Frequent Questions/Answers for University of South Florida B.S. Environmental Engineering Degree (updated September 12, 2024)

Overview. The University of South Florida (USF) B.S. in Environmental Engineering program is an ABET-accredited undergraduate STEM degree, designed to prepare graduates for high demand, well-paying jobs in Florida and beyond. Environmental engineers solve complex problems, supporting human and environmental needs while mitigating adverse environmental, health, and economic impacts associated with human activities. The 120-credit program at USF is an interdisciplinary engineering program designed to provide students with a strong foundation in both theoretical and applied aspects of environmental engineering. It emphasizes traditional areas of transport, fate, and treatment of chemical, physical, and microbial pollutants in water, air, and soil along with important 21st-century themes of infrastructure, sustainability, health, data science, community engagement, and global citizenship.

Coursework covers fundamental science and engineering concepts applied to environmental processes, natural and built environments, and engineering design, as well as applied learning experiences including community-engaged laboratory projects and a capstone design course that partners with stakeholders to solve local environmental problems.

Graduates are trained to integrate considerations of risk, uncertainty, sustainability, life-cycle principles, and environmental impacts into their problem solving, to apply concepts of professional practice and project management, and to understand the roles and responsibilities of public institutions and private organizations pertaining to environmental policy and regulations.

Graduates have local and global employment opportunities with industry, engineering design firms, local/state/federal governments, and nongovernmental organizations, along with numerous opportunities to advance their education at the Master's or Ph.D. levels.

Christine Prouty - The Faces of Environmental Engineering
https://www.youtube.com/watch?v=052FVTTfdX0

USF Alum Michael Esteban shares his experiences in the Honors College, studying abroad and more. Find out how the support he received at the University of South Florida prepared him for a career in environmental engineering. This includes his journey to his field of study and the valuable guidance he received along the way.
https://www.youtube.com/watch?v=CVV_NKR3Ce0

1) What is environmental engineering? Environmental engineering is the application of scientific and engineering principles to assess, manage and design environmental systems for the protection of human health and ecological systems. Environmental engineers integrate their knowledge of math, physics, chemistry, biology with engineering problem solving. They work on sustainability issues, provide safe drinking water, treat and properly dispose of wastes, maintain or improve air quality, perform ecological restoration of lakes and rivers, clean up contaminated land and groundwater, and help industry implement green engineering and minimize pollution, among many other activities.

2) What is the demand for environmental engineers? Florida and the world needs environmental engineers to provide economic and social opportunities for: an increasing population, reliable water and wastewater systems, improved air quality and transportation

systems, protection of public and environmental health, management of nutrient pollution that adversely impacts water bodies, ecosystem and brownfield restoration, other infrastructure improvements, advancing global health and food systems, managing wastes in a more sustainable manner, and developing strategies to mitigate global climate change.

The U.S. Bureau of Labor projects healthy growth in employment of environmental engineers and environmental health/safety engineers over the next decade. In fact, they state that employment in this area is expected to increase 7% from 2023 to 2033 (stated as faster than average) and Engineering News Record reports there is continued strength in environmental markets and top companies in that sector are expanding their global reach. U.S. News & World Report Money recently ranked environmental engineering as their #2 Best Engineering Job and has stated that "top companies in the environmental sector are expanding their global reach."

3) How many credits in the degree? At USF the degree is 120 credits.

4) What courses will I take? Environmental engineers take coursework in math, calculus based physics and chemistry like other engineers. The also take coursework in biology and the earth sciences. ABET accreditation program criteria also require they take coursework that provides a student with the ability to design environmental engineering systems (in air, water, and land) that include considerations of risk, uncertainty, sustainability, life-cycle principles, and environmental impacts, to apply concepts of professional practice and project management, and to understand the roles and responsibilities of public institutions and private organizations pertaining to environmental policy and regulations. A cumulating capstone design experiences allows students to use modern engineering techniques, skills and tools to design appropriate environmental systems to meet the needs of a local community.

This web page provides details on required and elective coursework.
https://www.usf.edu/engineering/student-services/documents/4yrplan-environmentalengineering.pdf

This webpage provides the 4-year flowchart https://www.usf.edu/engineering/student-services/documents/flowchart-bsev.pdf

Envision Sustainable Communities: Professor Maya Trotz introduces the Envision Sustainable Communities course https://www.youtube.com/watch?v=3Xy82-AyaDY

5) Can I combine this degree with the USF Honors College? Yes. Contact the Honors College to learn more how you can integrate the Honors College with the B.S. Environmental Engineering degree. https://www.usf.edu/honors/

6) Can I perform undergraduate research as part of my degree? Yes, go here for more information. https://www.usf.edu/engineering/cee/undergraduate/undergraduate-research.aspx

7) Is environmental engineering recognized as a distinct engineering discipline? Yes. Professional engineering licensure by the National Council of Examiners for Engineering and Surveying (NCEES) requires passing two examinations, the Fundamentals of Engineering (FE) exam and the Principles and Practice of Engineering (PE) exam. The FE exam is offered in six specific branches of engineering, one which is Environmental Engineering.

8) Can I still major in civil engineering with an environmental/water resources engineering track? Yes, USF's excellent Civil Engineering program has not changed and graduates from these programs are in large demand as well. And if you chose to, civil engineering graduates can enter the environmental engineering discipline with a B.S. degree in civil engineering. Also note the American Society of Civil Engineers has an Environmental & Water Resources Institute https://www.asce.org/communities/institutes-and-technical-groups/environmental-and-water-resources-institute

9) Are there any electives? Yes. Students are allowed 9 credits of unrestricted/general electives. The Department suggests students consider the following list of electives to supplement their environmental engineering knowledge.

Basic and Environmental Sciences Technical Electives:
CHM 2210 Organic Chemistry (3 credit hours)
EVR 4027 Wetland Environments (3 credit hours)
ENV 4082 Environmental Field Sampling (3 credit hours)
GLY 4734 Beaches and Coastal Environments (3 credit hours)
Critical Infrastructure Technical Electives:
CCE 4031 Construction Management (3 credit hours)
CWR 4541 Water Resources Engineering II (3 credit hours)
CWR 4625 Ecological Engineering (3 credit hours)
ENV 4351 Solid Waste Engineering (3 credit hours)
SUR 2101C Engineering Land Surveying (3 credit hours)
TTE 4003 Transportation and Society (3 credit hours)
Data Science Technical Elective:
EGN 4454 Numerical and Computational Tools II in Civil and Environmental Engineering (3 credit hours)
GEO 3164C Research Methods in Geography (3 credit hours)
GIS 3006 Mapping and Geovisualization (3 credit hours)
GIS 4035C Remote Sensing of the Environment (3 credit hours)
GIS 4043C Geographic Information Systems (3 credit hours)
Health and Safety Technical Electives:
HSC 3503 Principles of Toxicology (3 credit hours)
HSC 4213 Environmental and Occupational Risk Analysis (3 credit hours)
HSC 4430 Occupational Health and Safety (3 credit hours)
Energy Technical Electives:
EEL 4283 Sustainable Energy (3 credit hours)
ENV 2073 Global Warming: Science and Politics of a Contemporary Issue (3 credit hours)
EVR 2217 Energy, Environment and Sustainability (3 credit hours)
Global Citizens Technical Electives:
ECH 4783 Sustaining the Earth: An Engineering Approach (3 credit hours)
GEO 4340 Natural Hazards (3 credit hours)
HSC 4211 Health, Behavior and Society (3 credit hours)
HSC 4624 Foundations of Global Health (3 credit hours)
PHC 4250 Crisis Leadership in Disasters (3 credit hours)
Education Abroad Electives:
Students are able to take 3-6 credit hours of their electives through education abroad programs.

The specific education abroad course(s) must be approved in advance by the Department.

10) Is the USF Environmental Engineering program accredited by ABET? Yes! All of USF's engineering programs are currently accredited.

11) Tell me about the program's quality. Our graduate program is nationally ranked by U.S. News & World Report and the USF environmental engineering faculty are nationally/international recognized for their teaching & research excellence (see below for more information).

12) Can you provide some examples of your faculty teaching excellence? USF Environmental Engineering are authors of multiple environmental engineering textbooks (see photos below) that are used by engineering departments throughout the country and world. Our faculty have also helped develop several learning materials on sustainability (http://works.bepress.com/lvanasup/) and 24 video tutorials published at Open Education Resource (OER) Commons under "The Sustainability Learning Suites" available at http://www.oercommons.org/authoring/1660-thesustainability-learning-suites/view

Several faculty have been awarded *Outstanding Educator Awards* from the Association of Environmental Engineers & Scientists (AEESP) and the *Excellence in Environmental Engineering and Science Education Award* from American Academy of Environmental Engineers & Scientists (AAEES) for significant contribution to the environmental engineering profession in the area of educating practitioners. Faculty have also received the *William R. Jones Outstanding Mentor Award* from the Florida Education Fund for mentoring minority graduate students and an *Outstanding Mentor Award* from the Society for Advancement of Chicanos/ Hispanics and Native Americans in Science (SACNAS).

13) What else can you tell me about the national visibility of your faculty? Three faculty have been elected nationally to serve on the Board of Directors of Association of Environmental Engineers & Scientists and two have served as AEESP President. Faculty also serve as Associate Editors for the following prestigious professional journals (*ASCE J. Environmental Engineering, ASCE Journal of Sustainable Water in the Built Environment, ACS Environmental Science & Technology, ACS Environmental Science & Technology Letters*). One faculty

member also served two terms on the U.S. EPA Chartered Science Advisory Board (appointed by the EPA Administrator).

14) How about student excellence? We have a motivated, diverse, and excellent student body. We could go on and on about their many successes while at USF and after graduation. Just two examples. Teams of undergraduate students who are members of our capstone Design course have entered and regularly been awarded first and second places at state (Florida Water Environment Federation, FWEA) and national (Water Environment Federation, WEF) environmental design competitions.
https://www.fwea.org/student_design_competition.php &
https://www.wef.org/membership/students-and-young-professionals2/student-design/

In addition, to date, seven recent USF Master's students have been awarded the William Brewster Snow Award from the American Academy of Environmental Engineers & Scientists (AAEES). This award recognizes an environmental engineering graduate student who has made significant accomplishments in an employment or academic engineering project (Years 2012, 2013, 2015, 2016, 2018, and 2020. Go Bulls!

15) How do I switch majors if I am already at USF? If you are an upper level student you should see Mr. Karim Nohra in the Department of Civil & Environmental Engineering about switching majors and he is also available to assist you with questions about scheduling courses. https://www.usf.edu/engineering/cee/faculty-staff/index.aspx If you are a first-year student, you would see an advisor in Engineering Student Services https://www.usf.edu/engineering/student-services/

16) Do my two required physics courses need to be calculus based? Yes, this is a program requirement for environmental engineering programs that is required by ABET for accreditation.

17) Can I combine the degree with a Global Citizens Pathway at USF? Yes. A central theme of the program is global citizenship with concepts of global citizenship and engagement woven throughout the curriculum, including classes that are certified as USF Global Citizens' courses. The environmental engineering program is also certified as a Global Pathways degree program that provides students with significant global opportunities in and outside of their required coursework. https://www.usf.edu/gcp/being-a-global-citizen/index.aspx

18) Can I receive a Master's degree as well? Yes, USF offers excellent and ranked programs at the Master's and PhD levels in environmental engineering.
https://www.usf.edu/engineering/cee/graduate/index.aspx

19) Can I do a combined B.S./Master's degree? Yes. The Accelerated Graduate Program at USF allows academically qualified students to complete an undergraduate Bachelor's degree and a graduate degree (typically master's degree) on an accelerated timeline, graduating sooner than in traditional programs. Students maintaining a GPA ≥ 3.3 may double count six graduate level credits of coursework toward both degree programs. Students must apply no later than the beginning of their senior year.
https://www.usf.edu/engineering/cee/graduate/grad-accelerated.aspx

20) I heard you have a program that combines education with service in the U.S. Peace Corps or other international humanitarian/development agencies? Yes, we have such a

program at the graduate level. Learn more here. https://www.usf.edu/engineering/cee/graduate/grad-efd.aspx and http://cee.eng.usf.edu/peacecorps/

21) Are there any student professional groups I can join that will allow me to develop professional networks and learn more about the discipline? Yes, there are several student professional organizations at USF that are environmental engineering-focused and affiliated with local practitioners. These student organizations include the Florida Water Environment Association (FWEA), American Water Works Association (AWWA), American Association of Environmental Engineers & Scientists (AAEES), and Engineers without Borders.

22) Are there other professional societies I might consider joining while a student or after graduation? Besides the ones mentioned above, some other professional organizations that might interest you are: a) American Academy of Environmental Engineers & Scientists (AAEES) http://www.aaees.org/ b) Air & Waste Management Association https://www.awma.org c) American Society of Civil Engineers Environmental & Water Resources Institute. https://www.asce.org/communities/institutes-and-technical-groups/environmental-and-water-resources-institute d) American Public Health Association apha.org e) Solid Waste Association of North America https://swana.org and f) Florida Stormwater Association, https://www.florida-stormwater.org.

23) What are university admission requirements? Admission to USF is based on the University's Undergraduate Admission Requirements that may be found by clicking on the following URLs:

- **First Year:** https://www.usf.edu/admissions/freshmen/admission-information/requirements-deadlines.aspx
- **Transfer:** https://www.usf.edu/admissions/transfer/admission-information/index.aspx
- **International:** https://www.usf.edu/admissions/international/admission-information/index.aspx

For Admission information specific to the College of Engineering, see the information at College of Engineering.

24) What are the Environmental Engineering minimum requirements for progression in the upper division? Environmental Engineering students who have fully met the below requirements and are in good academic standing, may progress into the upper division of the major. Prior to progression into the upper division, a student may be permitted to take no more than two departmental Engineering courses. The Department may have continuation requirements that specify minimum performance standards in core Engineering courses that must be met before further registration in the Department is granted.

1. Completion of each of the following prerequisite courses with a minimum grade of a C in each course and a 3.0 GPA (based on best attempt with a maximum of two attempts):
    - Calculus I (MAC 2311 or MAC 2281) and Calculus II (MAC 2312 or MAC 2282) and Calculus III (MAC 2313 or MAC 2283)
    - Calculus-based Physics I with Lab (PHY 2048 and PHY 2048L)
    - Calculus-based Physics II with Lab (PHY 2049 and PHY 2049L)

- General Chemistry I with Lab (CHM 2045 and CHM 2045L) or (CHS 2440 and CHS 2440L)

2. A minimum overall GPA of 2.0
3. A minimum USF GPA of 2.0

25) What are the minimum continuation requirements for Environmental Engineering? Continuation requires a minimum grade of C-, as well as a 2.5 GPA (based on best attempt), for the following courses: EGN 3311 - Statics & EGN 3353 - Basic Fluid Mechanics

26) Can I transfer after receiving my A.A. degree? Students may transfer to USF after completing their A.A. degree. Some courses required for the major may also meet General Education requirements thereby transferring maximum hours to the university. If a student wishes to transfer without an A.A. degree and has fewer than 60 semester hours of acceptable credit, the student must meet the university's entering freshman requirements including ACT or SAT test scores, GPA, and course requirements. The undergraduate catalog provides more detail about this process.

28) What do environmental engineers do after graduation? Environmental engineers can do a wide range of activities upon graduating with a baccalaureate degree in environmental engineering. Some examples (there are many more) include:

- Make, interpret, and enforce environmental regulations working for local and state government or the U.S. Environmental Protection Agency.
- Restore the integrity of damaged surface waters. Examples of current projects include restoration of the Florida Everglades back to their original flow path and water quality and restoration of Gulf of Mexico Coastal Wetlands.
- Work for industry. Here students manage the operation and maintenance of a factory's pollution control equipment (water, wastewater, air), safely manage solid and hazardous waste, prevent workers from being exposed to hazardous chemicals, and work with chemical and mechanical engineers to prevent pollution and produce "green" products that are environmentally safe. They also meet with state and federal government to decide what are allowable amounts of chemicals to discharge into the environment
- Work for local and city government setting up recycling programs, operating and managing drinking water plants, wastewater plants, and landfills for our solid waste.
- Work for an engineering consulting firm designing and constructing plants to treat drinking water and wastewater and the associated sewers and water distribution systems, design systems to reuse treated wastewater and recover previous water, energy, and nutrients form waste products, predict downwind concentrations of air pollutants for companies attempting to obtain air permits, develop a solid waste management plan, clean up contaminated soil, groundwater, river and lake sediments, and restore abandoned urban sites to viable business or community green spaces.
- Implement green infrastructure and use natural methods to manage stormwater.
- Get a teaching certificate and teach K-12 science or math or environmental studies.
- Work on a Native American reservation planning, designing, and constructing water treatment and wastewater treatment units and dealing with waste management.
- Work for the U.S. Army Corps, U.S. Geological Survey, U.S. Forest Service, or Department of Interior managing our Nation's water resources, national parks, and national forests.
- Work to allocate water and preserve water quantity and quality amongst a group of stake-holders including agricultural, recreational, expanding suburbs, and nature.

- Over 2 billion people in the world do not have access to safe drinking water and improved sanitation. Billions more breathe unhealthy air. Work to solve these problems with the U.S. Agency of International Development (USAID) or nongovernmental organizations like Oxfam, Care, UNICEF, Red Cross, Doctors without Borders, WaterAid, etc.
- We know of environmental engineering graduates who go on to law school every year; they want to be environmental or patent attorneys. Some have even entered Medical School. They find that their engineering degree serves as a solid foundation for law or medicine.
- Work for an environmental group or industrial trade organization trying to influence environmental regulations and educate the public on environmental issues.
- Restore wetlands or design a system that uses natural wetlands to treat stormwater or wastewater.
- Start your own company or get your MBA and manage a large company. It seems like most big companies want one or more of their upper management to come out of the environmental area.
- Go directly on to graduate school for environmental engineering, urban planning, or environmental policy.
- Work on research with either government or industry. Some governmental options include working with NASA on global environmental problems, working with EPA on air, soil, surface water problems, working with the National Oceanic and Atmospheric Administration (NOAA) on Gulf of Mexico water issues, or working with the Department of Agriculture on protecting groundwater and lakes and rivers from pesticide and fertilizer runoff.
- Go on for your Ph.D. and become a professor at a university.

28) I loved the videos. Any other videos I can watch about USF environmental engineering students, faculty, research, and outreach?

Professor Daniel Yeh was featured (with Bill Gates) on the Daily Show for his efforts to develop and demonstrate a sanitation technology (tested in India and South Africa) that recovers safe water and fertilizer from human waste (https://www.youtube.com/watch?v=v5pW_Mqt6dU).

Professor Maya Trotz on Community Engagement and Engineering
https://www.youtube.com/watch?v=rZ-NkQ4YxtI

Discover how research spearheaded by Dr. Daniel Yeh, Professor of Civil & Environmental Engineering, is helping to solve waste and water scarcity problems around the world.
https://www.youtube.com/watch?v=J43Bz7-xtiU

See how Dr. Maya Trotz, Professor of Civil & Environmental Engineering, is engaging students in efforts that address how we live sustainably, and in particular, how we protect our waters.
https://www.youtube.com/watch?v=bPTod9rJeJQ

Dr. Trotz and students are shown in this video providing a great example of partnering with underserved East Tampa community members to install green infrastructure in their community (https://www.youtube.com/watch?v=usf8VHKQuUg).

Christine Prouty - The Faces of Environmental Engineering
https://www.youtube.com/watch?v=052FVTTfdX0

USF Alum Michael Esteban shares his experiences in the Honors College, studying abroad and more. Find out how the support he received at the University of South Florida prepared him for a career in environmental engineering. This includes his journey to his field of study and the valuable guidance he received along the way.
https://www.youtube.com/watch?v=CVV_NKR3Ce0

Award winning video by USF environmental engineering students on what you can do to reduce your environmental/carbon footprint (EESF/AEESP Video Competition)
https://www.youtube.com/watch?v=mFT3SfsfjwI

Another award winning video by USF environmental engineering students who rap about the first 50 Years of the EPA (EESF/AEESP Video Competition)
https://www.youtube.com/watch?v=PTc_wbBd9U8

Envision Sustainable Communities: Professor Maya Trotz introduces the Envision Sustainable Communities course https://www.youtube.com/watch?v=3Xy82-AyaDY

This introduction video shows a student and his research project in one of the USF Environmental Engineering labs. https://www.youtube.com/watch?v=s2ZA4M2NXWc

Join Eunyoung Lee, a postdoc student in the Civil and Environmental department, as she talks about her collaboration with the Hinkley Center for Solid and Hazardous Waste Management in the state of Florida https://www.youtube.com/watch?v=XwZzXwL85lU

Erica Dasi, a fourth-year Ph.D. candidate of Environmental Engineering at USF discusses her research on developing low-cost, simple, and efficient wastewater and drinking water purification systems. https://www.youtube.com/watch?v=toACw7Z5Tr8

Led at USF by environmental engineering and applied anthropology faculty, the Collaborative National Research Traineeship, "Strong Coasts," focuses on building a new generation of globally competent STEM practitioners and scholars. This interdisciplinary team includes anthropologists and environmental engineers from the University of South Florida, and Marine Scientists from the University of the Virgin Islands.
https://www.youtube.com/watch?v=GWx7OfBCduM

Food Water Energy Systems in Coastal Systems at USF
https://www.youtube.com/watch?v=UhWNEFY7n8Q

The Green Climate Fund and the Caribbean Community Climate Change Center
https://www.youtube.com/watch?v=miix9vw-ESE

Water Awareness Research & Education in East Tampa (see USF students working with local K-12 students) https://www.youtube.com/watch?v=Utjx8_rQKGY