consequences for acts of academic dishonesty will range from punitive grade reduction to course failure. Specifically, students should understand the definition of plagiarism. **The information on plagiarism at the link below is required reading**: http://gervaseprograms.georgetown.edu/honor/system/53377.html

Teamwork-
A significant part of this course will involve working in teams and improving your teamwork skills. You are responsible for contributing to your team and working with your peers to enhance your collective learning experience. You will be required to complete peer and self-evaluations periodically throughout the semester. Failure to complete the evaluations will result in a 100% deduction for the work completed during the evaluation period. Moreover, your individual score could be positively or negatively affected by the consensus evaluations of your peers.

Grading:

Grade	Numerical Score
A	≥94
A-	≥90
B+	≥86
B	≥82
B-	≥78
C+	≥74
C	≥70
C-	≥66
D+	≥62
D	≥58
D-	≥54

CE 355: Engineering Environmental Sustainability

Performance criteria:

A, A-	A consistently excellent performance in which the student clearly demonstrates a superior understanding of the course material. An outstanding student will have the ability to integrate and organize information and ideas from multiple sources and synthesize creative and innovative new concepts. Students who earn excellent scores will consistently complete pre-class preparation when expected, attend class, participate in discussion, contribute substantially to group effort, and submit superior and logically organized work.
B+, B, B-	A consistently good to very good performance in which the student demonstrates a thorough understanding of the course material. A good to very good student will have the ability to integrate and organize information and ideas from multiple sources and synthesize new concepts. Students who earn good to very good scores will dependably complete pre-class preparation when expected, attend class, participate in discussion, contribute substantially to group effort, and submit thoughtful, neat, logically organized work.
C+, C, C-	An adequate to fair performance in which the student demonstrates a general understanding of the course material. A student performing at this level will have a moderate ability to critically evaluate information and ideas from multiple sources and synthesize new concepts. Students who earn fair scores will complete pre-class preparation when expected, attend class, participate in discussion, contribute substantially to group effort, and submit neatly organized work.
D+, D, D-	A fair to poor performance in which the student demonstrates minimal understanding of the course material. A student performing at this level will have a marginal ability to critically evaluate information and ideas from multiple sources and synthesize new concepts. Students who earn fair to poor scores will inconsistently complete pre-class preparation when expected, have unexcused class absences, poorly participate in discussion, contribute little to group effort, and submit carelessly organized work.
F	An inadequate performance.

General Course Information:

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.

Additional information about campus emergencies and resources is available to you at:
http://www.itap.purdue.edu/tlt/faculty/

Everyone should be familiar with their rights and responsibilities as members of the Purdue University community: http://www.purdue.edu/policies

This syllabus is subject to change. The most recent version will be maintained on the Blackboard course page.