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

DEPARTMENT: Environmental and Ecological Engineering
EFFECTIVE SESSION: Fall 2018

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
☐ 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:

Subject Abbreviation: EEE
Course Number: 45900
Long Title: Wastewater Treatment Processes
Short Title: Wastewater Treatment Processes

EXISTING:

Subject Abbreviation
Course Number

TERM OFFERED:
Check All That Apply:
☒ Fall  ☑ Spring  ☐ Summer

CAMPUS(ES) INVOLVED:
☒ Calumet
☐ N. Central
☐ Tech Statewide
☐ Ft. Wayne
☒ W. Lafayette

Abbreviated title will be entered by the Office of the Registrar if omitted. (20 CHARACTERS ONLY)

CREDIT TYPE:

1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range: Minimum Cr. Hrs. (Check One) To Or
   Maximum Cr. Hrs. Yes No

3. Equivalent Credit:

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Maximum Repeatable Credit:
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

Schedule Type
Lecture 50 3
Recitation
Presentation
Laboratory
Lab Prep
Studio
Distance
Clinic
Experiential
Research
Ind. Study
Prac/Observ

Minutes Per Week
Meetings Per Week
Weeks Offered
% of Credit Allocated

Cross-Listed Courses
CE 45800

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
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.

*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

Ft. Wayne Department Head
Date
Ft. 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 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)

DEPARTMENT: Civil Engineering
EFFECTIVE SESSION: Fall 2016

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/typology

☐ 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:

Subject Abbreviation: CE
Course Number: 45600
Long Title: Wastewater Treatment Processes
Short Title: Wastewater Treatment Processes

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) Maximum Cr. Hrs. To Or
3. Equivalent Credit: Yes No

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
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

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

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
Prerequisites: CE/EE 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

Vienna Central Faculty Senate Chair Date

Vice Chancellor for Academic Affairs Date

West Lafayette Department Head Date
West Lafayette College/School Dean 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  
Bower 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 10-18-16
Chairman EOC
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:

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.

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