

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

Print Form

Office of the Registrar
 FORM 40 REV. 5/11

DEPARTMENT Environmental and Ecological Engineering EFFECTIVE SESSION Fall 2016

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

- | | |
|---|---|
| <input checked="" type="checkbox"/> 1. New course with supporting documents | <input type="checkbox"/> 7. Change in course attributes (department head signature only) |
| <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 (department head signature only) |
| <input type="checkbox"/> 6. Change in course credit/type | <input type="checkbox"/> 12. Transfer from one department to another |

PROPOSED:

Subject Abbreviation EEE
 Course Number 45600
 Long Title Wastewater Treatment Processes
 Short Title Wastewater Treatment Processes

EXISTING:

Subject Abbreviation _____
 Course Number _____
 Long Title _____
 Short Title _____

TERMS OFFERED

Check All That Apply:

- Fall Spring Summer

CAMPUS(ES) INVOLVED

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> Calumet | <input type="checkbox"/> N. Central |
| <input type="checkbox"/> Cont Ed | <input type="checkbox"/> Tech Statewide |
| <input type="checkbox"/> Ft. Wayne | <input checked="" type="checkbox"/> W. Lafayette |
| <input type="checkbox"/> 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

COURSE ATTRIBUTES: Check All That Apply

- | | | | | |
|---|--------------------------|-------------------------------|-------------------------------------|-------------------------------------|
| 1. Pass/Not Pass Only | <input type="checkbox"/> | 6. Registration Approval Type | Department <input type="checkbox"/> | Instructor <input type="checkbox"/> |
| 2. Satisfactory/Unsatisfactory Only | <input type="checkbox"/> | 7. Variable Title | | <input type="checkbox"/> |
| 3. Repeatable | <input type="checkbox"/> | 8. Honors | | <input type="checkbox"/> |
| Maximum Repeatable Credit: | <input type="checkbox"/> | 9. Full Time Privilege | | <input type="checkbox"/> |
| 4. Credit by Examination | <input type="checkbox"/> | 10. Off Campus Experience | | <input type="checkbox"/> |
| 5. Fees: <input type="checkbox"/> Coop <input type="checkbox"/> Lab <input type="checkbox"/> Rate Request | | | | |
| Include comment to explain fee | | | | |

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	15	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
CE 45600

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Fundamental design principles and practice of wastewater treatment to prepare students for de-signing wastewater treatment systems. The major topics include design and construction process, preliminary treatment of wastewater, primary treatment, wastewater microbiology, secondary treatment, nitrogen removal, phosphorus removal, attached microbial growth, secondary settling, disinfection and post-aeration, tertiary treatment, and wastewater plant residuals management.

***COURSE LEARNING OUTCOMES:**

- 1) understand design principles and practice of wastewater treatment.
- 2) apply the knowledge to select the best process to treat wastewater.
- 3) design a wastewater treatment component or process to meet water quality goals.
- 4) critically review relevant literature or contemporary issues in wastewater treatment.

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 <u>3/10/16</u>	Vice Chancellor for Academic Affairs _____ Date <u>10/21/16</u>
West Lafayette Department Head _____ Date _____	West Lafayette College/School Dean _____ Date _____

West Lafayette Registrar _____ Date _____

OFFICE OF THE REGISTRAR

PURDUE UNIVERSITY

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

Print Form

Office of the Registrar
FORM 40 REV. 5/11

DEPARTMENT Civil Engineering

EFFECTIVE SESSION Fall 2016

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

- | | |
|---|---|
| <input type="checkbox"/> 1. New course with supporting documents | <input type="checkbox"/> 7. Change in course attributes (department head signature only) |
| <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 checked="" type="checkbox"/> 9. Change in course description |
| <input type="checkbox"/> 4. Change in course number | <input type="checkbox"/> 10. Change in course requisites |
| <input checked="" type="checkbox"/> 5. Change in course title | <input type="checkbox"/> 11. Change in semesters offered (department head signature only) |
| <input type="checkbox"/> 6. Change in course credit/type | <input type="checkbox"/> 12. Transfer from one department to another |

PROPOSED:	EXISTING:
Subject Abbreviation _____	Subject Abbreviation <u>CE</u>
Course Number _____	Course Number <u>45600</u>
Long Title <u>Wastewater Treatment Processes</u>	
Short Title <u>Wastewater Treatment Processes</u>	

TERMS OFFERED
Check All That Apply:

Fall Spring Summer

CAMPUS(ES) INVOLVED

<input type="checkbox"/> Calumet	<input type="checkbox"/> N. Central
<input type="checkbox"/> Cont Ed	<input type="checkbox"/> Tech Statewide
<input type="checkbox"/> Ft. Wayne	<input checked="" type="checkbox"/> W. Lafayette
<input type="checkbox"/> Indianapolis	

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

CREDIT TYPE		COURSE ATTRIBUTES: Check All That Apply	
1. Fixed Credit: Cr. Hrs. <input type="text" value="3"/>		1. Pass/Not Pass Only	<input type="checkbox"/>
2. Variable Credit Range: Minimum Cr. Hrs. <input type="text"/> To <input type="text"/> Or <input type="text"/> Maximum Cr. Hrs. <input type="text"/>		2. Satisfactory/Unsatisfactory Only	<input type="checkbox"/>
3. Equivalent Credit: Yes <input type="checkbox"/> No <input type="checkbox"/>		3. Repeatable	<input type="checkbox"/>
		Maximum Repeatable Credit: <input type="text"/>	
		4. Credit by Examination	<input type="checkbox"/>
		5. Fees: <input type="checkbox"/> Coop <input type="checkbox"/> Lab <input type="checkbox"/> Rate Request	
		6. Registration Approval Type	Department <input type="checkbox"/> Instructor <input type="checkbox"/>
		7. Variable Title	<input type="checkbox"/>
		8. Honors	<input type="checkbox"/>
		9. Full Time Privilege	<input type="checkbox"/>
		10. Off Campus Experience	<input type="checkbox"/>

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	15	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

EEE 45600

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Prerequisites: CE/EEE 35000 minimum grade of D-
Fundamental design principles and practice of wastewater treatment to prepare students for de-signing wastewater treatment systems. The major topics include design and construction process, preliminary treatment of wastewater, primary treatment, wastewater microbiology, secondary treatment, nitrogen removal, phosphorus removal, attached microbial growth, secondary settling, disinfection and post-aeration, tertiary treatment, and wastewater plant residuals management. Typically offered Fall.

*COURSE LEARNING OUTCOMES:

- 1) understand design principles and practice of wastewater treatment.
- 2) apply the knowledge to select the best process to treat wastewater.
- 3) design a wastewater treatment component or process to meet water quality goals.
- 4) critically review relevant literature or contemporary issues in wastewater treatment.



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 _____

OFFICE OF THE REGISTRAR

TO: The Faculty of the College of Engineering
FROM: The Faculty of the Lyles School of Civil Engineering and the Division of Environmental and Ecological Engineering
SUBJECT: Change of title of CE 45600; Creation of EEE 45600; and cross listing of these two courses as CE/EEE 45600

The Faculty of the Lyles School of Civil Engineering and the Division of Environmental and Ecological Engineering have approved the following course title and description change, creation of a new course and cross listing of these courses. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From CE 45600: Water and Wastewater Treatment

Sem. 1, Lecture 3, Credits 3

Pre-requisites: CE/EEE 35000 minimum grade of D-.

Course description:

Fundamental concepts and design procedures for the treatment of municipal and industrial water and wastewaters. Problem assessment; determination of water and wastewater characteristics, biological, physical, and chemical treatment methods, process design, and disposal of residues. Typically offered Fall.

To CE EEE 45600: Wastewater Treatment Processes

Sem. 1, Lecture 3, Credits 3

Pre-requisites: CE/EEE 35000 minimum grade of D-.

Course description:

Fundamental design principles and practice of wastewater treatment to prepare students for designing wastewater treatment systems. The major topics include design and construction process, preliminary treatment of wastewater, primary treatment, wastewater microbiology, secondary treatment, nitrogen removal, phosphorus removal, attached microbial growth, secondary settling, disinfection and post-aeration, tertiary treatment, and wastewater plant residuals management. Typically offered Fall.

Reasons:

In 2005 the course title and content was broadened to include water treatment. This requires coverage of too much content and the faculty wish to restore the focus of the course to only wastewater treatment. The proposed new courses have been taught twice with temporary course numbers as CE 49700/EEE 49500 and cross listing is requested to reflect the joint support of this course.

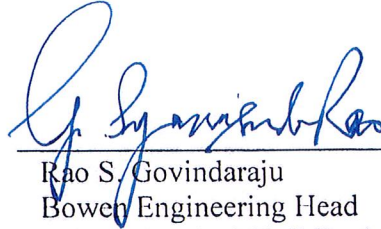
Learning Objectives:

Upon successful completion of the course, the students should be able to

- 1) understand design principles and practice of wastewater treatment.
- 2) apply the knowledge to select the best process to treat wastewater.
- 3) design a wastewater treatment component or process to meet water quality goals.
- 4) critically review relevant literature or contemporary issues in wastewater treatment.



John W. Sutherland
Fehsenfeld Family Head
Environmental and Ecological Engineering



Rao S. Govindaraju
Bowen Engineering Head
Lyles School of Civil Engineering

Approved for the faculty of the Schools
of Engineering by the Engineering
Curriculum Committee

ECC Minutes #3 Date 10-19-16
Chairman ECC [Signature]

Supporting Documentation (EFD 61-16)

WASTEWATER TREATMENT PROCESSES

INSTRUCTOR

Name: Assistant Professor Zhi (George) ZHOU, Ph.D., P.E.

Contact information: zhizhou@purdue.edu, telephone: (765) 496-3559, office: HAMP 2125

COURSE INFORMATION

Credit: 3

Prerequisite: CE35000 (Environmental Engineering) Minimum Grade of D-

Recommended text: The main contents will be from the following textbooks:

- *Water and Wastewater Engineering: Design Principles and Practice* by Mackenzie L. Davis. 2011. McGraw-Hill. ISBN-10: 0071713840. ISBN-13: 978-0071713849.
- *Wastewater Engineering: Treatment and Resource Recovery* by Metcalf & Eddy *et al.* 2013. McGraw-Hill. ISBN-10: 0073401188. ISBN-13: 978-0073401188.
- *Environmental Biotechnology: Principles and Applications* by Bruce Rittmann and Perry McCarty. 2000. McGraw-Hill. ISBN-10: 0072345535. ISBN-13: 978-0072345537.

Objectives: The objectives of this course are to introduce the fundamental design principles and practice of wastewater treatment and to prepare students for designing wastewater treatment systems. The major topics include design and construction process, preliminary treatment of wastewater, primary treatment, wastewater microbiology, secondary treatment, nitrogen removal, phosphorus removal, attached microbial growth, secondary settling, disinfection and postaeration, tertiary treatment, and wastewater plant residuals management.

Learning Outcomes: Upon successful completion of the course, the students should be able to

- 1) understand design principles and practice of wastewater treatment.
- 2) apply the knowledge to select the best process to treat wastewater.
- 3) design a wastewater treatment component or process to meet water quality goals.
- 4) critically review relevant literature or contemporary issues in wastewater treatment.

COURSE POLICIES

General policy: Students should follow policies, rules, and regulations of Purdue University as specified in http://www.purdue.edu/studentregulations/student_conduct/index.html. You are responsible to read and follow these codes.

Academic integrity: Cheating, fabrication, and plagiarism are **strictly prohibited** and can lead to zero in an assignment or other disciplinary actions. If you have any questions, please always ask me before you go ahead. A guide on academic integrity can be found in the following website: <http://www.purdue.edu/odos/aboutodos/academicintegrity.php>

Expectations of performance behaviors: You are expected to arrive in the class on time. You are encouraged to actively participate in class discussions and other class activities. If you have any questions during the class, please feel free to ask. Cell phones and other irrelevant communicating equipment should be switched to silence mode before class to prevent distractions to the class.

Attendance: If you cannot attend a certain class, please let me know as soon as you can.

Late policy: You are required to submit all assignments on the due dates. If you cannot submit a certain assignment on time, please contact me either BEFORE the due dates to seek an extension or after the due dates with supporting evidences for unexpected events. There will be a 10% penalty per day (including weekends) for late submissions if prior extension request is not submitted or an evidence is not provided.

Students with disabilities: If you are a disabled student or have other special requests, please feel free to contact me. Appropriate accommodations will be granted for students who register with Purdue Disability Resource Center (DRC), which is located in Young Hall, Room 830.

Emergencies and preparedness: *“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. You can get in touch with the instructor or TA for more information in such an event. Purdue University is a very safe campus and there is a low probability that a serious incident will occur here at Purdue. However, just as we receive a “safety briefing” each time we get on an aircraft, we want to emphasize our emergency procedures for evacuation and shelter in place incidents. Our preparedness will be critical if an unexpected event occurs. Emergency preparedness is your personal responsibility. Purdue University is continuously preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus. Some of the emergency procedures include:*

- *To report an emergency, call 911.*
- *To obtain updates regarding an ongoing emergency, and to sign up for Purdue Alert text messages, view www.purdue.edu/ea*
 - *There are nearly 300 Emergency Telephones outdoors across campus and in parking garages that connect directly to the Purdue Police Department (PUPD). If you feel threatened or need help, push the button and you will be connected immediately.*
 - *If we hear a **fire alarm**, we will immediately suspend class, **evacuate the building**, and proceed outdoors, and away from the building. **Do not use the elevator.***
- *If we are notified of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the lowest level of this building away from windows and doors.*
- *If we are notified of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in our classroom, shutting any open doors or windows, locking or securing the door, and turning off the lights.*
- *Please review the Emergency Preparedness website for additional information: http://www.purdue.edu/ehps/emergency_preparedness/index.html (source: Office of the Provost at Purdue University)*

ASSIGNMENTS AND GRADING

Course assessment will comprise:

Muddiest points:	10%
Mid-term:	20%
Homework:	30%
Project:	40%

- Muddiest points are one-sentence feedback to develop the reciprocity between students and faculty. They can be used to identify the areas for more explanations from all students in the classroom. They also provide you with a chance to ask questions or make suggestions.

Any questions, suggestions, or ideas are welcome. You will get full credit as long as you submit the muddiest points in class.

- A 50-minute mid-term exam will be given in the middle of the semester.
- Homework assignments are used to test your understanding of the course contents. Group discussion is encouraged, but you can't directly copy other students' answers.
- A group project will be due at the end of this semester. Details of the project will be distributed to the class after mid-term.

COURSE SCHEDULE

The course schedule is listed in the following table.

	<i>Date</i>	<i>Topic</i>	<i>Reading^d</i>
Week 1	08/24-8/28	Introduction	
Week 2	8/31-9/4	Wastewater Collection and Treatment Design Considerations	Chapter 12
Week 3	9/7-9/11 ^a	Preliminary Treatment of Wastewater	Chapter 13
Week 4	9/14-9/18	Wastewater Microbiology	Chapter 15
Week 5	9/21-9/25	Secondary Treatment: Conventional Activated Sludge	Chapter 16
Week 6	9/28-10/2	Secondary Treatment: Conventional Activated Sludge	Chapter 16
Week 7	10/5-10/9	Secondary Treatment: Conventional Activated Sludge	Chapter 16
Week 8	10/12-10/16 ^b	Mid-term	
Week 9	10/19-10/23	Secondary Treatment: Nitrogen Removal	Chapter 16
Week 10	10/26-10/30	Secondary Treatment: Phosphorus Removal	Chapter 16
Week 11	11/2-11/6	Secondary Treatment: Attached Microbial Growth	Chapter 17
Week 12	11/9-11/13	Secondary Settling	Chapter 18
Week 13	11/16-11/20	Disinfection and Postaeration	Chapter 18
Week 14	11/23-11/27 ^c	Tertiary Treatment	Chapter 19
Week 15	11/30-12/4	Wastewater Plant Residuals Management	Chapter 20
Week 16	12/7-12/12	presentation	

^a Labor day (9/7, no class)

^b October break (10/12-10/13, no class)

^c Thanksgiving vacation (11/25-28, no class)

^d Water and Wastewater Engineering: Design Principles and Practice by Mackenzie L. Davis. 2011.