TO: The Faculty of the College of Engineering
FROM: The Division of Environmental and Ecological Engineering
SUBJECT: New Undergraduate Course, EEE 47200, Community-Engaged Eng & Design

The Faculty of the Division of Environmental and Ecological Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

EEE 47200: Community-Engaged Engineering & Design
Sem. 2, Lecture 3, Credits 3
Prerequisites: no, Instructor permission required

Course description:
Utilizing a transdisciplinary approach in a real-world, client-based service-learning design experience, students will lead the design and implementation of community-engaged sustainability projects integrating not only their discipline-specific knowledge, but community partner and stakeholder knowledge as well. This course will require travel outside of class to community partner sites to collaborate in the design process. Sustainability projects to improve the health and wellness of communities will be implemented at multiple sites. The complex and dynamic relationships between social, economic, environmental, and political sectors in such community-engaged projects will be investigated.

This course has been taught has EEE 49500, Urban Water Projects every Spring semester since 2013 with the exception of 2015 and 2019.

Reasons: Service-learning course in the students' discipline that is very similar to consulting engineering position.

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John W. Sutherland, Professor and Fehsenfeld Family Head
Division of Environmental and Ecological Engineering

EEE 47200: Community-Engaged Engineering & Design (EFD 06-22)

Level: Undergraduate

Course Instructor: Lindsey Payne

Course Description & Pedagogical Approach
Utilizing a transdisciplinary approach in a real-world, client-based service-learning design experience, students will lead the design and implementation of community-engaged sustainability projects integrating not only their discipline-specific knowledge, but community partner and stakeholder knowledge as well. This course will require travel outside of class to community partner sites to collaborate in the design process. Sustainability projects to improve the health and wellness of communities will be implemented at multiple sites. The complex and dynamic relationships between social, economic, environmental, and political sectors in such community-engaged projects will be investigated.

Service-learning, a subset of service engagement, is a course-based, credit-bearing educational experience in which students: a) participate in an organized service activity that meets community-identified needs; b) use knowledge and skills directly related to a course or discipline; and c) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility. It differs from volunteerism, community service, internships, and field education through its use of structured critical inquiry and the importance placed on reciprocal partnerships between this class and its community partners.

Learning Outcomes & Learning Objectives
Students will be able to:
1. Display social responsibility, civic engagement, and leadership in addressing sustainability issues.
   a. Evaluate and apply diverse perspectives from multiple stakeholders to site-specific design solutions.
   b. Connect and extend academic knowledge to improve the health and wellness of communities.
   c. Take informed, responsible action to address ethical, social, and environmental challenges related to sustainability at partner sites.
   d. Communicate project efforts in a creative, well-organized, and logical manner.
2. Design novel, context-appropriate solutions to sustainability issues using a transdisciplinary knowledge production model.
   a. Describe the interconnectivity between environmental, social, political, and economic issues surrounding technical solutions.
   b. Apply a transdisciplinary knowledge production model.
   c. Propose solutions to open-ended design problems that demonstrate a deep comprehension of the issues.
3. Engage in the complexities of a negotiated design process occurring between multiple stakeholders in a professional and ethical manner.
   a. Demonstrate empathy and adaptability in working with teammates and stakeholders with varied skills, talents, abilities, and work strategies.
   b. Create project deliverables that demonstrate cohesive stakeholder functionality.
   c. Critically evaluate personal and others' contributions to the overall success of the projects.

Previous Teaching:
This course has been taught as EEE 49500, Urban Water Projects every Spring semester since 2013 with the exception of 2015 and 2019.

Enrollment Spring 2013 = 13
Enrollment Spring 2014 = 15
Enrollment Spring 2016 = 16
Enrollment Spring 2017 = 13
Enrollment Spring 2018 = 12
Enrollment Spring 2020 = 15
Enrollment Spring 2021 = 12

The syllabus for Spring 2020 follows.

EEE 49500: Urban Water Projects

Course Information
Semester: Spring 2020, 3 credits
Meeting times: M/W 4:30 PM – 5:45 PM
Meeting location: WALC 3121

Instructor: Dr. Lindsey Payne
Office: Office of Engagement, YONG 520
Office Hours: Fridays, 11:30 AM – 1:30 PM or by appointment
Contact: (949) 357-4514, paynel@purdue.edu

Course Description & Pedagogical Approach

Utilizing a transdisciplinary approach in a real-world, client-based service-learning design experience, students will lead the design and implementation of community-based urban water projects integrating not only their discipline-specific knowledge, but community partner and local stakeholder knowledge as well. This course will require travel outside of class to community partner sites to collaborate in the design process. Urban water projects to improve the health of the Wabash River will be installed at three local sites. The complex and dynamic relationships between social, economic, environmental, and political sectors in such community-based projects will be investigated.

Service-learning, a subset of service engagement, is a course-based, credit-bearing educational experience in which students: a) participate in an organized service activity that meets community-identified needs; b) use knowledge and skills directly related to a course or discipline; and c) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility. It differs from volunteerism, community service, internships, and field education through its use of structured critical inquiry and the importance placed on reciprocal partnerships between this class and its community partners.

Prerequisites

Instructor approval

Learning Outcomes & Learning Objectives

Students will be able to:
1. Display social responsibility, civic engagement, & leadership in addressing local water sustainability issues.
   a. Evaluate & apply diverse perspectives from multiple stakeholders to site-specific stormwater management design solutions.
   b. Connect & extend academic knowledge to improve the health of the Wabash River.
   c. Take informed, responsible action to address ethical, social, & environmental challenges related to stormwater management at partner sites.
   d. Communicate project efforts in a creative, well-organized, & logical manner.
2. Design novel, context-appropriate solutions to local stormwater sustainability issues using a transdisciplinary knowledge production model.
   a. Describe the interconnectivity between environmental, social, political, & economic issues surrounding technical solutions.
   b. Apply a transdisciplinary knowledge production model.
   c. Propose solutions to open-ended design problems that demonstrate a deep comprehension of the issues.
3. Engage in the complexities of a negotiated design process occurring between multiple stakeholders in a professional & ethical manner.
   a. Demonstrate empathy & adaptability in working with teammates & stakeholders with varied skills, talents, abilities, & work strategies.
   b. Create project deliverables that demonstrate cohesive stakeholder f
   c. Critically evaluate personal & others' contributions to the overall s

Course Assessments

A.	Presentations & Milestones	325 points
B.	Reflection	270 points
C.	Project Planning	255 points
D.	Facilitation	50 points
E.	Quizzes	50 points
F.	Participation	50 points
	Total	**1,000 points**

Individual
Grade %

54%

46%

Team
Grade %
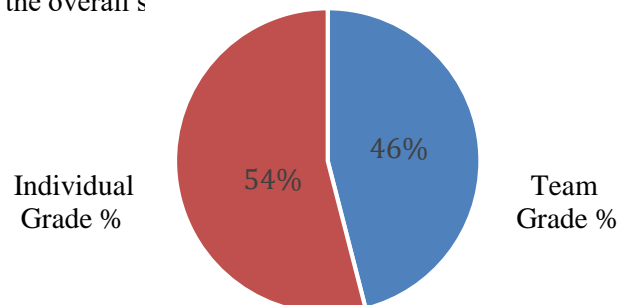
Required Texts

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

Class Schedule

To accomplish the objectives of this course a variety of instructional techniques will be used including, but not limited to: lectures, group discussion, reflective practice, informal/formal presentations. Ultimately, this is a student-centered learning course requiring high levels of engagement and responsibility from all students. Additional site visits not listed in the course outline may be required in order to complete projects and self/peer evaluations are mandatory in order to complete the course.

Dates	Activities	Assessment	Due Date
Jan-13	Course Expectations Overview of Projects & History of Stormwater Management	Consent Forms (3) Student Partnership Learning Contract & Pre-Course Assessment Read*: Syllabus; Stormwater Management & Green Infrastructure* Office Hours Personal Interview	In class Jan-15, 12:00 pm Jan-15, 12:00 pm Feb-3, 12:00 pm
Jan-15 QUIZ	Green Practices for Urban Watershed Management & the Wabash River Project Timelines, Roles, & Team Building	Team Building Read: *Executive Summary Wabash Survey;* Local BMPs; *Community Partner Information Sheet* Tour BMP Sites & Reflection Past Partner Maintenance Support • *Revised maintenance plan* • *Maintenance days*	Jan-22, 12:00 pm Jan-22, 12:00 pm Jan-27, 12:00 pm Mar-2, 12:00 pm May-4, 12:00 pm
Jan-20 Jan-22	MLK Day – No School Site Visits & Assessments Design Charrettes Prep Activity *Travel to Home with Hope, Lafayette Renew, and LINC*	 Read: *Participant Observation Primer* Site Assessment & SWOT Analysis Key Informant & Participant Observation & Reflection In-Kind Hours Spreadsheet (see Google Drive)	 Feb-12, 12:00 pm Feb-3, 12:00 pm Feb-12, 12:00 pm Ongoing
Jan-27 Jan-29	Design Charrette with Lafayette Renew (onsite) *No class Home with Hope and LINC teams* Design Charrette with Home with Hope and LINC (onsite) *No class Lafayette Renew team*	Read: *Rain Garden Manual; Conservation Practices Installation videos* Design Charrette Map & Reflection Lafayette Renew team Design Charrette Map & Reflection Home with Hope and LINC teams	Jan-29, 12:00 pm Feb-3, 12:00 pm Feb-3, 12:00 pm
Feb-3 Feb-5 QUIZ	The Broader Context—social, political, economic dimensions of watershed management *Ian Livers (Outside by Design, LLC)* Activist Engineer: Changing Engineering Practice Team Facilitation Overview & Sign-up	Read: *Percolation Test; Advice to Future Students; Activist Engineer* Read: *BMP Technical Fact Sheets (skim for reference); Rain Barrel Installation Guide; Tippecanoe Stormwater Technical Standards (chp. 6, skim rest for reference)* Team Facilitation & Report	Feb-5, 12:00 pm Feb-10, 12:00 pm Day of Facilitation
Feb-10 Feb-12 QUIZ	Project Management—Setting your Design Session Plans Design Session: Reviewing BMPs	Read: *WREC Implementation Cost-Share Grant; WREC Example Budget; Example Purdue SL Grant; Technical Writing Tips; Check out SketchUp on EEE computers* Milestone 1 Presentation & Proposal Read: *Stormwater Volume Calculator; Rain Garden Sizing Calculations*	Feb-12, 12:00 pm Feb-17, 12:00 pm Feb-17, 12:00 pm

Feb-17	Milestone 1 Project Presentation		
Feb-19	Team Facilitation Guest speaker *Shannon Stanis, WREC (Native Plants)*	Facilitation & Summary *(Summary presented at end of class)* Read: *Example Native Planting Guides (5); Plants Lists for BMPs; Example Native Plant Spacing; Native Plant Guide (skim); Spence Nursery Catalogue (reference); Plant List by Species Type (reference); Bioretention Plant List for Salt Tolerance (reference)*	Feb-19, 12:00 pm Feb-24, 12:00 pm
Feb-24 Feb-26 QUIZ	Design Session: Developing Holistic Design Solutions & Transdisciplinary Approaches *Cindy Landreth, Landscape Architect* Design Session: Budgeting & Load Reductions	Milestone 2 Presentation Milestone 2 Proposal	Mar-9, 12:00 pm Mar-11, 12:00 pm
Mar-2 Mar-4	Team Facilitation Guest speaker *TBA (Maintenance & Ownership)* *No Class (accounting for volunteer hours)*	Facilitation & Report *(Report presented at end of class)* Read: *Example Maintenance Plan; Example Common Weeds; Rain Barrel Winterization*	Mar-2, 12:00 pm Mar-4, 12:00 pm
Mar-9 Mar-11 QUIZ	Milestone 2 Project Presentation RAWLS 2058, Guests: *Invited external reviewers* Design Session: Installation, Plant Selection, & Phase II Debrief	Mid-Semester Self & Peer Team Evaluations Project Critical Reflection Read: *Example Installation Plan* Milestone 3 Presentation & Proposal	Mar-14, 12:00 pm Mar-14, 12:00 pm Mar-25, 12:00 pm Apr-6, 12:00 pm
Mar-16	*Spring Break*		
Mar-23 Mar-25	Mid-Semester Design Charrette, Matchbox (all partners) Design Session: Topic TBA		
Mar-30 Apr-1	Team Facilitation Guest speaker *TBA (Education & Outreach)* Design Session: Education & Outreach	Facilitation & Report *(Report presented at end of class)* Read: *Example Education Sign (3); Extension Education Plans*	Mar-30, 12:00 pm Apr-1, 12:00 pm
Apr-6 Apr-8	Milestone 3 Project Presentation Design Session: Final Presentation & Press Release *Note: Installations to occur between Apr-13 & Apr-26*	Read: *Example Presentation Materials (4)* Read: *Example Press Release* Final Presentation	Apr-8, 12:00 pm Apr-13, 12:00 pm Apr-27, 12:00 pm
Apr-13 Apr-15	Design Session: Scholarship of Engagement Design Session: Topic TBA	Scholarly Contribution & Reflection	Apr-29, 12:00 pm
Apr-20 Apr-22	Design Session: Final Proposal Sharing Your Successes & Elevator Pitches	Final Proposal Final Project Critical Reflection	May-2, 12:00 pm May-6, 12:00 pm
Apr-27 Apr-29	Final Project Presentation Practice & Preparation Final Project Presentation, TBD Course Wrap-Up & Lessons Learned (Download all team files from Google Drive)	Final Self & Peer Team Evaluations Review Final Community Partner Evaluation	Apr-29, 12:00 pm May-2, 12:00 pm
May-4	Final Exam Week		

Grading

Grade	Numerical Score
A	≥93
A-	≥90
B+	≥87
B	≥83
B-	≥80
C+	≥77
C	≥73
C-	≥70
D+	≥67
D	≥63
D-	≥60
F	Below 60

Course Policies

Communication: Do not hesitate to ask for my assistance. **Constant communication is critical in this course**. I love teaching, I am passionate about this subject matter, and Iam 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 (~24 hours).

Class Expectations: Class sessions will entail group work, open discussion, lectures, and travel to sites. Respect and courtesy for others is expected. Advance preparation and in class participation will be required frequently and deficiencies will result in assignment score reduction. As this is a real-world, experience with external community partners, high levels of participation are required for this course—active engagement with partners, teammates, and the instructor will be expected at all times.

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 submitted as a Microsoft Word document.

Attendance: Classroom attendance, regular meetings with community partners, and travel to sites are mandatory in order to accomplish the objectives of this course. I do acknowledge that this course involves constant evolving community relations and flexibility in schedules, so again, communication is key with me, your teammates, and your community partners. More than one absence from class and/or from meetings with community partners may result in point deductions from your semester score participation score.

General Course Policies

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 via email or phone.

Attendance: Students are expected to be present for every meeting of the classes in which they are enrolled. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts or absences can be anticipated, such as for many University sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible…For unanticipated or emergency absences when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, or by contacting the main office that offers the course. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, the student or the student's representative should contact the Office of the Dean of Students. The link to the complete policy and implications.

Academic Dishonesty: Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, Student 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], Purdue's student guide for academic integrity.

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

The Purdue Honor Pledge (https://www.purdue.edu/odos/osrr/honor-pledge/about.html):
"As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue"

Use of Copyrighted Materials: Students are expected, within the context of the Regulations Governing Student Conduct and other applicable University policies, to act responsibly and ethically by applying the appropriate exception under the Copyright Act to the use of copyrighted works in their activities and studies. The University does not assume legal responsibility for violations of copyright law by students who are not employees of the University. A Copyrightable Work created by any person subject to this policy primarily to express and preserve scholarship as evidence of academic advancement or academic accomplishment. Such works may include, but are not limited to, scholarly publications, journal articles, research bulletins, monographs, books, plays, poems, musical compositions and other works of artistic imagination, and works of students created in the course of their education, such as exams, projects, theses or dissertations, papers and articles, University Regulations on policies.

Nondiscrimination Policy: Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. Purdue's nondiscrimination policy can be found at http://www.purdue.edu/purdue/ea_eou_statement.html.

Diversity and Inclusion: In our discussions, structured and unstructured, we will explore a variety of challenging issues, which can help us enhance our understanding of different experiences and perspectives. This can be challenging, but in overcoming these challenges we find the greatest rewards. While we will design guidelines as a group, everyone should remember the following points:
- We are all in the process of learning about others and their experiences. Please speak with me, anonymously if needed, if something has made you uncomfortable.
- Intention and impact are not always aligned, and we should respect the impact something may have on someone even if it was not the speaker's intention.
- We all come to the class with a variety of experiences and a range of expertise, we should respect these in others while critically examining them in ourselves.

Grief Absence Policy for Students: Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for misses assignments or assessments in the event of the death of a member of the student's family. See the University's website for additional information.

Accessibility and Accommodations: Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: **drc@purdue.edu** or by phone: 765-494-1247.

Mental Health Statement:
- If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack: https://purdue.welltrack.com/ . Sign in and find information and tools at your fingertips, available to you at any time.

- If you need support and information about options and resources, please see the Office of the Dean of Students, http://www.purdue.edu/odos, for drop-in hours (M-F, 8 am- 5 pm).
- If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services: https://www.purdue.edu/caps/(CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

Violent Behavior Policy: Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity. See the University's website for additional information.

Emergencies: 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. You are expected to read your @purdue.edu email on a frequent basis. See the University's website for additional information.

Disclaimer
This syllabus is subject to change.