

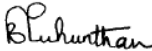
PROPOSAL TO OFFER A NEW DEGREE PROGRAM OR EXTEND AN EXISTING DEGREE TO GLOBAL CAMPUS

Degree Title:	Master of Engineering in Civil Engineering
Academic Program:	Civil and Environmental Engineering
Academic Plan:	
Number of Credits:	30 Credit Hours
Department(s) or Program(s):	Civil and Environmental Engineering (CEE)
College(s):	Voiland College of Engineering and Architecture
Campus(es):	Pullman and Global
Method of Instructional Delivery:	Online via Global Campus

Contact Name:	Dr. Haifang Wen	Email Address:	Haifang_wen@wsu.edu
Contact Phone:	509-335-4602	*Proposed start date:	Fall 2021

***Proposed Start Date:** Approval must be received from the Northwest Commission on Colleges and Universities before the program may be advertised or recruited for. Financial aid may not be available until the program has been approved by the Department of Education subsequent to NWCCU approval.

SIGNATURES: The names typed below certify that the relevant academic and campus officials have reviewed and approved this proposal:

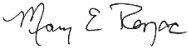
Chair Signature:		Date:	Nov 12, 2020
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Everett Chancellor:		Date:	
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Spokane Chancellor		Date:	
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Tri-Cities VCAA		Date:	
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Vancouver VCAA		Date:	
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Dean Signature:		Date:	Nov 17, 2020
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VP Global Campus:		Date:	
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Provost Office:		Date:	
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Comments:	
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For Registrar's Office Use Only:					
Current CIP Code:		New CIP Code:		Date:	

Send completed form in Word format to: provost.deg.changes@wsu.edu

This template asks you to answer the array of questions about your proposed program that are important to your department, your college, the Faculty Senate, the State of Washington, accreditors and other external stakeholders.

By placing all proposals in a similar format, this template provides a common standard for comparison, ensuring that all potential programs can be evaluated in an equitable fashion. It can be used to determine whether or not a program is feasible within the university's academic and financial situation, and if it will have the resources to further the University's objective of providing high quality education and scholarship.

This template is also a framework to think about the viability of your ideas. It can thus be a tool for strengthening both your proposal and the resulting program itself, since a program that is starved for either students or resources from its inception is not likely to become a high quality program.

Here are some of the things to consider as you complete the template:

What are the aspirations for the reputation of this program – local, regional, national? What will it take to make that a reality?

Who are you trying to attract with this new program? Will it bring new students to the university, better meet the needs of current students in the department, or draw students away from other departments?

How strong is the demand for education of this kind, and in what specific careers will someone who receives such an education find meaningful employment?

How many students do you need to attract to break even, and can both the market and WSU's capacity support this number?

Providing good answers to hard questions maximizes the likelihood that a new program will not just win acceptance by the Faculty Senate and administration, but will ultimately be successful in attracting students and placing graduates. The analyses in the Demand, Financial and Library workbooks will assist you in creating a persuasive proposal. The findings in each area, and their basis or justification, should be summarized in the proposal itself.

Proposal

Mission and Core Themes (Strategic Goals):

Provide a clear statement of the nature and purposes of the new degree in the context of WSU's mission and core themes (strategic plan).

Through extending the existing Master of Science in Civil Engineering by adding the Master of Engineering in Civil Engineering, we leverage the world class faculty and courses that WSU provides to offer another option of a professionally focused non-thesis course-only Master of Engineering with a focus on Civil Engineering.

Our programs provide a solid foundation in the fundamentals of engineering and science combined with technical expertise in specialized areas of the field.

The faculty members in the CEE program are leading experts in their respective disciplines. Our faculty members lead academic instruction and research activities in infrastructure, geotechnical and transportation, and environment.

By offering the proposed degrees online, WSU creates access to high-quality degrees in a high-demand discipline to those who may not be able to avail themselves of the physical campus degree. The Global Campus degree serves rural students, working professionals, and those who are place-bound for diverse reasons.

Educational Offerings:

Describe the degree program, including the total number of credits required. Provide the four-year degree plan (undergraduate) or appropriate plan of study (graduate and professional).

Please note that all courses for the degree must be approved before the degree will be reviewed by the Catalog Subcommittee.

The online program will allow place-bound students the same opportunity to earn a Master's degree as students who are not place-bound. In addition, the program gives access to students who prefer the convenience of the Global Campus without having to relocate to Pullman or Tri Cities to complete this degree program. As a professional master's degree program the degree is designed to meet the needs of aspiring and working professionals and adult learners. It will also provide opportunities for working professionals to refresh and update their skills and for those seeking to change careers. It offers all the opportunity to raise their credentials to WSU standards.

Additionally, the department intends to create relevant and desirable certificate programs that will appeal to those who desire upgraded credentials but are not interested in a full degree program.

See Exhibit A for degree plan

See Exhibit B for new course development and delivery schedule. |

Provide descriptive information regarding (the) method(s) of instructional delivery (percent face-to-face, hybrid, distance, and/or competency-based).
This degree will be delivered online, asynchronously via the Global Campus LMS infrastructure.
Students will access all courses via online delivery
Students will have the opportunity to engage in hands-on experiences in their own communities at the direction of their instructors in key courses to gain relevant experience and complete the requirements of the professional degree.

Assessment of Student Learning and Student Achievement

*** For graduate programs, please contact the Graduate School before completing this section.**

Please provide a list and description of expected student learning outcomes.
<ul style="list-style-type: none"> • Demonstrate the knowledge and skills that are necessary to achieve success as a practicing engineer. <ul style="list-style-type: none"> ○ A thorough foundation and advanced knowledge in fields of civil or environmental engineering. ○ The ability to apply their knowledge to solve novel and emerging problems in civil or environmental engineering. ○ The ability to present their knowledge through publications and oral presentations. ○ Employment in industry, consulting firms, or government agency. ○ Leadership in professional practice and service. • Engage in activities of life-long learning. <ul style="list-style-type: none"> ○ Engagement in continuing education and professional development. ○ Participation in professional organizations. ○ Obtained advance degree.

For undergraduate programs, provide the department’s plan for assessing student learning outcomes. Describe briefly how information on student learning will be collected and incorporated into existing processes for evaluating student learning in the department. Please attach the plan and a curriculum matrix.
N/A

Please indicate as appropriate:

- Assessment of this program will be incorporated into the existing assessment plan for Master of Science in Civil and Environmental Engineering. Please attach a copy of the existing plan. See Exhibit E
- A draft assessment plan is attached.
- A curriculum matrix is attached.

Planning:

Describe plans and include descriptions which provide evidence of:

1. The need for the change

The U.S. has approximately 1.6 million engineering jobs that pay \$42 per hour in median wages. Civil engineers account for the most jobs of any engineering field (274,000 in 2014), followed closely by mechanical engineers (264,000) and industrial engineers (229,000). Those three engineering jobs, plus electrical engineers and electronics engineers, make up two-thirds of the American engineering workforce. (Source: <http://www.forbes.com/sites/ems/2014/09/12/the-most-in-demand-and-oldestengineering-jobs/>)

The Bureau of Labor Statistics projects 19.7 percent employment growth for civil engineers between 2012 and 2022. During that period, about 53,700 jobs will open up. (Source: <http://money.usnews.com/careers/best-jobs/civil-engineer>)

Additionally:

1. Opportunity exists to enter the market for online master's programs in civil engineering.
2. The Bureau of Labor Statistics' employment projections for 2012-2022 show significant growth in job opportunities for civil engineers nationwide.
3. Enrollment in online master's-level civil engineering programs is on the rise.
4. Partnerships with area employers can provide a steady stream of students to online programs.
5. Many online civil engineering master's programs have a specific concentration within the field of civil engineering.
6. Institutions invest little in online civil engineering program marketing.

Source: EAB 2015 Report on Market Demand for Civil Engineering Master's Degree online.

By offering the proposed degree fully online, WSU is working toward state goals in economic and workforce development, "implementing innovations and new delivery designs to reengage adults", providing career connected learning, and "creating affordable, high-quality pathways that provide multiple routes to completion of certificates and degrees".

2. The student population to be served

Provide realistic justification for the projected FTE.

How can transfer students articulate smoothly into the program and complete it with approximately the same number of total credits as students who enter WSU as freshmen?

Please describe specific efforts planned to recruit and retain students who are persons of color, disabled, or whose gender is underrepresented in this discipline.

The Global Campus primarily serves working adults seeking additional skills and educational attainment. The Global Campus employs numerous recruiters and marketing professionals who seek appropriate students for all of our degree programs, though the college and department will be primarily responsible for marketing and recruiting directly related to this specific degree program.

Projecting online graduate enrollments in any major is difficult and an inexact science. However, based on the demand in the workforce, conferrals at competitive programs and WSU, and the performance of other recently-launched online master's programs at WSU, we anticipate the enrollment to reach approximately 40-45 in year 5.

Currently the Civil and Environmental Engineering department has recruited and retained diverse graduate students. We will continue to reach out to the minority groups, especially in Tri-Cities area and also through alumni, professional association and social media, etc. |

3. Procedures used in arriving at the decision to change (e.g., consultation with advisory boards, input from industry or employers, commissioned studies, faculty task force, etc.).

The director of program and partner development at the Global Campus has commissioned market research reports over the past several years which have indicated the market need for online master's degrees in civil engineering. In addition to these compelling reports, the department will take advantage of the current mechanism in place for existing MS degree to manage the online program. This mechanism gets inputs from our constituents, including the advisory board, alumni, Federal, State, and Local government, professional societies and their local chapters, industry, etc. A special task committee has been in place for two years which makes decisions related to the online program. Current faculty are fully engaged in the development of the online degree and online courses.

4. Organizational arrangements required within the institution to accommodate the change.

CEE plans to leverage existing faculty and teaching resources, including the Tri-Cities campus, for the online Master of Engineering degree to minimize extra costs, if any. In addition, the current marketing and recruiting efforts will be expanded to the online degree, including, but not limited to:

- **Alumni**
- Advisory board
- **Governments** (state, local)
- National lab
- **Consulting firms**
- Construction companies
- ASCE
- International students

5. Lay out a three-year timetable for implementation, including hiring plans, partnership contracts if needed, facilities modification, recruiting, and other elements of implementation. Provide dates for each step.

2020-2021	Course development (see course development schedule, Exhibit B) Begin offering the online major in Fall 2021 Marketing/recruitment
2021-2022	Hire clinical faculty as demand for courses exceeds the teaching load of current temporary and full-time faculty. Continue marketing/recruitment Course update according to schedule
2022-2023	Monitor enrollment in individual courses; revise frequency of offerings as indicated Begin assessment Continue marketing Course update according to schedule

Budget:

Attach the Financial Worksheet with five-year FTE, revenue and expenditure projections. Fully account for costs such as staff support, training, library, facilities and so on.

Please describe the funding picture narratively, including funding sources, department, college and/or campus commitments, investments already made, one-time costs, facilities costs (labs, classrooms, offices, telecom etc.) and library costs.

The department is not planning to hire any new faculty to support the online degree. Instead, the courses will be taught by existing faculty in concert with their on-campus courses.

Additionally, the department is proposing \$950 per credit to be in line with current online degree trends (see demand analysis). This additional tuition revenue will incentivize the department and college and support the growth of the program through marketing and corporate relation activities and continuous program improvement.

Please see Exhibits C and D for the budget model detail.

Student Services:

Describe the capacity of student support services to accommodate the change at this location. Include a description of admissions, financial aid, advising, library, tutoring and other services specific to this request.

The Global Campus provides comprehensive student services, often in collaboration and cooperation with the centralized units, to ensure student success. Included are dedicated recruiters, transfer credit evaluation, career counseling, financial aid, e-tutoring, student involvement, and tech support for online students. The Global Campus is also skilled in working with students to match their goals with the programs and services offered by WSU.

Additionally, WSU Global Campus personnel are the experts on adult and contemporary distance learners, and provide specialized services to meet the needs of these unique students.

WSU Global Campus creates opportunities for meaningful student engagement through unique student involvement activities offered virtually and face-to-face. The Global Campus provides a robust infrastructure of support programs to assist students enrolled at any degree level, and VCEA and CEE provide extensive advising to the students.

Describe the implications of the change for services to the rest of the student body.

Adding online courses and creating access to a new degree program adds opportunity and options for student success and flexibility that accommodates students' needs. Current students should not be negatively affected by the delivery of this new degree program and modality. Additionally, students and faculty from other WSU campuses will be able to participate in the courses (teaching and learning) when appropriate.

Physical Facilities and Equipment:

Outline the provision/s made for physical facilities and equipment at the proposed location that will support the program and its projected growth. Include videoconferencing and other technologies that support course delivery as well as classrooms, labs, and office space.

None. All online courses are fully supported by AOI and the Global Campus through the Learning Management System

Library and Information Resources:

Using the Library Analysis form, describe the availability and adequacy of library and information resources for this degree, degree level, and location. Note plans to address gaps.

Statement of Library Support

I am writing to state that the existing collections and services of the WSU Libraries can fully support the proposed extension of the Master of Civil Engineering to the WSU Global Campus. As the extension offers WSU Global students access to courses that already exist and are supported by the libraries, the impact of the on WSU Libraries' collections, services and personnel should be minimal.

Supporting the expansion of the Civil Engineering MS to the Global Campus is strongly in line with the WSU Libraries' mission and values (<http://libraries.wsu.edu/about/mission>), collection development policies, and information literacy teaching initiatives.

Looking toward the future, acquiring certain kinds of content in online formats, such as electronic standards and eBooks, is generally more expensive than purchasing resources for physical library collections. These kinds of resources are becoming more expected and desired by students on the physical WSU campuses as well as by Global Campus students. In the case of a WSU Global Civil Engineering MS program, the WSU Libraries can currently effectively support the proposed courses and research. However, moving forward online materials and subscriptions will increasingly become an issue for online programs needing access to electronic materials. For example, access to engineering standards electronically are usually unavailable due to vendor licensing and library budget constraints.

Outside of the continued need of support for electronic materials and subscriptions, WSU Libraries does have access to American Society of Civil Engineers Library, Web of Science, and ASTM Compass that all support this program. The current library journal and database subscriptions that support civil engineering students on the Pullman campus will support civil engineering students on the Global Campus. Additionally, all online library resources used by civil engineering students are already available to students on all WSU campuses, including the Global Campus. Owen Science and Engineering Library located in Pullman also has staff and librarians able to support this online program through information literacy instruction and resources to access to materials.

The Libraries have a well-established service in place for mailing print books and physical media items to WSU Global students who need them (for more information, see the Library Services for WSU Global Campus website, here: <http://libguides.libraries.wsu.edu/global>). While offering the Civil Engineering MS through the WSU Global Campus may involve some increased demand for these services, the increase would be minor and should not result in any negative impact on existing personnel and services.

Chelsea Leachman

Chelsea Leachman
Science & Engineering Librarian
Owen Library 115
Washington State University, Pullman
509.335.8527
chelsea.leachman@wsu.edu

Faculty:

List the educational and professional qualifications of the faculty relative to their individual teaching assignments.

List the anticipated sources or plans to secure qualified faculty and staff.

Existing faculty will develop and teach the online courses. All faculty teaching online are held to the same qualifications as faculty on the physical campuses. Deans and Directors are directly responsible for the hiring of all teaching faculty and ensure credentials are appropriate for the program, and will hire faculty using normal hiring processes. |

Impact on Other Locations/Programs:

Briefly describe any impacts on other WSU programs and locations, and how you came to these conclusions (who was consulted?). If there are potential adverse impacts, describe how these will be addressed. Consider such things as: reallocation of faculty time, reallocation of AMS courses, impact of blended courses, internal competition, “cannibalization” of other programs, curricular effects for other degrees, effects on recruitment markets for other campuses. Indicate how such problems will be addressed for each campus or department affected.

|We anticipate very few impacts on other WSU programs or locations.

The department of Civil and Environmental Engineering has faculty and a major in Pullman and Tri Cities. Because the primary market for the online major is place-bound students, and because of the policy which prohibits non-Global Campus students from enrolling in Global Campus courses in Fall and Spring semesters, the online program is unlikely to attract large numbers of physical campus-based students during the academic year. We have found that during the summer, students are increasingly taking courses online rather than face-to-face. This trend has had impacts on summer enrollments. Both campuses recognize that the addition of the online degree increases the need for us to coordinate offerings across the Pullman, Tri Cities, and Global campuses, and we are putting in place procedures for doing so in a systematic way. We anticipate that the addition of the online degree will allow us to use our resources more efficiently in order to serve students on all campuses, and instruction may originate from any campus which houses CEE faculty.|

Sustainability

What are the plans for continuing the program past 5 years if the goals for enrollment are not met, or other circumstances prevent the execution of the plan described here?

All new online degree programs will be evaluated continuously for enrollment and financial metrics. Under-performing degrees will be sunset once the college, department, and Global Campus have explored all reasonable efforts to increase enrollments and revenue through marketing, partnerships, and innovation. However, prior to sunseting (phasing out a degree for non-enrollment performance) a degree, the need for the courses that are provided online will also be analyzed to ensure little to no impact on other departments and programs that rely on those courses.

Any sunsetted degree will include an appropriate teach-out plan and students will be supported to graduation.

External Reviews

If this program is new to the Washington State University system, please provide the names and addresses of 2-3 external experts from similar institutions who could be contacted to provide reviews of this program.

Name	Contact Information (email, phone, address)

Attachments:

- Financial Worksheet
- Four-Year Degree Plan (undergraduate); curriculum overview (graduate and professional)
- Curriculum Map (undergraduate)
- Assessment Plan
- Letters of financial commitment
- Contracts or MOUs if applicable

Send in Word format to: provost.deg.changes@wsu.edu

EXHIBIT A

The Master of Engineering is offered by the Department of Civil and Environmental Engineering. A total of 30 semester credits are required based on course-work only. Up to 6 credits can be taken from the online Engineering Technology and Management or other online programs at Washington State University. The other 24 credits can be taken from the Department of Civil and Environmental Engineering in general or with emphasis in a specific area:

ENVIRONMENTAL ENGINEERING

Required Courses for the Air Group:

- CE 502 – Applied Meteorology
- CE 503 – Air Quality Management
- CE 515 – Environmental Measurements

Required Courses for the Water Group:

- CE 541 – Physicochemical Water and Wastewater Treatment
- CE 542 – Biochemical Wastewater Treatment
- CE 518 – Hazardous Waste Engineering
- OR
- CE 583 – Aquatic Chemistry

GEOTECHNICAL AND TRANSPORTATION ENGINEERING

Geotechnical Engineering Core courses:

- CE 510 – Advanced Geomaterial Characterization
- CE 527 – Engineering Properties of Soils
- CE 525 – Soil and Site Improvement

Transportation Engineering Core Courses

- CE 508 – Concrete Durability
- CE 567 – Properties of Highway Pavement Materials
- CE 572 – Advanced Pavement Design

HYDRAULICS AND WATER RESOURCES

Students may choose from a variety of graduate and selected undergraduate courses offered in the Hydraulics and Water Resources Program. In addition, courses may be selected from a number of related courses in other programs in the Department of Civil and Environmental Engineering, as well as in other departments of the University. Possible plans of study focused on a variety of topics are:

- Environmental Fluid Mechanics
- Aquatic Restoration
- Hydrodynamics and Sediment Transport
- Water Resources Management
- Advanced Hydrology

Coursework for a degree specializing in hydraulics and water resources should include the following core course:

- CE 560 – Advanced Hydrology

STRUCTURAL ENGINEERING, MATERIALS, AND SUSTAINABILITY

Suggested Core Courses:

- CE 514 – Advanced Mechanics of Materials
- CE 512 – Dynamics of Structures and/or CE 538 – Earthquake Engineering
- CE 430 – Analysis of Indeterminate Structures and/or CE 532 – Finite Elements

Common Electives:

- CE 534 – Prestressed Concrete and Reinforced Masonry Design
- CE 533 – Advanced Reinforced Concrete Design
- CE 539 – Advanced Design of Timber Structures
- CE 530 – Advanced Design of Steel Structures
- CE 535 – Advanced Finite Elements
- CE 505 – Decision-Making for Sustainable and Resilient Civil Infrastructure

EXHIBIT B

Course Development Plan

Course #	Course Title	Desired Development Term	Desired Delivery Term	Course Developer (faculty or Grad student)	Course Instructor
CE 567	Properties of Highway Pavement Materials	Summer 21	Fall 2021	H. Wen	H. Wen
CE514	Advanced Mechanics of Materials	Fall 2020	Fall 2021	P. Qiao	P. Qiao
CE531 (online only)	Advanced Steel Design	Summer 2021	Fall 2021	A. Phillips	A. Phillips
CE534 (online only)	Prestressed Concrete and Bridge Design	Summer 2020	Fall 2021	Christopher Motter	Christopher Motter
CE 564	Numerical Methods	Fall 2020	Spring 2021	N. Engdahl	N. Engdahl
CE 509	Numerical Modeling of Geomaterials	Fall 2020	Fall 2021	B. Muhunthan	B. Muhunthan
CE 512	Structural Dynamics	Fall 2020	Fall 2021	J. D. Dolan	J.D. Dolan

EXHIBIT C
Budget Detail (Proposed with Differential Tuition)

Breakdown of Tuition	Total 100%					
Return to Central Admin	20%					
Return to VCEA	80%	VCEA	7% out of 80% (or 9.6% of return to VCEA)			
		CEE	73%	CEE	Number of credit hours	See (3) for model
				Other programs or campuses	Number of credit hours	

Finance model example based on 10 students to complete a degree:

1	Number of students in class	10
2	Number of credits hours required to graduate for each student	30
3	Total credit hours for 10 students (10 students x 30 credit hours)	300
4	Tuition rate per credit hour	\$950
5	Tuition fees collected based 10 students	\$285,000
6	Return to Central Admin (20%)	\$57,000
8	Return to VCEA (80%)	\$228,000
9	Return to CEE (73% of 80%)	\$208,050

Finance model example based on 1 course by 1 faculty:

1	CE 5xxx credit hours	3
2	Number of students in class	10
3	Total credit hours for 10 students (10 students x 3 credit hours)	30
4	Tuition rate per credit hour	\$950
5	Tuition fees collected based 10 students	\$28,500
6	Return to Central Admin (20%)	\$5,700
8	Return to VCEA (80%)	\$22,800
9	Return to CEE* (73%)	\$20,805
10	Return to faculty as F&A (1/3 of 73%)	\$6,935

*if a course is offered at another campus or another program, this return will go to that campus/program (e.g. WSU-TC, or Engineering and Technology Management)

1. Operation

A faculty's regular in-classroom teaching load remains the same as before. Once an online course is developed, it needs to be offered every semester online.

		Department's Faculty support
1	Online course development (1 st semester online)	<ul style="list-style-type: none"> • One TA for one semester • Or one in-classroom course teaching load reduction
2	In-classroom course offered (future semesters) for Pullman and Tri-Cities students, including online students	If the class size is large, Department may offer a TA to the class. No faculty return.
3	Online course only (future semesters)	1/3 of return received by CEE goes to faculty as F&A+ If enrollment is more than 5, 1/3 course credit.
4	Max online course offered by each faculty per semester	One

EXHIBIT D

Budget Template (Traditional)

Civil Engineering Masters								
11/6/2020								
			1st	2nd	Nth*	1st	2nd	Nth*
			FTE	FTE	FTE	Academic	Academic	Academic
						Year	Year	Year
Total Student HDC						5	15	50
Total Student AAFTE						2	9	30
						<i>↑Enrollment values linked to Table 1↑</i>		
Personnel								
Faculty			<i>↓Insert employee FTE by job title↓</i>			<i>↓Insert annual salaries by job title↓</i>		
<Insert Job Title>			0.00	0.00	0.00	-	-	-
		Subtotal	0.00	0.00	0.00	-	-	-
Exempt								
<Insert Job Title>			0.00	0.00	0.00	-	-	-
		Subtotal	0.00	0.00	0.00	-	-	-
Classified								
<Insert Job Title>			0.00	0.00	0.00	-	-	-
		Subtotal	0.00	0.00	0.00	-	-	-
Graduate								
TA			1.00	2.00	2.00	14,166	28,332	28,332
		Subtotal	1.00	2.00	2.00	14,166	28,332	28,332
Total Personnel			1.00	2.00	2.00	14,166	28,332	28,332
Benefits						<i>↓Insert benefits based on current benefit rates↓</i>		
Faculty						-	-	-
Exempt						-	-	-
Classified						-	-	-
Graduate						1,193	2,386	2,386
Total Benefits						1,193	2,386	2,386
						Link to current benefits model rates		
Goods and Services								
Travel						-	-	-
Equipment (laptops, cameras, software)						-	-	-
Total Direct Costs						15,359	30,718	30,718
Total Indirect Costs	35%					8,270	16,540	16,540
Total Costs						23,629	47,258	47,258
One-Time Costs (course dev)					<i>User inputs one-time costs→</i>	0	0	0
Recurring Costs					<i>Formula calculates recurring costs→</i>	23,629	47,258	47,258
Total Costs						23,629	47,258	47,258
						Calculated total cost per student AAFTE:	11,814	5,251
						Calculated direct cost per student AAFTE:	7,679	3,413
								1,024
Revenue								
CEE Allocation						24,361	90,332	381,602
VCEA Allocation						2,336	8,662	36,592
Central Allocation						6,674	24,748	104,548
Total Expenses						23,629	47,258	47,258
Total Revenue (\$950 per credit)						57,000	171,000	570,000
Total Revenue less expenses						33,371	123,742	522,742

EXHIBIT E
Assessment Plan

*This is the existing assessment plan, as requested, which will be updated for the proposed online Master of Engineering.

2019 - 2020
GRADUATE PROGRAM
ASSESSMENT PLAN
Dept. of Civil and Environmental Engineering
Washington State University

Mission Statement

To provide a premier undergraduate education in civil engineering that prepares our graduates to contribute effectively to the profession and society, for advanced study, and for life-long learning; to conduct world-class disciplinary and interdisciplinary research that is integrated with both graduate and undergraduate education in selected areas of excellence; and to serve a diverse constituency through technology transfer, public service, and outreach.

Program Description

Our M.S. program offers a degree in M.S. in Civil & Environmental Engineering (currently 49 students) and a M.S. in Environmental Engineering (6 students). Our Ph.D. program offers a degree in Ph.D. Civil & Environmental Engineering (39 students) and a Ph.D. in Engineering Science (11 students). The majority of our students and faculty reside on the Pullman, WA campus. We also have a smaller program in the Tri-Cities in Washington with three faculties and 10 students (4 Ph.D. students and 6 M.S. students). Our faculty focus on four different areas: 1) hydrology (water resources and environmental); 2) structural, materials, and sustainability; 3) geotechnical and transportation; and 4) atmospheric and air quality. Degrees from our program can be interdisciplinary involving all the areas of emphasis. Some of our students went straight to graduate school after finishing their B.S. degree, some of our students enter our program with an M.S. degree, and some of our students have been in the work force for a few years. We provide an assistantship for most of our students. The corner stone of our program is the supportive faculty-student relationship

Program Objectives

To train students in Civil & Environmental Engineering to become leaders in their field and to enhance career opportunities.

Student Learning Outcomes

MASTER'S PROGRAM

Learning Outcomes

- Demonstrate the knowledge and skills that are necessary to achieve success as a practicing engineer.
 - A thorough foundation and advanced knowledge in fields of civil or environmental engineering.
 - The ability to apply their knowledge to solve novel and emerging problems in civil or environmental engineering.
 - The ability to present their knowledge through publications and oral presentations.
 - Employment in industry, consulting firms, or government agency.
 - Leadership in professional practice and service.
- Become effective researchers in civil or environmental engineering.
 - Knowledge of current state of research in selected technical areas of civil or environmental engineering.
 - Define a research problem, apply sound research methods, draw well-supported conclusions, and effectively communicate findings to problems in an areas of study.
 - Employment in industry, government agencies, or acceptance into PhD or other advance degree program.
- Engage in activities of life-long learning.
 - Engagement in continuing education and professional development.
 - Participation in professional organizations.
 - Obtained advance degree.

Ph.D. PROGRAM

Learning Outcomes

- Demonstrate the knowledge and skills that are necessary to achieve success as practitioners, teachers or researchers in civil or environmental engineering.
 - A thorough foundation and advanced knowledge in fields of civil or environmental engineering.
 - The ability to apply their knowledge to solve novel and emerging problems in civil or environmental engineering.
 - Able to teach in a variety of settings.
 - The ability to present their knowledge through publications and oral presentations.
 - Employment in industry, consulting firms, government agency, or academia.
 - Leadership in professional practice and service.
 - Apply sound research methods, draw well-supported conclusions, and effectively communicate findings.
- Become effective researchers in civil or environmental engineering.
 - Original contributions to selected technical areas in civil or environmental engineering.
 - Able to secure funds and manage resources to conduct research
- Have records of achievements that enhance the reputation and visibility of the doctoral program in civil engineering at Washington State University.
 - Hold responsible position in academia, national laboratory or industry.
 - Participation in professional organizations.
 - Recognition and awards

Use of Assessment Data

Assessment data will be used to evaluate career placement to see if it is in line with program objectives. Data will also be shared with faculty to inform new and senior faculty on the successes of the program to identify needed changes.

Ph.D. Civil Engineering Program Assessment Plan

Outcome	Data (Direct/Indirect)	Source of Data	When to Collect
<i>Demonstrate the knowledge and skills that are necessary to achieve success as practitioners, teachers or researchers in civil or environmental engineering.</i>			
<p>1a. A thorough foundation and advanced knowledge in fields of civil or environmental engineering</p> <p>1b. The ability to apply their knowledge to solve novel and emerging problems in civil or environmental engineering</p> <p>1c. Able to teach in a variety of settings</p>	Rubric to be filled out at student's final exam	Faculty members on student's graduate committee	At each final defense
1d. The ability to present their knowledge through publications and oral presentations	Graduate seminar grade and list of student presentations and publications. Rubric to be filled out at student's final exam	Faculty members on student's graduate committee	At each final defense
1d. Employment in industry, consulting firms or government agency	Placement data for graduates	Exit interviews by CEE chair	After completion of defense
1e. Employment in industry, government agency, or academia	Placement data for graduates	Exit interviews by CEE chair	After completion of defense
1f. Leadership in professional practice and service	Survey responses from graduates	Alumni survey	Conducted 5 years after graduation
<i>Become effective researchers in civil or environmental engineering.</i>			
<p>2a. Original contributions to selected technical areas in civil or environmental engineering</p> <p>2b. Able to secure funds and manage resources to conduct research</p> <p>2c. Apply sound research methods, draw well-supported conclusions, and effectively communicate findings.</p>	Survey responses from graduates	Alumni survey	Conducted 5 years after graduation
<i>Have records of achievements that enhance the reputation and visibility of the doctoral program in civil engineering at Washington State University.</i>			
<p>3a. Hold responsible position in academia, national laboratory or industry</p> <p>3b. Participation in professional organizations</p> <p>3c. Recognition and awards</p>	Survey responses from graduates	Alumni survey	Conducted 5 years after graduation

M.S. Civil and Environmental Engineering Assessment Plan

Outcome	Data	Source	Collected
<i>Demonstrate the knowledge and skills that are necessary to achieve success as a practicing engineer.</i>			
1a. A thorough foundation and advanced knowledge in fields of civil or environmental engineering 1b. The ability to apply their knowledge to solve novel and emerging problems in civil or environmental engineering	Rubric to be filled out at student's final exam (see attached)	Faculty members on student's graduate committee	At each final defense
1c. The ability to present their knowledge through publications and oral presentations	Graduate seminar grade and list of student presentations and publications. Rubric to be filled out at student's final exam	Faculty members on student's graduate committee	At each final defense
1d. Employment in industry, consulting firms or government agency	Placement data for graduates	Exit interviews by CEE chair	After completion of defense
1e. Leadership in professional practice and service	Survey responses from graduates	Alumni survey	Conducted 5 years after graduation
<i>Become effective researchers in civil or environmental engineering.</i>			
2a. Knowledge of current state of research in selected technical areas of civil or environmental engineering 2b. Define a research problem, apply sound research methods, draw well-supported conclusions, and effectively communicate findings to problems in an area of study	Rubric to be filled out at student's final defense	Faculty members on student's graduate committee	At each final defense
2c. Employment in industry, government agencies, or acceptance into PhD or other advanced degree program	Placement data for graduates	Exit interviews by CEE chair	After completion of defense
<i>Engage in activities of life-long learning.</i>			
3a. Engagement in continuing education	Survey responses from graduates	Alumni survey	Conducted 5 years after graduation

and professional development			
3b. Participation in professional organizations			
3c. Obtained advanced degree			