UW Continuum College and Civil and Environmental Engineering

New Program Information+

1. Provide a brief description (3-4 sentences) of the new program idea and include rationale for proposing – why should this program be offered?

Online Certificate in *Water Security*

Water, like many other natural resources, requires an up to date and broad-based understanding of current and emerging challenges due to, but not limited to, climate change, infrastructure design and safety, social justice, geo-politics and public health.

This online certificate program in ***Water Security*** aims to improve literacy required to understand, communicate and mitigate water security challenges that demand such broach-based attention.

Rationale:
The United Nations defines Water Security as "*The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability*." While there are several online masters or certificate program on water sustainability, there appears none that tackle **water security** from the lens of a myriad of soft or hard diverse issues of social justice, climate change, infrastructure design and safety, geo-politics, public health and the analyzing remote sensing data on water that is now freely and globally available.

The demand for such an online certificate program is particularly high in the Western US and in developing world due to the traditionally higher sensitivity to water security challenges. A survey (see appendix 1) carried out indicated that 95% of young water professionals (within 5 years of graduation) would take such an online Water Security Certificate if they had the option of taking it online and in asynchronous mode. A 100% of respondents indicated that they agree with the contents as currently organized thematically into a 9 credit hr program (see section 3) level. Many indicated a strong demand for wanting to build literacy on geo-political issues, developing coding skills for using water data and learning more about climate change challenges and environmental regulations.

2. Who is the potential target audience for the program (undergrad degree background, job titles, skills, keywords, etc.)

Professionals with undergrad degrees in engineering, such as civil and environmental, mechanical, chemical, aerospace engineering; and science fields such geoscience, earth and environmental sciences, atmospheric science, physics, and biology, liberal arts such as law, policy, economics, urban/landscape planning.

3. Are there current courses that exist in CEE that would be used for this new program? [Yellow Highlight indicates Confirmed Instructor]

1. CEWA XXX (Fall) – ***WATER REMOTE SENSING AND SOCIAL JUSTICE*** (**Objective**: To understand how remote sensing can be used as a tool to identify, quantify and explore solutions for social justice in water resources) [2 Credit Hr] Instructor**: Dr. Faisal Hossain, UW**

2. CEWA XXX (Fall) – ***WATER AND PUBLIC HEALTH*** (**Objective:** To understand public health implications of water security around the world). [2 Credit Hr] **Instructor: Dr. Ali Akanda, U Rhode Island.**
3. CEWA XXX (Winter) – ***WATER INFRASTRUCTURE SAFETY*** (**Objective:** To learn modern methods to re-evaluate water infrastructure safety in a changing climate) [1 Credit Hr] **Instructor: Dr. Faisal Hossain, UW**
4. CEWA XXX (Winter) ***INTRODUCTION TO SCIENTIFIC VISUALIZATION AND CODING*** (**Objective:** To develop coding skills to analyze water-relevant data using Google Earth Engine cloud. [1 Credit Hrs] **Instructor: Dr. Xiaodong Chen, Pacific Northwest National Laboratory, USA**
5. CEWA XXX (Spring) – ***WATER SECURITY IN PUBLIC WATER SYSTEMS*** (**Objective:** To learn current practice used in the design of water distribution systems) [2 Credit Hr] **Instructor: Zach Schremmp, P.E, RH2 Engineering.**
6. CEWA XXX (Spring) – ***WATER SECURITY AND GEOPOLITICS*** (Objective: To understand the geo-politics of water security with a focus on the Nile River Basin) [1 Credit Hr] **Instructor: Dr. Hisham Eldardiry, Pacific Northwest National Laboratory.**

4. What is the desired offering format for your idea? Certificate, MSCE PMP degree track, or new CEE degree. Why?

Online Certificate Program.

5. Will the program be offered in the Classroom, Online or Hybrid?

Fully Online. Fully Asynchronous (similar to current online Masters program in Energy Infrastructure in CEE).

The selected six courses will be designed as an online asynchronous offering. Two new courses in CEWA (#1 and #3) have already been designed in the asynchronous mode by the program coordinator. Course numbers will be applied for.

6. When would you like to launch the program?

Fall of 2024 or later.

7. What other departments might be involved, if any?

Currently none.

8. Market Research

A. SEE APPENDIX ONE ON MARKET SURVEY

B. Can you provide examples of similar or competing programs? Locally and Nationally?

Sustainable Water Management Certificate by Columbia University - https://www.sustainability.ei.columbia.edu/sustainable-water-management

The Water: Systems, Science and Society (WSSS) Graduate Certificate by Tufts University - https://environment.tufts.edu/wsss/

Water Resources Certificate by Colorado State University - https://www.online.colostate.edu/certificates/applied-global-stability/curriculum-water-resources.dot

Water Studies Online Certificate by Metropolitan State University Denver - https://www.msudenver.edu/innovative-lifelong-learning/professional-development/water-studies-online-certificate/

The Challenges of Global Water Security by Cardiff University - https://www.futurelearn.com/courses/global-water-security

Global Water Security by United Nations University - https://wlc.unu.edu/courses/course-v1:UNU-INWEH+INWEH-01+2019/about

2. Can you provide any background articles for UWC² to understand the curriculum focus?

Hydrology and Hydrodynamics research area web site gives an overview of major research topics in the program. https://www.ce.washington.edu/research/areas/water. Graduate level classes are largely related to these research areas.

Hydrology and Hydrodynamics Research Flyer:

https://www.ce.washington.edu/files/pdfs/research/Research-Area-Flyer_Hydrology-Hydrodynamics.PDF

3. Any outside research from industry or NGOs that demonstrates the need for the program? Any interested industry partners?

SEE APPENDIX ONE

4. What industries do the proposed program serve?

Water resources engineering; infrastructure planning, construction and management; regulatory agencies, green technologies; ocean engineering; environmental sciences, environmental law, environmental justice, policy, water governance, economics, finance, climate adaptation programs, international development.

5. What professional associations are associated with the proposed program?

American Society of Civil Engineers – Environmental and Water Resources Institute

American Geophysical Union

American Water Resources Association

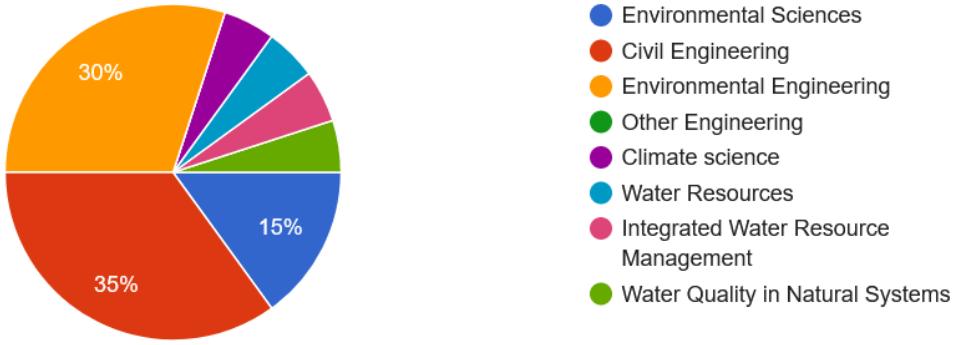
American Meteorological Society

Engineers without Borders

APPENDIX ONE: SURVEY RESULTS FOR ONLINE CERTIFICATE ON WATER SECURITY

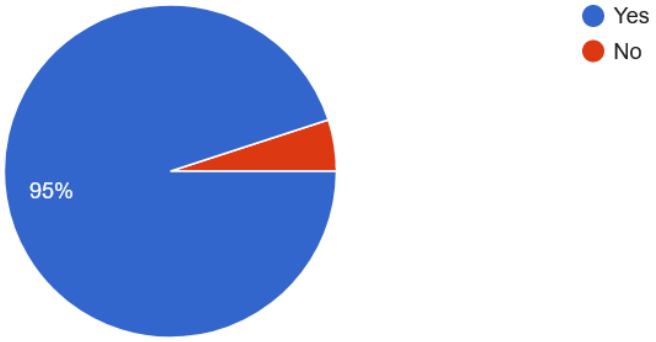
Question 1: What is your area of specialization or interest?

20 responses



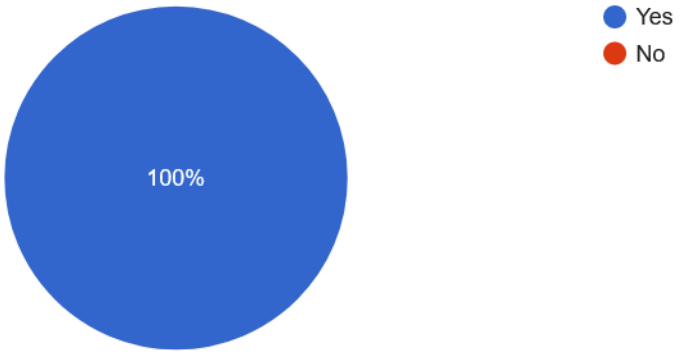
Question 2: UW is planning to start an online certificate program in "Water Security." Does such a topic interest you as part of your near-future professional development needs to keep up with the evolving nature of water practice?

20 responses



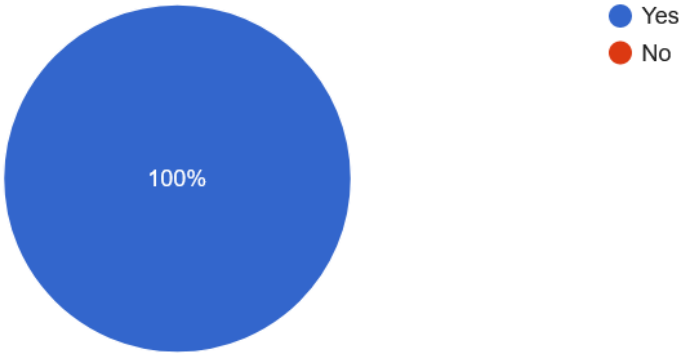
Question 3: The certificate program will involve taking 9 credit hours of coursework over a period of 9 months (3 credit hours per a 10 week quarter). Current plan is to deliver each course in a completely asynchronous mode where you can pace yourself to learn the material online and then complete assignments each week. There will be designated times to meet the instructor online and ask questions as needed. Does this asynchronous mode with the option of live interaction with instructor sound suitable for you to take the certificate?

20 responses



Question 4: The prerequisites for this certificate program is that a) you have a bachelors degree in a science, environmental or engineering related field from an accredited university OR b) you have a quantitative background or experience with data. Do you meet these prerequisites?

20 responses



Question 5: After completing the certificate, you will be able to: a) apply basic concepts of remote sensing and data to identify and characterize social justice issues in water resources (2 credit hr); b) re-evaluate water infrastructure safety in a changing climate using modern methods (1 credit hr); c) develop an understanding of messy water problems for developing communities (1 credit hr); d) understand water infrastructure projects, such as site selection, hydro-power permitting, design, construction, and maintenance (1 credit hr); e) develop awareness of environmental regulations (3 credit hr) and f) understand cyber-security issues (1 credit hr). Are these skills and understanding relevant to your near-future professional development priorities?

20 responses