Proposed Graduate Certificate Program

Title of Certificate
Community Engagement in Rivers and Watersheds

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Rationale for Certificate Program

This certificate program will provide training for STEM graduate students in community-engaged research and scholarship. Central to this program is the vision to transform graduate training from an 'outreach' oriented model to an 'engagement' oriented one, building on the extension model. In the outreach model, university researchers develop research programs based on what they believe the needs of the community should be and ultimately deliver results to the community through publications or Extension. By contrast, an engagement model begins with the recognition that communities face diverse and complex issues and that they may already possess a variety of assets to identify problems or implement solutions. When those assets are deployed in partnership with those of scientists, solutions and opportunities are co-produced. This certificate program uses the engagement model as a powerful driver of new approaches to scientific training, research, and problem-solving. Instead of training students solely in disciplinary or multidisciplinary research practices, students will develop the skills needed to translate their expertise to actual social-ecological problems. The engagement model embeds students in the multi-directional creation, transfer, and application of knowledge between communities, Tribes, the university, agencies, and policymakers. The engagement model is at the center of our certificate because it promotes transdisciplinarity, which is characterized by its (1) focus on socially relevant issues, (2) ability to transcend and integrate across disciplines, and (3) the co-creation of research with communities.

The Certificate builds on the foundation established by WSU's Rivers, Watersheds, and Communities Program (hereafter, RWC Program). The RWC Program is currently (2022-2026) funded via NSF's Research Traineeship (NRT) program and began training the first of four cohorts of graduate students in the Fall of 2022. The RWC Program aims to develop an

innovative and diverse STEM workforce to address challenges in rivers, watersheds, and communities as they relate to human and ecosystem health, with a focus on the Columbia River Basin. One of the key innovations of this program is how we train students to employ a community-engagement model to develop their scholarship, meaning that they learn how to enable shared leadership with communities in their research, to empower communities and develop sustainable solutions to environmental challenges. The RWC Program is an approach that prepares researchers for a wide variety of roles in problem-based research, and ensures students have the capacity to bridge disciplines and sectors and to solve the complex, multi-scale challenges that rivers and their communities face today and in the future. Students trained in this innovative way are essential for our sustainable future, as the Columbia River Basin (and other river basins around the world) is facing an invisible water quality crisis, negatively impacting human and ecosystem health. An interdisciplinary challenge such as this requires innovative scientists embedded in a variety of institutions within communities to solve problems and aid decision-making.

This proposed Certificate is intended to institutionalize the engagement model developed by the RWC Program at Washington State University, following the successful conclusion of the funding period. This certificate will train MS and PhD STEM students to do research to tackle the challenges outlined above hand-in-hand with the communities impacted. By valuing traditional and local knowledges as well as western science, students will learn how to find solutions to these pressing challenges *with* our communities.

This certificate is for MS and PhD students in the RWC related physical, biological, and social sciences, and engineering, across all schools and colleges that may find it valuable. The RWC program will train a total of 50 students over the length of the NSF funding period. Six out of seven students from the first cohort of the RWC Program ("trainees") are already pursuing the certificate, and we have received expressions of interest from additional current WSU graduate students over the last and current semester (i.e., students who are not trainees in the RWC Program). We anticipate the number of graduate students interested in the certificate will grow from the initial six to at least eight-to-ten more each year because of the broad faculty and student participation in the RWC Program already, expressed student interest via the growth of the RWC research group at WSU, and the global call for communities to unite in ensuring sustainable development goals are achieved.

In Washington and beyond, natural resource and health challenges continue to be challenges to social, economic, and environmental sustainable development, exacerbated by the context of climate change. The need for scientists who can understand the physical, biological, and social dimensions of the challenges that communities face and who can innovate solutions to such challenges in collaboration and in shared leadership with communities will only continue to grow. The RWC Program focuses on recruiting diverse students (with a focus on underrepresented minority groups) and works closely with WSU's Center for Native American Research and Collaboration (faculty from this Center are co-PIs on the RWC Program NSF NRT grant) and WSU's McNair Scholars program. Therefore, we also anticipate that this certificate program will continue to attract a diverse student cohort.

Student Learning Objectives

The Certificate will (1) effect a cultural and methodological shift in how research is taught and conducted by valuing transdisciplinary learning and the benefits of community-engaged research, and (2) transform WSU's STEM graduate training into a student-centered mentoring model, preparing students for a variety of careers within and outside of academia. This certificate will help students to develop a critical scientific understanding of social-ecological systems, a leadership practice, and the methodological understanding and practice of carrying out community-engaged scholarship in environmental management.

Students earning this certificate will be able to:
- Demonstrate conceptual understanding of social-ecological systems.
- Critically explore, evaluate, and practice community-engaged scholarship.
- Define and apply ethical, socially responsible practices in research and problem solving.
- Learn to embrace a diversity of perspectives across professions and cultures and understand how their work fits in the larger social, cultural, and policy context.
- Work on complex challenges involving socio-environmental systems in interdisciplinary teams.
- Integrate perspectives from other disciplines and non-academics to understand problems, co-create questions, and synthesize research results.
- Develop and carry out community-engaged research proposals (the certificate "capstone" project – see #4 under "Certificate Requirements").
- Attend seminars, interact with academic and non-academic professionals through the ISE course, their community-engaged research proposal, and/or via CEREO seminar series to network and help strengthen their research and career preparedness.
- Develop science communication skills.

Admission Requirements

Current WSU Master's and PhD students are eligible to pursue the Certificate during any phase of their training, as long as they will have sufficient time to meet all of the requirements. It is recommended that students complete the certificate requirements over a minimum of 2 years, to allow for time to develop the community-engagement experience proposal and develop equitable relationships with the community(ies) they will work with. A simple application form (https://nrt-rwc.wsu.edu/science-certificate-application-form/) serves to inform students about the Community-engaged Scholarship Workshop (where students will receive an overview of the certificate requirements and get connected with other involved students and faculty), will inform CEREO and other faculty instructors about expected attendance at the Workshop and participation in courses, and will be a way to understand who is completing the certificate to help develop a cohort of community-engaged scholars at WSU. The administrative committee of the Certificate will

review applications on a rolling basis and inform applicants about upcoming events, workshops, and other events, as needed.

Certificate Requirements

Students earn the Certificate via a combination of coursework and project-based work that includes an immersive, real-world project experience (in a guided, interdisciplinary, studio-course setting) and the development and execution of community-engaged scholarship (student-driven). The following four certificate requirements deliver these opportunities:

1. **CE 543 Advanced Topics in Environmental Engineering Practice (Pullman) & Biol 589 (Vancouver) - Topic: Community-engaged Scholarship (1 cr.)** - This rotating topics class for 1 credit course will provide students with an introduction to the Certificate and its requirements, a theoretical and methodological overview of community-engaged scholarship, and guidance to develop a community-engaged scholarship proposal. The course will offer a history of community-engaged scholarship and research, a review of best practices and current trends, and will introduce students to relevant literature and case studies. Students will develop the plan for their community-engagement scholarship experience proposal (see #4 below). This proposal will be reviewed by the course faculty and will need to be endorsed by the student's major professor and community partner(s) (via letters of support).

    Students will be introduced to Individual Development Plan (IDP) templates, to help them chart their learning throughout the certificate program (and throughout their graduate degree if desired) and facilitate student-centered mentoring practices with their university and community mentors. At the conclusion of this course, students and their major graduate advisors will be required to sign a participation agreement form that outlines the certificate requirements, student responsibilities, and student opportunities, which will also serve as a confirmation that pursuing this certificate is in the student's best interest and that the student is in good standing. Students who choose to pursue the certificate must notify their department's graduate committee, their major advisor, and any other advisors they wish to engage with for successful completion of the certificate requirements. *(first offered Fall 2023 by RWC, meeting 1x week) Note: this course must be taken before earning credits for #4 the Community-engaged Scholarship Experience.*

2. **ANTH 591: Special Topics in Anthropology (2 cr.) Topic: Native Science, Tribal Environmental Policy and Collaboration –** This course will introduce students to historical and contemporary Tribal environmental perspectives, issues, knowledge, practices, and values with an emphasis on water systems and ecosystem management. Tribal sovereignty, Treaty rights, and Tribal collaboration and consultation process will also be examined to help students navigate partnerships

with Tribal governments. Students will gain a firm understanding of Indigenous Ways of Knowing (IWOK) and how this influences modern Tribal ecosystem management.

3. **ENGR 530: Interdisciplinary Research and Design (3 cr.) -** This integrated solutions experience focuses on literature review, resource flows, research proposal, and multidisciplinary team development. Using teamwork and problem-solving skills from multiple RWC disciplines through guided participation, this course works towards solutions to real, client-generated projects delivered to clients in the form of high-level, professional reports and presentations. Student-generated solutions may integrate Traditional Ecological Knowledge. Clients may include Tribal entities. *(first offered Fall 2023; equivalent course numbers will be developed at participating campuses, as needed)*

4. **SOE 592 - Advanced Topics in Environmental and Natural Resource Sciences. - 3 cr. Topic: Community-engaged Scholarship Experience. Fall, Spring, or Summer**
Credits will be assigned to practicing community-engaged scholarship and research through a student-developed project, such as:
   - Co-production of research to inform design, management, or policy
   - Citizen science research project
   - Work with members of a community or governmental organization, such as the EPA Restoration Working Group in the Columbia River Basin, to solve a pressing challenge
   - Co-produce outreach and training workshops for a community
   - Internships or research-related experiences with federal, state, tribal, or local agencies on research projects related to natural resources or environmental health research initiatives

   Students will be awarded credit for the Community-engaged Scholarship Experience upon meeting the following criteria: (1) certification that 120 hours have been devoted to the project, (2) a creative, sharable summary of the project that articulates at minimum the project, methodology, outcomes, and lessons learned (e.g., a StoryMap, short video), (3) a satisfactory evaluation of the student work and partnership by community partners, and (4) a short presentation at the annual RWC Program Symposium or at a CEREO seminar.

WSU's and the RWC Program's networks of colleagues and partner institutions throughout the state and beyond will help to ensure students have connections in their area of interest in which to develop community-engaged scholarship.

Other requirements:
   - Students must earn a minimum of a B grade in all four of the required credited courses / studies (listed above, #1-4) to earn the Certificate.
   - Certificate students will be expected to take advantage of relevant seminars across campus and interactions with seminar speakers to assist in building personal networks. Students will also be encouraged to attend and present

information at brown-bag discussions and/or symposia relevant to community-engaged scholarship across WSU.

Participating Faculty and Resources

Faculty and students from the following colleges, schools, and centers have participated in the RWC Program to date, and we anticipate their continued participation in the Certificate: School of the Environment, School of Biological Sciences, Civil and Environmental Engineering, Sociology, Anthropology, College of Communication, and the WSU's Native American Program's Center for Research and Collaboration. We would look forward to welcoming students from other STEM graduate programs that align with the certificate's goals, as interest arises.
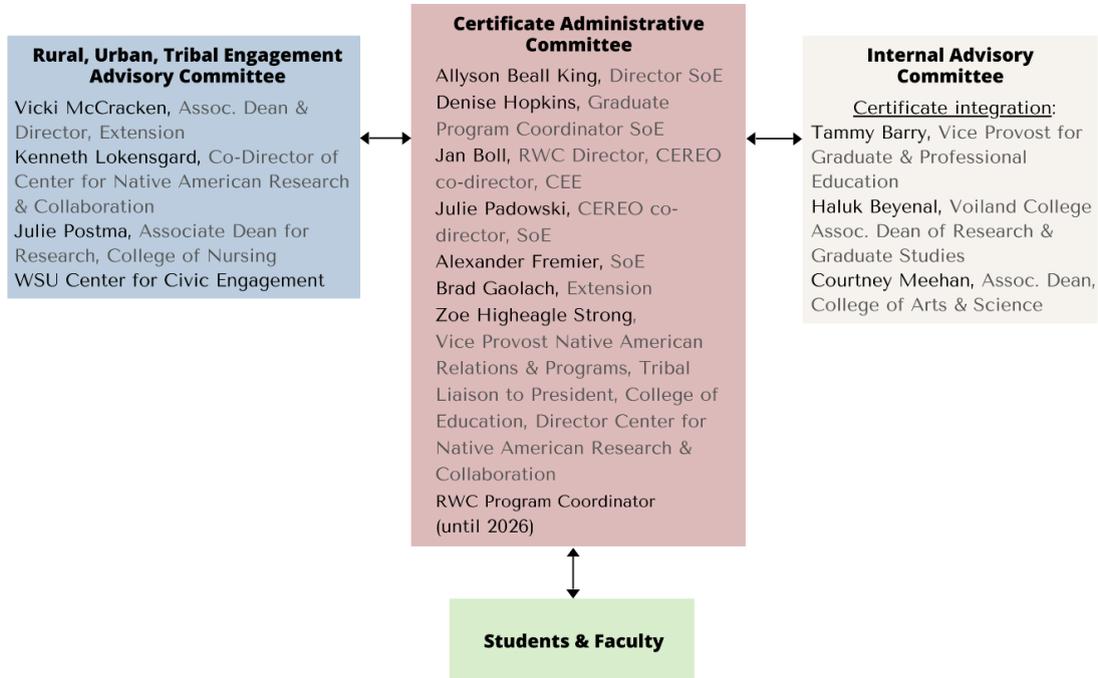
Administration and Oversight

The School of the Environment (SOE) will sponsor the Certificate and serve as the academic lead. The SOE will be assisted by a certificate administrative committee of five faculty members representing CAHNRS, CAS, and VCEA as well as Native American Programs and Tribal Relations. The current administrative committee is listed at the top of the proposal. Membership will be reviewed annually and amended as necessary. The committee will meet at a minimum once per semester. For the purposes of catalog and curriculum management, SOE will remain the primary point of contact and originate and process course and curriculum changes to the certificate. The RWC Program, under the Center for Environmental Research, Education, and Outreach (CEREO), will provide administrative support through the end of the NSF NRT grant period, 2026. The current organizational support structure (Fig. 1) currently provides oversight, support, and evaluation mechanisms for the RWC Program and will continue to do so for the certificate program (the external evaluation and program coordinator roles will cease at the end of the grant period, in 2026).

Day-to-day operations of the certificate program will be performed by the certificate administrative committee, in coordination with the responsible administrative staff from the SOE. Members of this committee will (1) coordinate the certificate across campuses, (2) review applications, (3) run the Community-engaged Scholarship Workshop, (4) coordinate administrative tasks (e.g., answering student questions, updating the website), (5) liase with graduate coordinators in each unit represented by students to help with keeping track of completed courses, etc., (6) will ensure oversight of satisfactory student completion of the Community-engaged Scholarship Experience, and (7) review any proposed course and curricular changes.

CERTIFICATE ADMINISTRATIVE ORGANIZATION

Rural, Urban, Tribal Engagement Advisory Committee

Vicki McCracken, Assoc. Dean & Director, Extension
Kenneth Lokensgard, Co-Director of Center for Native American Research & Collaboration
Julie Postma, Associate Dean for Research, College of Nursing
WSU Center for Civic Engagement

Certificate Administrative Committee

Allyson Beall King, Director SoE
Denise Hopkins, Graduate Program Coordinator SoE
Jan Boll, RWC Director, CEREO co-director, CEE
Julie Padowski, CEREO co-director, SoE
Alexander Fremier, SoE
Brad Gaolach, Extension
Zoe Higheagle Strong, Vice Provost Native American Relations & Programs, Tribal Liaison to President, College of Education, Director Center for Native American Research & Collaboration
RWC Program Coordinator (until 2026)

Internal Advisory Committee

Certificate integration:
Tammy Barry, Vice Provost for Graduate & Professional Education
Haluk Beyenal, Voiland College Assoc. Dean of Research & Graduate Studies
Courtney Meehan, Assoc. Dean, College of Arts & Science

Students & Faculty

Advertisement

The Certificate will be advertised through the participating faculty and schools, through the RWC Program website, via the Graduate School and CEREO, and through programs to target underrepresented minority student groups such as WSU's Native American Program's Center for Research and Collaboration, WSU McNair Scholars, and WSU's RADS community.

Assessment

The Certificate will be assessed on an annual basis. The assessment plan for this program will be created and approved by the administrative committee, who will represent their respective units. Feedback will be sought from community partners who engage with students and via a survey to major advisors and other faculty mentors of participating students. Over the next three years, the RWC Program's external evaluator will assess the Certificate Program. Elements of this professional evaluation may be carried forward after the RWC NRT funding period.

WASHINGTON STATE UNIVERSITY

CE 543 Advanced Topics in Environmental Engineering Practice (1 cr.)
Community Engaged Scholarship **Fall 2023**
Co-listed Biol 589 (Vancouver students)

Meeting schedule: Mon 15:10 - 16:00

Building/Room: TBD

Instructor:

Dr. Jan Boll, Professor   Office Hours: By appointment.
Civil and Environmental Engineering
PACCAR ETB 360
Email: j.boll@wsu.edu

Course Timeline and Weekly Topics:

Week	Dates	Topic	Guest Speaker
Week 1	Aug 21	Introduction to Certificate, RWC & Living Atlas	Julie Padowski
Week 2	Aug 28	StoryMap basics & data sources for RWC	Julie Padowski
Week 3	Sept 4	Labor Day	
Week 4	Sept 11	Student individual mentoring plan introduction	Erica Crespi
Week 4	Sept 18	Community engagement scholarship and plan template	Ben Calabretta
Week 5	Sept 25	River water quality and Watershed processes	
Week 6	Oct 2	Governance & Communities; Columbia River Treaty	.
Week 7	Oct 9	Individual Development & Community Engagement plan	
Week 8	Oct 16	River water quality solutions	
Week 9	Oct 23	Working on Living Atlas	
Week 10	Oct 30	Community Engagement Plan What are broader impacts?	Michael Goldsby & Samantha Noll
Week 11	Nov 6	Update on Living Atlas activities	
Week 12	Nov 13	Sociology and Human Health	Justin Denney
Week 13	Nov 20	Fall Break	
Week 14	Nov 27	Final plans	
Week 15	Dec 4	Presentations	

Course Description: The course will: (1) familiarize RWC students with study regions and varied Rivers Watersheds Communities (RWC) issues and build a foundation for research and related careers; and (2) gain cultural knowledge from community stakeholders and tribal members on Traditional Ecological Knowledge, local concerns, and management strategies for dealing with cross-scale RCW issues.

Students should expect to spend a minimum of 3 hours per week for each online 1-credit course, engaged in the following types of activities: reading, listening to/viewing media, discussion, or conversation in the LMS or other academic technology, conducting research, completing assignments and reviewing instructor feedback, studying for and completing assessments, etc.

Student Learning Outcomes & Assessment:

At the end of this course, students should be able to:	Course topics/dates:	This outcome will be evaluated primarily by:
Understand the river water quality issues in the CRB	All topics covered in weeks 1 through 14	Class meetings, presentations, discussions, work assignments
Complete a StoryMap and community engagement plan on a theme related to the RWC	All topics on the Living Atlas covered in weeks 1 through 14	In-class and out of class assigned activities on the Living Atlas
To develop an individual student mentoring plan	Prepared throughout the semester ending with final version in Week 15	Final version in Week 15

Grading Policy:

Living Atlas 20%   Individual Mentoring Plan 10%
Paper or Project 10%   Community Engagement Plan 25%
Attendance and Participation 10%   Final StoryMap and Presentation 25%

Grades will be posted via Canvas. Class participation is expected during course discussions and special topic presentations, including project presentations.

Grade Scale: 93.00-100% A, 90.00-92.99% A-, 87.00-89.99% B+, 83.00-86.99% B, 80.00-82.99% B-, 77.00-79.99% C+, 73.00-76.99% C, 70.00-72.99% C-, 60.00-69.99%, D, < 59.99% F. Rounding will be performed to two digits.

University policy (Acad. Reg. #90) states that Incompletes may only be awarded if: "the student is unable to complete their work on time due to circumstances beyond their control".

Description of Required Assignments: Readings and out-of-class work will be assigned following class meetings, at least on a weekly frequency. Collaboration on assigned work is encouraged. -- Each student prepares an individual mentoring plan, a community engagement plan, and contributes to the Living Atlas. A class presentation on the StoryMap is required on either a student proposed a StoryMap topic or a community engagement proposal. The topic will be proposed in Week 8 of the course. A draft version of StoryMap or proposal is due in Week 9, and the presentation will occur in Week 15. -- Effort statement: On average, it is expected that students will be involved in the course two hours per every hour-meeting, outside of class.

Attendance Policy: Class attendance is expected, and the instructor needs to be informed of missed classes ahead of time. Missing more than three classes without valid reason will result in a failing grade. Valid reasons are considered absences due to participation in off-campus, university-sponsored activities such as field trips, musical performances, judging teams, intercollegiate athletic events, etc. based on an official Class Absence Request form from the faculty or staff member supervising the off-campus activity, and due to illness, personal crises, mandated court appearances, parental responsibilities, and the like, as long as such absences are not excessive. Accommodations for valid absences will be considered on a case-by-case basis.

Academic Integrity: All members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Students are responsible for understanding the full Academic Integrity Statement. Students who violate WSU's Academic Integrity Policy (identified in WAC 504-26-010(3) and -404) will fail the course, will not have the option to withdraw from the

course pending an appeal, and will be reported to the Center for Community Standards. If you have any questions about what is and is not allowed in this course, ask your course instructor.

Class recordings: We will use technology for virtual meetings and/or recordings in this course. Our use of such technology is governed by FERPA, WSU's Electronic Communication Policy (EP4: https://policies.wsu.edu/prf/index/manuals/executive-policy-manual-contents/ep4-electronic-communication-policy/), and WSU's Student Code of Conduct (https://communitystandards.wsu.edu/). A record of all meetings and recordings is kept and stored by WSU, in accordance with WSU's Executive Policies and FERPA. Your instructor will not share recordings of your class activities outside of course participants, which includes your fellow students, TAs, and/or other instructional partners engaged with this course. You may not share recordings with individuals outside of this course. Doing so may result in disciplinary action.

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist on your home campus: **Pullman or WSU Online**: 509-335-3417, http://accesscenter.wsu.edu, Access.Center@wsu.edu.

Safety and Emergency Notification: Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "Run, Hide, Fight" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). -- Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's Run, Hide, Fight video and visit the WSU safety portal.

Important Dates and Deadlines: Students are encouraged to refer to the academic calendar often to be aware of critical deadlines throughout the semester. The academic calendar can be found at http://registrar.wsu.edu/academic-calendar/.

Electronic communication: Washington State University policy mandates that all electronic communication regarding any aspect of the class be conducted using official WSU email accounts (*i.e.* @wsu.edu). Emails sent from personal email accounts will not receive a response and their content will not be accessed, *so do not use your personal email account for class!*

Accommodation for Religious Observances or Activities: Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of absence. Students who feel they have been treated

unfairly in terms of this accommodation may refer to Academic Regulation 104 – Academic Complaint Procedures.

Weather Policy: For severe weather alerts, see: http://alert.wsu.edu/ and https://oem.wsu.edu/emergency-procedures/severe-weather/. In the event of severe weather affecting university operations, guidance will be issued through the alert system.

Anthropology 591 Special Topics in Anthropology (2 Credits)

Topic: Native Science, Tribal Environmental Policy and Collaboration

Instructor: Landon Charlo M.S., Ph.D. Candidate
Office: French 21 A
Email: lcharlo@wsu.edu
Office hours: TBD
Class Time: TBD
Class Location: Cleveland Hall

DESCRIPTION AND GOALS OF COURSE:

This course is an introduction to Native Science, Traditional Ecological Knowledge (TEK), and Tribal Environmental policy and collaboration as they pertain to Indigenous peoples of the Pacific Northwest and graduate students in the Rivers, Watersheds, and Communities certificate program, and other environmental fields. In this course students will be introduced to Native Science, TEK and their convergent concepts and practices by Native Tribes of the Columbia River Watershed. Students will be asked to consider the relationship between Native Science, TEK, and Tribal values and how they are influencing current Tribal environmental policy and collaborations when managing water systems.

Ultimately, this course will provide the student with the background necessary for understanding contemporary Tribal water management systems and processes and protocols necessary for respectful and relevant collaborations between non-Tribal entities and Tribal governments. This course will additionally introduce students to topics of Tribal sovereignty, Tribal environmental sacredness, and Tribal consultation processes. The following table identifies specific learning goals ("LG"):

	At the end of this course, students should be able to:	This objective will be evaluated primarily by:	Assignments and Activities advancing students toward these learning goals:
LG1	Understand concepts of Native Science and TEK, and how the Indigenous Way of Knowing (IWOK) paradigm compares and contrasts to views and practices of modern Western science; with an emphasis on water systems and ecosystem management.	Classroom discussions; graded assignments; guest lectures	Readings, discussions (weeks 1-5); guest lectures (entire semester); responses to guest lectures

LG2	Understand Tribal value systems and how they influence Tribal environmental management processes and protocols. Understand Tribal sovereignty, Treatise, and processes and protocols for relationship building and consultation.	Classroom discussions; writing assignments; guest lecture; classroom presentations	Readings, discussions, (weeks 6-10); reflection and writing assignment
LG3	Identify current issues in Tribal water systems and ecosystem management. Design a management plan for a collaborative research project between student and Tribal government that bridges IWOK and Western science philosophies, values, and management practices.	Classroom discussions; individual meeting; management plan	Readings, discussions, and assignments (weeks 10-15); Management Plan Proposal

Requirements and Grading

This course (Native Science, Tribal Environmental Policy and Collaboration**)** is worth two credits. According to WSU guidelines, this means you should expect to devote approximately 90 hours of your semester to its completion. These hours include work both in and outside of class.

During the semester, you will complete **three primary assignments**: 1) two reaction papers (5 pages in length) from guest lectures (20 pts), 2) an oral presentation of Indigenous Ways of Knowing and how this influences modern environmental management; students will choose topics of interest from published Tribal management plans (10-15 minutes) (20 pts), and 3) your written management plan (10 pages) (30 pts).

Grade scale:

93.00-100% A, 90.00-92.99% A$^-$, 87.00-89.99% B$^+$, 83.00-86.99% B, 80.00-82.99% B$^-$, 77.00-79.99% C$^+$, 73.00-76.99% C, 70.00-72.99% C$^-$, 60.00-69.99%, D, < 59.99% F. Rounding will be performed to two digits.

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ENGR 530: Interdisciplinary Research and Design (3 cr.) - Syllabus

RIVERS, WATERSHEDs AND COMMUNITIES INTEGRATED SOLUTIONS EXPERIENCE

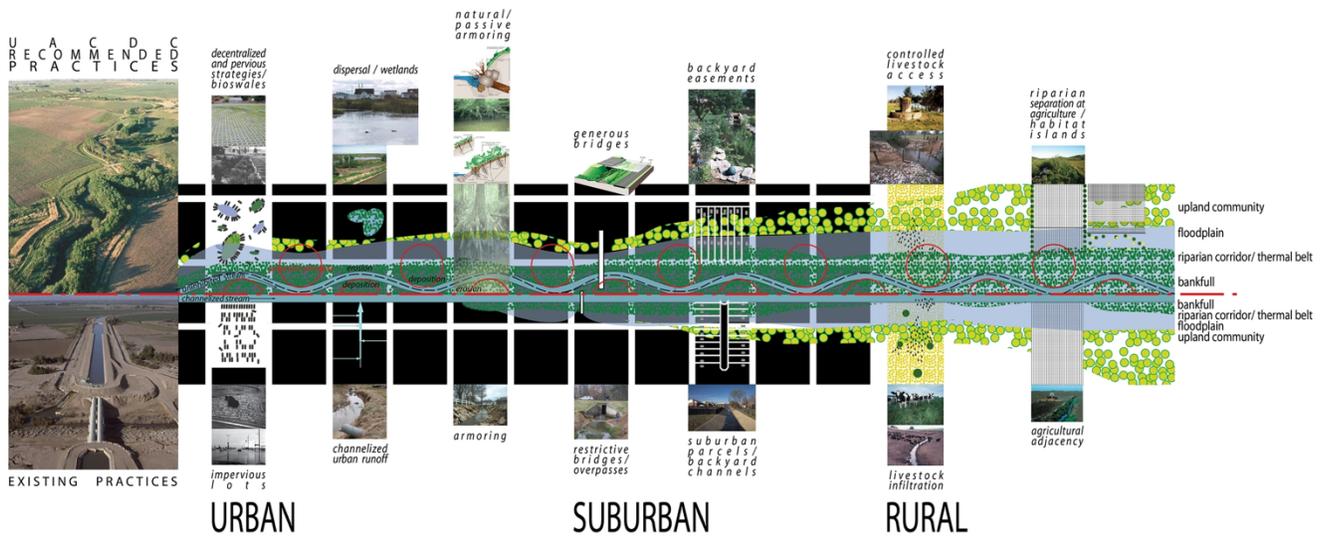Washington State University
Fall 2023 | T TH 11 - 1 PM

Image Credit: University of Arkansas Community Design Center
Watershed Urbanism proposes a "rewilding" of riparian corridors to restore lost ecological functioning while forming well-amenitized urban networks of linear parks, neighborhood open spaces, and pedestrian facilities.

INSTRUCTORS

Professor: Kate Kraszewska
Office Hours: Wed 11- 2pm
E-mail: k.kraszewska@wsu.edu
Office: PACCAR 452
Additional professors will join the course as guest lecturers and team-mentors

CLASS DETAILS

Class Website:	Canvas	
Credits:	3 credit hours	
Prerequisites:	graduate degree standing, instructor permission if course is not required for your major	
Lecture:	Tuesday (11-12 p.m)	Remote/Video Conference
Studio:	**Tuesday (12-1pm.) and** Thursday (11-1 p.m)	PACCAR 401 / Remote Access
Class Format:	Regular class periods used for lecture, small group discussion, student presentations, and team project work.	

INTRODUCTION

Focusing on the Columbia River Basin (CRB), this course teaches graduate students how to study challenges in rivers, watersheds, and communities as they relate to human and ecosystem health. Central to this course is the development of community engagement skills, which begins with the recognition that communities face diverse and complex issues and leverages local knowledge to identify key problems or implement equitable solutions. Working with a 'Client', students will engage directly with real world needs in a specific community in order to produce solutions and opportunities that can be directly utilized and applied.

This course will integrate topics from the natural sciences, engineering, social sciences, and traditional knowledge, in order to develop a transdisciplinary approach to community problem solving within river-watershed-community (RWC) systems that ultimately produces equitable solutions to pressing, societal problems experienced by diverse communities. Course activities are focused on two objectives: (1) embracing transdisciplinary learning (2) and the co-production of science through community engagement. Lecture and research themes address basic and applied questions related to water quality and landscape dynamics of river systems, to anthropogenic changes in the environment that affect ecosystem health, and to equitable mitigation of the cultural, economic, or health consequences experienced by communities.

COURSE OBJECTIVES

The goals for this class are to have every student exit with strong collaborative research, questioning, and analysis methods to utilize in their academic and professional work. The focus will be on developing the tools that lead to open-source design thinking processes, fostering innovation across multiple disciplines of research and practice.

At the completion of this course students should be able to:
- Explore integrated principles for design solutions at the watershed scale
- Examine design solutions that explore the intersection of land use, regional ecology, and global systems - Investigate global issues within a local context (glocalism)
- Provide instruction and a framework for developing design solutions that link global issues and site specific needs, programs, and/or challenges
- Recognize connections among the local and the global
- Describe how and why a discreet design intervention becomes significant across diverse temporal and spatial scales
- Develop design solutions that relate to and are informed by specific watershed processes and community interactions
- Design in harmony within contextual social realms and ecosystems
- Consider human behavior, diversity, and accessibility in design solutions
- Use systems thinking approaches to design
- Deliver persuasive and professional presentations of design strategies to stakeholders and design professionals/faculty
- Create professional quality presentations

TEXTS

None: Various readings will be provided throughout the semester.

COURSE ASSIGNMENTS

The assignments listed below, as well as the participation in the class will be the primary assessment for each student with following percentages.

Assignment 1:	Community Engagement/ Inventory	15%
Assignment 2:	Analysis/ Conceptual Design	15%
Assignment 3:	Design Proposal and Presentation	40%
	Participation	30%
TOTAL		**100 %**

Community Engagement/ Inventory (15% of Grade)

The Community engagement and inventory phase is a critical component of the project because it defines the activities and interventions needed for site design.   The purpose of the program phase is to further clarify the scope of work, on-site operations, facility needs, and cost estimates for a general site.   Literature review and resource flow analysis will be used to provide a framework to identify the programming for each site type. A resource flow analysis aims to quantify the flow of resources, measured in mass, within a defined geographical area or industry sector over a set period of time. A resource flow analysis can point to opportunities for understanding and managing materials consumption and minimization.

Analysis/ Conceptual Design (15% of Grade)

A proposal of a project innovation or analysis technique will be proposed in the second phase of the project. The proposal will focus on a specific component of the project to provide understanding that will improve the overall product. Proposals will be reviewed by faculty to assess the scope and potential impact on the project. Proposal's will be presented to ENGR 430 students.

Design Proposal and Presentation (40% of Grade)

Design development of a prototype or experimental design will commence upon approval of the proposal. Students will work to provide a working prototype or analysis technique ready for data collection and testing during the second half of the course. A final presentation of the prototype or analysis technique will be presented to the ENGR 430 students to further the analysis of the project.

Participation (30 % of Grade)

Due to the nature of the course, the coursework is highly group oriented. Each student will work with undergraduate students working on the same project and must provide direction and results accordingly. In light of this fact, each student will be graded upon their individual participation in the class. The professors as well as the group members will grade each of the students on their participation. This includes class attendance, participation in group discussions, and involvement in group projects.

SCHEDULE + WEEKLY FOCI *

*Subject to change

DATE (Tuesday Thursday)	DISCUSSION TOPIC	STUDIO PHASE	READINGS
Aug 22 - 24	Course Introduction		
Aug 29 - 31	Intro, Team Building	Project 1 - Inventory Engagement	Case Study Analysis: Conway Urban Watershed, Riparian Meadows, Mounds, and Rooms Urban Greenway for Warren, Arkansas, etc
Sep 5 - 7	Programming (Lecture, Concepts, Tutorials)		Reed, Chris. 2010. "The Agency of Ecology" and Ndubisi, Forster,eds. The Ecological Design And Planning Reader. Print.
Sep 12 - 14	Programming (Informal Crits)		
Sep 19 - 21	Programming (Redline Review)		Dramstad, Wenche - Landscape ecology principles in landscape architecture and land-use planning.
Sep 26 - 28	PRESENTATION: Inventory		
Oct 3 - 5	Proposal (Lecture, Concepts, Tutorials)	Project 2- Concept Proposal	Water Resources Planning and Management by R. Quentin Grafton , and Karen Hussey
Oct 10 - 12	Proposal (Informal Crits)		
Oct 17 - 19	Proposal (Redline Review)		
Oct 24 – 26	PRESENTATION: Concept Proposal		
Oct 31 -Nov 2	Design Development I (Lecture, Concepts)	Project 3 Final Design	Planting in a Post-Wild World: Rainer, Thomas, and Claudia West.
Nov 7 - 9	Design Development I(Informal Crits)		
Nov 14 - 16	Design Development I(Redline Review)		
Nov 21 – 23	FALL BREAK		
Nov 28 – 30	PRESENTATION: Design Development I	Project 3 Final Design	
Dec 5 - 7	Design Development II(Lecture, Concepts)		
Dec 12 - 14	Design Development II(Preparation)		
Dec 19 - 22	PRESENTATION: Design Development II		

GRADE ASSESSMENT

A grade	States analysis and design articulately, reflecting unquestioned competence and strong commitment to satisfying broad stakeholder needs and concerns. Produces innovative work products of exceptional quality and impressive value, justifying design continuation through a sustainable metric. Participates in and leads effective communication and team processes that engage clients, empower team members, efficiently and effectively achieve individual and collective goals, and produce quality work products and experiences. Displays competency in understanding, application, and extension of disciplinary knowledge. Sets challenging personal goals, self-assesses, and energetically learns and draws on diverse human, fiscal, and technology resources to grow personal productivity needed for the project.
B grade	States analysis and design understandably, reflecting credible ability and commitment to satisfying primary stakeholder needs and concerns. Produces work products of good quality and moderate value, supporting project continuation financially and functionally. Participates in reasoned communication and team processes that engage clients and team members, achieve individual and collective goals, and produce beneficial work products and experiences. Displays competency in understanding and application of disciplinary knowledge. Sets personal goals, occasionally self-assesses capabilities, and purposefully learns and draws on human, fiscal, or technology resources to support personal productivity in the project.
C grade	States analysis and design deliverables with mixed completeness and credibility, reflecting uncertain ability or commitment to address stakeholder needs and concerns. Produces work products of satisfactory quality and value, causing questions about financial or functional merits of project continuation. Participates in casual communication and team processes with clients and team members, achieving a reasonable subset of project goals, and producing mediocre work products and experiences. Displays competency in understanding of fundamental disciplinary concepts. Sets few if any personal goals, self-assesses only when prompted, and learns and uses new resources when pushed by others for the sake of the project.
D grade	Analysis and design deliverables are stated vaguely and with little credibility, reflecting poor ability or commitment to address stakeholder needs and concerns. Produces work products of poor quality and value, causing major concerns about financial or functional merits of project continuation. Participates very little in communication and team processes with clients and team members, achieving very few project goals, and producing poor work products and work experiences. Displays little competency in fundamental disciplinary concepts. Sets no personal goals, self-assesses only superficially when asked, and resists learning and use of new resources when asked by others for the sake of the project.
F grade	Analysis and design deliverables are not articulated understandably, reflecting no ability to address stakeholder needs and concerns. Produces very few work products and usually of poor quality and value, showing clearly that financial investment for project continuation is not merited. Fails to communicate and work with teammates and clients, not achieving major project goals, and producing very poor work products and work experiences. Displays little ability in fundamental disciplinary concepts. Sets no personal goals, does not self-assess even when asked, and resists learning and use of new resources when asked by others for the sake of the project.

GRADING SCALE

Grades will be awarded based on a percentage scale as shown below.

93 - 100%	A	77 - <80%	C+
90 - <93%	A-	73 - <77%	C
87 - <90%	B+	70 - <73%	C-
83 - <87%	B	60 - <70%	D
80 - <83%	B-	< 60%	F

LEARNING GOALS

This course integrates the University learning goals (http://ugr.wsu.edu/faculty/7goals.html) through an interdisciplinary, team based, research project experience. Through the learning outcomes listed below, Engr 470 especially addresses Critical and Creative Thinking (Learning Goal #1), Quantitative Reasoning (Learning Goal #2), Information Literacy (Learning Goal #4), Communication (Learning Goal #5), and Depth, Breadth, and Integration of Learning (Learning Goal #7).

Learning Goals Summary Table:

Learning Goals	At the end of this course, student should be able to:	Relevant Course Topics	This objective will be evaluated by:
Critical and Creative Thinking	Propose and design an experiment or analysis technique that will further enhance the sustainability of a given engineering process.	Proposal and design development	Faculty review of proposal and design development reports.
Quantitative Reasoning	Development of analysis techniques for sustainability metrics, including researching previous analysis techniques used.	Programming literature review and proposal	Faculty assessment of Programming and proposal documents
Scientific Literacy	Have a basic understanding of major scientific concepts and processes required in the engineering design process related to sustainability.	Programming literature review.	Faculty assessment of Programming and proposal documents
Information Literacy	Be able to access, learn, process, and demonstrate knowledge competence to advance a team-based design project.	Technical report writing,	Programming, Proposal, and Design development documents,

Communication	Communicate effectively in written and oral forms to teammates, clients, technical experts, and stakeholders.	Preparing written technical reports and oral presentations	Faculty and stakeholder assessment of all Written technical reports, Technical presentations
Depth, Breadth, and Integration of Learning	Demonstrate preparation for engineering practice through an integration of knowledge and skills acquired in earlier coursework and incorporate appropriate design standards and multiple realistic constraints.	Proposal and design development,	Faculty and stakeholder assessment of written documents and oral presentations

ACADEMIC INTEGRITY

- All members of the University community share responsibility for maintaining and promoting the principles of truth and academic honesty.
- The Office of Student Standards and Accountability has a policy defining academic dishonesty and the procedures to follow if dishonesty occurs. This information can be found at www.conduct.wsu.edu.
- Cheating or plagiarism in any form will not be tolerated. Cheating includes, but is not limited to, copying work or allowing your work to be copied. Plagiarism includes resubmitting previously graded homework from a previous semester, even if it was your own work.
- If academic dishonesty has occurred on any homework, test or other assignment:
    1. The student will be required to write a 2 page paper to discuss the incident.
    2. The incident will be reported to the Office of Student Standards and Accountability.
    3. The professor will deliver an appropriate reduction in grade or fail the student from the course.
- A second incident of cheating may result in dismissal from the university.

WSU EXPECTATIONS

The goal of Washington State University is to provide students with the knowledge, skill and wisdom they need to contribute to society. Our rules are formulated to guarantee each student's freedom to learn and to protect the fundamental rights of others. People must treat each other with dignity and respect in order for scholarship to thrive. Behaviors that are disruptive to teaching and learning and that create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will not be tolerated.

STUDENTS WITH DISABILITIES

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center. All accommodations MUST be approved through the Access Center (Washington Building Room 217). Please stop by or call 509-335-3417 to make an appointment with a disability specialist.

SOE 592 - Advanced Topics in Environmental and Natural Resource Sciences. - 3 cr.
Topic: Community-engaged Scholarship Experience. **Fall, Spring, or Summer**

Instructor(s): Julie Padowski

Meeting schedule: independent study, project-based

Course Description:
These credits are awarded for students' completion of a community-engaged scholarship or research project. Such scholarship and/or research is the culmination (capstone) of students' learning and participation in the Community Engagement in Science and Decision-Making Certificate. Although these credits are awarded during the semester that the project is completed, the community-engagement for the project may span multiple semesters. Students will begin planning for this project in their first semester in the Certificate program via the Community-engaged Scholarship (1 cr.) course (CE 543 [Pullman] & Biol 589 [Vancouver]). In that course students will be introduced to the theory and methodologies crucial for ethical, successful community-engaged scholarship and will be coached through developing a "Community-Engagement Plan" – a project proposal. This Community-Engagement Plan will continue to be developed and implemented during the duration of student's graduate degree. Carrying out this planned work and the resulting products will result in the earning of the 3 credits from this *Community-engaged Scholarship Experience* independent project course. This project may be a part of a student's thesis or dissertation, or may be a separate project-based effort. WSU's and the RWC Program's networks of colleagues and partner institutions throughout the state and beyond will help to ensure students have connections in their area of interest in which to develop community-engaged scholarship.

Community-engaged scholarship or a community-engaged research project can be one of the following:
- Co-production of research to inform design, management, or policy
- Citizen or community science research project
- Work with members of a community or governmental organization, such as the EPA Restoration Working Group in the Columbia River Basin, to solve a pressing challenge
- Co-produce outreach and training workshops for a community
- Internships or research-related experiences with federal, state, tribal, or local agencies on research projects related to natural resources or environmental health research initiatives

Course Requirements:
Students will be awarded credit for the Community-engaged Scholarship Experience upon meeting the following criteria:
(1) certification that 120 hours have been devoted to the project
(2) a creative, sharable summary of the project that articulates at minimum the project, methodology, outcomes, and lessons learned (e.g., a StoryMap, short video)
(3) a satisfactory evaluation of the student work and partnership by community partners (rubric to be provided)
(4) a short presentation at the annual RWC Program Symposium or at a CEREO seminar

Student Learning Outcomes & Assessment:

At the end of this course, students should be able to:	How this outcome is supported:	This outcome will be evaluated primarily by:
Articulate the principles, purpose, methodologies, and appropriate use of community-engaged scholarship	Via training in the Community-Engaged Scholarship course and continued guidance from mentors	Satisfactory presentation of final project
Develop a plan for community-engaged research or scholarship using appropriate methodologies (Community-Engagement Plan)	Via training in the Community-Engaged Scholarship course and continued guidance from mentors	Submission and execution of Community-Engagement Plan
Undertake community-engaged research or scholarship	The development, refinement, and carrying out of the Community-Engagement Plan for research/scholarship	Successful completion of a community-engaged project or experience (as evaluated by community members [rubric] and WSU faculty/staff [via project summary and presentation])
Practice ethical, responsible, and reciprocal engagement with communities (i.e., those outside of the university setting)	Via guidance from Community-Engagement Plans	Satisfactory evaluations by community partners

Grading Policy:
Final Community-Engagement Plan 20%
Sufficient project hours completed 20%
Creative, shareable project summary 20%
Satisfactory evaluations by community partners 20%
Public presentation of work 20%

Grade scale: 93.00-100% A, 90.00-92.99% A-, 87.00-89.99% B+, 83.00-86.99% B, 80.00-82.99% B-, 77.00-79.99% C+, 73.00-76.99% C, 70.00-72.99% C-, 60.00-69.99%, D, < 59.99% F. Rounding will be performed to two digits.

University policy (Acad. Reg. #90) states that Incompletes may only be awarded if: "the student is unable to complete their work on time due to circumstances beyond their control".

University policies

Academic Integrity: All members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Students are responsible for understanding the full Academic Integrity Statement. Students who violate WSU's Academic Integrity Policy (identified in WAC 504-26-010(3) and -404) will fail the course, will not have the option to withdraw from the course pending an appeal, and will be reported to the Center for Community Standards. If you have any questions about what is and is not allowed in this course, ask your course instructor.

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Important Dates and Deadlines: Students are encouraged to refer to the academic calendar often to be aware of critical deadlines throughout the semester. The academic calendar can be found at http://registrar.wsu.edu/academic-calendar/.

Electronic communication: Washington State University policy mandates that all electronic communication regarding any aspect of the class be conducted using official WSU email accounts (*i.e.* @wsu.edu). Emails sent from personal email accounts will not receive a response and their content will not be accessed, *so do not use your personal email account for class!*

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March 2, 2023

To Whom It May Concern:

The College of Arts and Sciences (CAS), College of Agricultural, Human, and Natural Resource Sciences (CAHNRS), and the Voiland College of Engineering and Architecture (VCEA) strongly support this proposal for the *Community Engagement in Rivers and Watersheds* graduate certificate. This proposed certificate will be administered through the School of the Environment (SOE) and will institutionalize the graduate training originally developed via Washington State University's (WSU) successful NSF Research Traineeship grant, the Rivers, Watersheds, and Communities (RWC) Program.

The Certificate builds on the innovative approach to graduate training that was developed as a part of the RWC Program – community-engaged scholarship. WSU graduate students will learn how to co-create research with their communities, allowing for the development of new knowledge and sustainable solutions to our most pressing social-ecological challenges. This certificate also allows students to build their leadership skills and work across disciplines, together preparing them with in-demand skills for a wide variety of STEM careers. The Certificate has great potential to enhance the opportunities available to graduate students and to shift graduate training from an outreach model to an engagement model.

We also support the shared administration through SOE and the certificate administrative committee with representation of CAS, CAHNRS, and VCEA. The proposed faculty administrative structure will ensure that each college has input into the trajectory of the certificate trainings. Community-engaged research and scholarship is vital for solving our communities' wicked challenges, and we support mechanisms to develop this practice across our Colleges and the WSU System.

Sincerely,

Todd Butler, Dean
College of Arts and Sciences

Wendy Powers, Dean
College of Agricultural, Human, and Natural Resource Sciences

Mary Rezac, Dean
Voiland College of Engineering and Architecture