2025 NHERI REU Application

2025 NSF NHERI Research Experiences for Undergraduates (REU) Application

We are excited to provide research opportunities for undergraduate students at ten multi-hazard engineering facilities during a 10-week summer research program. The National Science Foundation (NSF) Natural Hazards Engineering Research Infrastructure (NHERI) Research Experiences for Undergraduates (REU) Summer Program is dedicated to providing undergraduate college students with research experience in multi-hazard (**earthquake, wind, tsunamis, and coastal**) engineering, **post-event reconnaissance, cyberinfrastructure, simulation, data management, and social science research.** Through a hands-on, research-based project that introduces participants to a network of faculty, staff, and student engineers, scientists, and social scientists, students will understand the impact of natural hazards on society as they work to mitigate its effects. For more information about the NSF NHERI REU program please see the REU page at designsafe-ci.org/learning-center/reu/ or contact Robin Nelson at robin.nelson@utsa.edu.

The completed application and the letters of recommendation from *two* references are due by the extended deadline of **February 16, 2025, at 11:59 p.m. Central Time**. Decision notifications will be sent by the beginning of April to the email address provided in the application.

Important: It is the responsibility of each applicant to inform their *two* references about the submission deadline and ask them to complete their letter of recommendation by the extended deadline of **February 16, 2025, at 11:59 p.m. Central Time**. Incomplete applications will not be accepted.

Applicant Information

Over the next few screens please provide the required information to complete your application. Please note that your application will automatically save, and you may revisit it until February 16, 2025, at 11:59 pm CT.

Please contact Robin Nelson (robin.nelson@utsa.edu) if you have any questions or issues during the application process. She is happy to help! Good luck!!

Before you can move ahead with your application, please acknowledge our Artificial Intelligence (AI) policy.

- ○ I agree to not use Artificial Intelligence (AI) to generate content for my NHERI REU Summer Program application. I understand that using AI to generate application content may result in the removal of my application for consideration for the 2025 NHERI REU Summer Program. (4)

Legal first name

_____

Preferred first name

_____

Middle name (if applicable)

_____

Last name

_____

Address (street number, name, apartment, or suite number)

_____

City

_____

State

_____

Zip code

_____

University email address

_____

Personal email address

_____

LinkedIn social media address

_____

Preferred phone number

_____

Text messages If this is a mobile number capable of receiving text messages, you can elect to receive messages from the REU program.

- ○ Receive text messages from REU.
- ○ Do not receive text messages from REU.

Birth Date of birth (MM/DD/YYYY)

_____

Citizenship United States citizenship

*** Please note that only US Citizens and Permanent Residents are eligible to receive funding from the National Science Foundation. (See www.nsf.gov/crssprgm/reu/ for more information.)

- ○ Citizen
- ○ Permanent resident
- ○ Neither citizen nor a permanent resident

Military Service United States Military Service
Have you ever served on active duty in any branch of the United States military?

- ○ Yes
- ○ No
- ○ I do not wish to provide this information.

Discharge Under what conditions were you discharged?

- ○ Honorable discharge
- ○ Dishonorable discharge
- ○ Unknown
- ○ I do not wish to provide this information.

Higher Education

Expected primary major. All majors are welcome!

- ○ Civil Engineering
- ○ Structural Engineering
- ○ Environmental Engineering
- ○ Mechanical Engineering
- ○ Other Engineering
- ○ Computer Science
- ○ Architecture
- ○ Sociology
- ○ Environmental Studies
- ○ Geography
- ○ Social Science (Please specify the social science major in the box below.)

_____

- ○ Other (Please specify in the box below.)

_____

Expected minor or second major. All majors are welcome!

- ○ Civil Engineering
- ○ Structural Engineering
- ○ Environmental Engineering
- ○ Mechanical Engineering
- ○ Other Engineering
- ○ Computer Science
- ○ Architecture
- ○ Sociology
- ○ Environmental Studies
- ○ Geography
- ○ Social Science (Please specify in the box below.)

_____

- ○ Other (Please specify in the box below.)

_____

- ○ No minor or second major.

Graduation date When is your expected graduation date? Please use the MM/DD/YYYY format.

_____

What will be your class rank in fall 2025?

- ○ Freshman (0-29 hours/credits)
- ○ Sophomore (30-59 hours/credits)
- ○ Juniors (60-89 hours/credits)
- ○ Senior (90+ hours/credits)

Higher education institution currently enrolled in and attending

_____

Other higher education institutions (colleges) attended

_____

GPA Overall GPA (On a 4.0 scale)

_____

Quarter or Semester Credits earned by quarter or semester

- ○ Quarter
- ○ Semester

End date Spring 2025 semester ***end*** date (MM/DD/YYYY). Please consider your schedule and the site dates when selecting.

_____

Start date Fall 2025 semester ***start*** date (MM/DD/YYYY). Please consider your schedule and the site dates when selecting.

_____

References

You need to secure a commitment from two individuals who know your academic abilities and work ethic to provide letters of recommendation. *At least one reference must be a college/university faculty member.* You may also include a letter of recommendation from your academic advisor, who may or may not be a professor.

Please complete the information below for two individuals who will each need to provide a letter of recommendation and complete the recommendation form. After submitting this application, be sure that each reference submits their letter of recommendation electronically by the required extended deadline: **February 16, 2025, at 11:59 p.m. Central Time**. It is your responsibility to ask them to complete the recommendation form by the deadline. Incomplete applications will not be accepted.

First reference's name

_____

First reference's phone number

_____

First reference's email address

_____

Please describe how you know your first reference.

_____

Second reference's name

_____

Second reference's phone number

_____

Second reference's email address

_____

Please describe how you know your second reference.

_____

Special Accommodations

The questions in this section are meant to help sites better understand and prepare for a participant's special accommodations for vision, hearing, mobility, lifting, and concentrating. If you are willing to answer these questions, please select "I wish to provide this information." Otherwise, please select, "I do not wish to provide this information," and be directed beyond this section.

- ○ I wish to provide this information.
- ○ I do not wish to provide this information.

I can see words or letters in ordinary 10 pt. font print (with glasses/contact lenses if you usually wear them).

- ○ Yes
- ○ Moderately
- ○ Slightly
- ○ Barely
- ○ Unable to do

I can hear what is normally said in a conversation with another person (with a hearing aid, if you usually ear one)?

- ○ Yes
- ○ Moderately
- ○ Slightly
- ○ Barely
- ○ Unable to do

I can walk or use stairs without human or mechanical assistance.

- ○ Yes
- ○ Moderately
- ○ Slightly
- ○ Barely
- ○ Unable to do

Lifting I can lift or carry something as heavy as 10 pounds, such as a bag of groceries.

- ○ Yes
- ○ Moderately
- ○ Slightly
- ○ Barely
- ○ Unable to do

I have difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition.

- ○ Yes
- ○ Moderately
- ○ Slightly
- ○ Barely
- ○ Unable to do
- ○ Not applicable

Program Selection and Availability

The summer research program includes ten universities that have different academic schedules. For this reason, two 10-week program blocks were created. Please select the program date(s) for which your schedule permits you to work in person (M-F, 8:00 am -5:00 pm) at the host university for the entire 10-week program block. If you are available for both blocks, please select both. Otherwise, only choose the block for which you are available to be in person at the host university for the ***entire 10 weeks***.

Block 1: June 2 - August 8, 2025

- Florida International University
- Lehigh University
- University of California, Berkeley
- University of Florida
- University of Texas, Austin
    - Mobile shakers program
    - Cyberinfrastructure

Block 2: June 16 - August 22, 2025

- Oregon State University
- University of California, Davis
- University of California, San Diego
- University of Washington

Select the block(s) that your university calendar schedule permits.

☐ **Block 1:** June 2 - August 8, 2025

☐ **Block 2:** June 16 - August 22, 2025

Facility Descriptions

After carefully reviewing the NSF NHERI Experimental Facility's descriptions over the next few screens, please rank your top five facility choices. Your first choice represents the site where you would like to participate the most and the fifth choice represents a site where you would be willing to participate. Please also consider your availability to participate when selecting and ranking your top five choices.

Florida International University – Wall of Wind International Hurricane Research Center

The Wall of Wind (WOW) Experimental Facility (EF) at Florida International University (FIU) was funded by NSF to be a national facility that enables researchers to better understand wind effects on civil infrastructure systems and prevent wind hazards from becoming community disasters. The WOW EF is powered by a combined 12-fan system capable of repeatable testing

in up to 157 mph wind speeds through its flow management system. The unique advantage of the WOW EF is multi-scale (full-scale to 1:400) and high Reynolds number simulation of the effects of wind and wind-driven rain. This is accomplished using the twelve fans and a water spray system. In addition, the 16,000 sq ft. fenced-off secure area enables researchers to perform destructive tests up to category 5 Hurricane wind speeds. The WOW EF offers users a wide range of equipment, instrumentation, and experimental simulation protocols as well as a distinguished group of faculty staff and a well-trained team of technical and operations staff which allows for delivering world-class research. The NHERI WOW EF provides the following experimental capabilities:

- High-speed holistic testing at multiple scales in simulated hurricane wind speeds up to and including Category 5 Hurricane on the Saffir-Simpson scale
- Wind-driven rain simulations to study water intrusion
- Full- and large-scale aerodynamic/aeroelastic testing in the atmospheric boundary layer (ABL) flows at high Reynolds numbers
- Conventional boundary layer wind tunnel testing in flows with various exposures and with full turbulence spectrum
- Testing under extreme environments to develop innovative mitigation devices
- Destructive tests to study failure modes.

Visit fiu.designsafe-ci.org for more information on the Wall of Wind Experimental Facility.

Lehigh University - Real-time Multi-Directional Natural Hazards Simulation Facility (RTMD)

The NHERI Lehigh Real-time Multi-Directional Natural Hazards Simulation Facility (RTMD) was funded by the National Science Foundation (NSF) to be a world-class, open-access facility that enables researchers to address key research questions associated with the challenge of community resilience. The NHERI Lehigh Experimental Facility has a unique portfolio of equipment, instrumentation, infrastructure, testbeds, experimental simulation control protocols, and large-scale simulation and testing experience and know-how that does not exist elsewhere in the United States. The unique strength of the NHERI Lehigh EF is accurate, large-scale, multi-degree-of-freedom, and multi-directional simulations of the effects of natural hazard events on civil infrastructure systems (i.e., buildings, bridges, industrial facilities, etc.) with potential soil-foundation effects.

The types of laboratory simulations and tests enabled by the Lehigh EF include:

- Hybrid simulation (HS) combines large-scale physical models with computer-based numerical simulation models.
- Geographically distributed hybrid simulation (DHS) which is a HS with physical models and/or numerical simulation models located at different sites.
- Real-time hybrid earthquake simulation (RTHS) which is a HS conducted at the actual time scale of the physical models.

- Geographically distributed real-time hybrid earthquake simulation which combines DHS and RTHS.
- Dynamic testing (DT) which loads large-scale physical models at real-time scales through predefined load histories; and
- Quasi-static testing (QS) which loads large-scale physical models at slow rates through predefined load histories.

Visit lehigh.designsafe-ci.org for more information on the NHERI Lehigh Experimental Facility.

Oregon State University – O.H. Hinsdale Wave Research Laboratory

The O.H. Hinsdale Wave Research Laboratory Experimental Facility (HWRL-EF), established at Oregon State University in 1972, is a state-of-the-art coastal engineering research and education center specialized for physical model testing of coastal systems subject to the action of tsunamis created by earthquakes and storm surge and waves created by windstorms. The NHERI Experimental Facility at Oregon State University, known as the NSF NHERI Hinsdale Wave Research Laboratory (HWRL-EF), consists of two main resources to support a wide base of users: The Large Wave Flume (LWF) and the Directional Wave Basin (DWB). Both the LWF and DWB are capable of generating storm waves and tsunamis. The LWF is a two-dimensional representation of the coast (looking directly out to sea), eliminating the complexity of longshore currents and wave direction, and allowing a cross-section of test specimens to be studied at a large scale. The DWB increases the system complexity to three dimensions by extending laterally. In addition to these two resources, the NSF NHERI HWRL-EF provides standard and state-of-the-art instrumentation to assess wave conditions, velocity, and response variables such as stress, strain, load, and sediment transport (scour and erosion).

The HWRL-EF at Oregon State University supports the overall vision of the Natural Hazards Engineering Research Infrastructure (NHERI) program to increase the resilience of civil infrastructure and communities to coastal storms and tsunamis. Hurricanes and other coastal windstorms are extreme hazards with elevated surge and waves, high winds, and intense rains that threaten near-coast structures and critical lifelines such as bridges, roads, power and communication, and water supplies. Tsunamis can be triggered by seismic events, including fault displacement and landslides, and also represent extreme hazards with rapid inundation and damage.

REU Students are typically engaged in hands-on research projects at the facility, including wave-structure interaction to determine wave forces on coastal structures, tsunami and surge overland flow and impact of debris, sediment transport and scour, and engineering with nature to reduce coastal flood hazards. REU students learn skills related to laboratory testing, data acquisition and analysis, and data publishing.

Visit oregonstate.designsafe-ci.org for more information on the O.H. Hinsdale Wave Research Laboratory.

University of California, Berkeley – Computational Modeling and Simulation Center (NHERI SimCenter)

Are you interested in software that helps scientists understand how earthquakes, tsunamis, and hurricanes affect cities, helps engineers design better buildings and bridges, and helps cities plan for natural hazards? The *SimCenter* is looking for multi-disciplinary teams of students (CS, civil engineers, urban planners, and social scientists) to participate in the development, testing, and demonstration of our software. Join us in Berkeley, CA, this summer, and apply your programming skills (we're here to help you if needed) to work on an exciting, individualized project. While in the Bay Area, you'll be working with experts in software development, modeling, and machine learning to expand the computational tools and educational resources required to mitigate the effects of natural hazards on the built environment.
The *SimCenter* develops software and advances computer simulation as part of the NHERI program. We're writing new code to streamline and enhance simulation capabilities that integrate existing applications to move beyond loading scenarios of an individual building to enable the simulation of entire regions to multiple natural hazards. *SimCenter* software also addresses community risk by estimating the damage sustained by these structures and the cost and time required for repair. Ultimately, the *SimCenter* software framework will enable engineers, and students like you, to develop better models that account for uncertainty quantification and learn about the societal impacts that windstorms, earthquakes, and tsunamis pose to our cities. To realize this vision of simulation-enabled engineering, the *SimCenter* is also

creating educational modules to teach students modeling techniques and simulation skills; these educational tools will help prepare students for research and professional practice.

The *SimCenter* hosts summer interns who are interested in conducting simulation-based research. Examples of past REU projects:

- Integration of Structural Damage and Loss Data with Social Vulnerability Measures for Earthquake Hazards in the Bay Area
- Probabilistic Assessment of Earthquake Damage to a Potable Water Network in Shelby County, Tennessee
- Assessing Impacts of Traffic Network Damage from Earthquakes Using an Open Traffic Model
- A Stochastic Ground Motion Simulation Model Developed for Shallow Crustal Earthquakes Evaluated in a Subduction Zone Setting
- Regional Hazard Simulation Workflow Adaption
- Automated Model Validation of the SimCenter Regional Earthquake Workflow
- Regional Earthquake Simulation in Charleston County, South Carolina
- Evaluating Policies by Simulating Large-Scale Regional Seismic Response
- Influence of Different Building Damage Prediction Models on Regional-scale Seismic Risk Estimates
- Deep learning-based estimation of peak wind pressures on buildings from short-duration measurements
- Adaption of the PBEE Framework: A building block for community resilience models

UC Berkeley invites you to participate in *SimCenter's* efforts to advance simulation software for engineering applications with the goal of mitigating the effects of natural hazards on the built environment. Be part of this summer's team to evaluate and improve models that assess the economic impact of earthquake, wind, or water damage.

Visit https://simcenter.designsafe-ci.org for more information.

University of California, Davis - Center for Geotechnical Modeling (CGM)

The NHERI Equipment Facility at UC Davis is housed at the Center for Geotechnical Modeling (CGM). The CGM has a long history of providing users, both national and international, with access to world-class geotechnical centrifuge modeling facilities for research on the performance of soil and soil-structure systems affected by earthquake, wave, wind, and storm surge loadings. Geotechnical centrifuges enable the use of scale models to investigate nonlinear, stress-dependent responses of soil masses that are many times larger than is possible on the world's largest 1-g shaking tables. The centerpiece of our facility is one of the largest centrifuges equipped with a shaking table in the world, which enables researchers to perform experiments with a holistic level of complexity that is not possible with smaller-scale centrifuges.

The experimental facilities at UC Davis include:

1. a 9-m radius dynamic geotechnical centrifuge,
2. a model preparation room for the 9-m radius centrifuge
3. a 1-m radius dynamic geotechnical centrifuge
4. a model preparation room for the 1-m radius centrifuge
5. an electronics and calibration shop
6. the Geotechnical Modeling Facility building

Visit cgm.engr.ucdavis.edu to learn more about the facility's people, history, and vision.

University of California, San Diego – 6-DOF Large High-Performance Outdoor Shake Table (LHPOST6)

The NHERI@UC San Diego Experimental Facility provides a six-degree-of-freedom large, high performance, outdoor shake table (LHPOST6) to enable the seismic testing of large structural, geostructural, and soil-foundation-structural systems. Earthquakes have had considerable destructive effects on society in terms of human casualties, property and infrastructure damage, and economic losses. Building a multi-hazard, disaster-resilient, and sustainable environment requires the understanding and ability to predict more reliably the system-level response of buildings, critical facilities, lifelines, and other civil infrastructure systems to these extreme events. This facility tests extensively instrumented large- or full-scale structural, geotechnical, and soil-foundation-structural systems under extreme earthquake loads to help advance predictive seismic performance tools and to develop effective technologies and policies to prevent these natural hazard events from becoming societal disasters.

The LHPOST6 is composed of a steel platen that is 12.2 meters long by 7.6 meters wide and has performance characteristics that allow the accurate reproduction of near- and far-field earthquake ground motions. The facility can support the testing of large structural, nonstructural, and geotechnical systems up to a weight of 20 MN. Two large soil boxes can be used in conjunction with the shake table to investigate the seismic response of soil-foundation-structural systems. Systems tested at the facility utilize extensive data acquisition and instrumentation capabilities, including a broad array of state-of-the-art sensors and high-definition video cameras, to support detailed monitoring of the system response. This shake table facility can provide the validation tests for retrofit methods, protective systems, the use of new materials, components, systems, and construction methods for disaster-resilient and sustainable civil infrastructure.

Students working at NHERI@UC San Diego will gain hands-on experience with innovative design methods, construction techniques, sensors used to measure structural response, and basic computational modeling strategies. Students will help with the planning, preparation, and/or execution of the large- to full-scale dynamic tests.

Visit ucsd.designsafe-ci.org for more information on the LHPOST6 facility.

University of Florida – Boundary Layer Wind Tunnel Experimental Facility

The NHERI wind hazard Experimental Facility (EF) at the University of Florida enables discoveries that inform the development of wind-hazard-resilient infrastructure and communities and supports outreach focused on inclusive K-12 STEM education. The fundamental experimental need in the wind hazard space is the accurate replication of dynamic loads from extreme wind events within a flexible framework that is repeatable, scalable, and adaptable to many wind hazard scenarios and infrastructure systems. This need inspired the design, construction, and commissioning of the Self-Configuring Hybrid Boundary Layer Wind Tunnel (UF BLWT), which combines the reliability of proven experimental methods with extensive automation and new technologies to overcome discovery-prohibiting limitations of existing facilities.

The UF BLWT is currently supporting next-generation experiments that are transforming wind hazard research and a broad array of other fields. Outcomes range from applied broader impacts (e.g., improving building codes and standards and launching a wind hazard STEM training program for K-12 educators) to new intellectual contributions in fluid dynamics, computational modeling, wind science, and AI-driven real-time adaptive testing to dramatically increase the rate of discovery.

REU Opportunities
We are seeking REU students interested in experimental research in our laboratory, data analysis and computational modeling, and engineering education research. Our REU students will participate in ongoing wind hazard projects, in teams and individually. At least one REU will also contribute to K-12 STEM projects, working with teachers to integrate engineering design and inquiry in their classrooms. The ideal candidates should be passionate about project-based learning within a diverse team of students, teachers, and research staff.

Visit ufl.designsafe-ci.org for more information on the Boundary Layer Wind Tunnel Experimental facility.

University of Texas at Austin - Experimental equipment site specializing in dynamic in-situ testing using large-scale mobile shakers

The NHERI@UTexas facility houses five large-scale mobile shakers, often called “shaker trucks,” that are used for dynamic field testing of geotechnical or structural infrastructure. These shaker trucks can be used to determine subsurface soil conditions, characterize the nonlinear behavior and liquefaction potential of soils that are difficult to sample and test in a lab and determine the dynamic characteristics of existing bridges and buildings. Students working at NHERI@UTexas will learn how sensors are used to measure soil and structural vibrations for infrastructure and natural hazards engineering applications. Students may also help develop computer programs to analyze and visualize vibration data collected from physical geotechnical and/or structural tests or simulations. Depending on the scheduling of field testing over the summer, students may assist with the planning, preparation, or execution of dynamic tests of

geotechnical systems and infrastructure such as levees, buildings, or bridges.

Visit utexas.designsafe-ci.org for more information on the NHERI@UTexas facility.

The University of Texas at Austin - NHERI Cyberinfrastructure and Data Management with TACC

DesignSafe-ci.org provides a comprehensive environment for experimental, theoretical, and computational engineering and science, providing a place not only to steward data from its creation through the archive but also the workspace to understand, analyze, collaborate and publish that data. The *DesignSafe* vision is an integral part of research and discovery, providing researchers access to cloud-based tools that support their work to analyze, visualize, and integrate diverse data types. *DesignSafe* provides a flexible data repository with straightforward mechanisms for data/metadata upload and enables the next generation of research discovery through a cloud-based interface that allows data analysis and visualization tools to work directly on data stored in the data repository. These functionalities allow researchers to use the cyberinfrastructure to interact with their data in the cloud, bypassing time-consuming downloads/uploads. Software encompasses both data analytics and visualization tools (e.g., MATLAB, ParaView) as well as computational simulation tools (e.g., OpenSees, ABAQUS, ADCIRC, OpenFOAM).

Students that join the *DesignSafe* team this summer will work with the Texas Advanced Computing Center (TACC) at The University of Texas (physical REU site). Students will receive training using some of the most advanced technologies and benefit from joining a cohort of students participating in two other REU Sites at UT Austin. Students will conduct projects that focus on leveraging computational technologies to help support hazard engineering research and focus on multi-hazard risk assessment of infrastructure (e.g., bridges, roadways, and petrochemical facilities) that use and advance *DesignSafe* cyberinfrastructure tools. In addition to working directly with civil engineering researchers, students will receive ongoing mentoring from the staff at TACC on high-performance computing, cloud-based data analytics, and visualization. This unique experience will offer insight into how expertise in civil engineering and computer science can shape the future of hazard engineering research.

Visit the designsafe-ci.org/community/cyberinfrastructure/ page for more information.

University of Washington - Rapid Response Research Facility (RAPID)

The NSF-sponsored UW RAPID facility provides researchers with the equipment, software, and support services they need to collect, process, and analyze perishable data from natural hazards events such as earthquakes, hurricanes, tsunamis, landslides, and wildfires. Facility equipment includes lidar scanners, surveying equipment, a Street View system, unmanned aerial vehicles with digital cameras and/or lidar units, accelerometers, and seismometers for ground investigation as well as software (e.g., Leica and Maptek geomatics software, Pix4D) to support data processing. The RAPID has also developed a customizable survey application that

supports engineering and social science field data collection. Data collected and processed using RAPID equipment and software enable characterization of ground failure and civil infrastructure performance under natural hazard loads, evaluation of the effectiveness of current and previous design methodologies and understanding of socio-economic impacts of natural disasters.

Students who join the RAPID facility for the summer will participate in the following activities:

1. Working with a specific field data set collected by the student, RAPID staff and/or others use these data to advance understanding of infrastructure response to natural hazard events as well as to advance understanding of how post-event data can effectively be used to advance natural hazards engineering.
2. Further development of data processing protocols for RAPID users. REUs will learn how to use data processing software and then analyze and assess data products produced using RAPID instrumentation. Ultimately, REUs will contribute to the documented data processing workflows to enable RAPID users to produce high-quality datasets for specific use-case scenarios.
3. Working with RAPID staff, REUs will learn how to use RAPID equipment, investigate equipment settings and features, process data using appropriate software, and update user guides that document best practices for equipment use and data processing.
4. REUs will join RAPID facility faculty and staff in hosting the facility's annual 4-day user training workshop held on the UW campus in July. This workshop attracts faculty from across the US. REUs will participate in training activities as well as support workshop operations.

Visit rapid.designsafe-ci.org for more information on the RAPID program.

Site Ranking

Things you should consider when ranking the sites:

- What are your natural hazard research interests (earthquakes, tsunamis, storm surge, hurricane or another windstorm, etc.)?
- What are your research method interests (physical modeling, computational/simulation, hybrid simulation, survey, etc.)?
- Are you interested in engineering, social science, or some combination of both?
- Are you available to participate in the program during the site dates?

Please select a ***first, second, third, fourth, and fifth*** choice for REU sites. This will rank your interest in sites from first choice (I would really like to attend the REU program here.) to fifth choice (I can complete my REU program here.). Please also consider your availability for the summer when selecting and ranking your top five choices. ***You must be able to complete the entire 10-week program in person at the site.***

First Choice

- ○ Florida International University, WoW (June 2 - August 8, 2025)
- ○ Lehigh University, RTMD Experimental Facility (June 2 - August 8, 2025)
- ○ Oregon State University, HWRL (June 16 - August 22, 2025)
- ○ University of California - Berkeley, SimCenter (June 2 - August 8, 2025)
- ○ University of California - Davis, CGM (June 16 - August 22, 2025)
- ○ University of California - San Diego, LHPOST6 (June 16 - August 22, 2025)
- ○ University of Florida, Boundary Layer Wind Tunnel Experimental Facility (June 2 - August 8, 2025)
- ○ University of Texas - Austin, Mobile Shakers (June 2 - August 8, 2025)
- ○ University of Texas - Austin, DesignSafe with TACC (June 2 - August 8, 2025)
- ○ University of Washington, RAPID Facility (June 16 - August 22, 2025)

Second Choice

- ○ Florida International University, WoW (June 2 - August 8, 2025)
- ○ Lehigh University, RTMD Experimental Facility (June 2 - August 8, 2025)
- ○ Oregon State University, HWRL (June 16 - August 22, 2025)
- ○ University of California - Berkeley, SimCenter (June 2 - August 8, 2025)
- ○ University of California - Davis, CGM (June 16 - August 22, 2025)
- ○ University of California - San Diego, LHPOST6 (June 16 - August 22, 2025)
- ○ University of Florida, Boundary Layer Wind Tunnel Experimental Facility (June 2 - August 8, 2025)
- ○ University of Texas - Austin, Mobile Shakers (June 2 - August 8, 2025)

- ○ University of Texas - Austin, DesignSafe with TACC (June 2 - August 8, 2025)
- ○ University of Washington, RAPID Facility (June 16 - August 22, 2025)

Third Choice

- ○ Florida International University, WoW (June 2 - August 8, 2025)
- ○ Lehigh University, RTMD Experimental Facility (June 2 - August 8, 2025)
- ○ Oregon State University, HWRL (June 16 - August 22, 2025)
- ○ University of California - Berkeley, SimCenter (June 2 - August 8, 2025)
- ○ University of California - Davis, CGM (June 16 - August 22, 2025)
- ○ University of California - San Diego, LHPOST6 (June 16 - August 22, 2025)
- ○ University of Florida, Boundary Layer Wind Tunnel Experimental Facility (June 2 - August 8, 2025)
- ○ University of Texas - Austin, Mobile Shakers (June 2 - August 8, 2025)
- ○ University of Texas - Austin, DesignSafe with TACC (June 2 - August 8, 2025)
- ○ University of Washington, RAPID Facility (June 16 - August 22, 2025)

Fourth Choice

- ○ Florida International University, WoW (June 2 - August 8, 2025)
- ○ Lehigh University, RTMD Experimental Facility (June 2 - August 8, 2025)
- ○ Oregon State University, HWRL (June 16 - August 22, 2025)
- ○ University of California - Berkeley, SimCenter (June 2 - August 8, 2025)
- ○ University of California - Davis, CGM (June 16 - August 22, 2025)
- ○ University of California - San Diego, LHPOST6 (June 16 - August 22, 2025)

- ○ University of Florida, Boundary Layer Wind Tunnel Experimental Facility (June 2 - August 8, 2025)
- ○ University of Texas - Austin, Mobile Shakers (June 2 - August 8, 2025)
- ○ University of Texas - Austin, DesignSafe with TACC (June 2 - August 8, 2025)
- ○ University of Washington, RAPID Facility (June 16 - August 22, 2025)

Fifth Choice

- ○ Florida International University, WoW (June 2 - August 8, 2025)
- ○ Lehigh University, RTMD Experimental Facility (June 2 - August 8, 2025)
- ○ Oregon State University, HWRL (June 16 - August 22, 2025)
- ○ University of California - Berkeley, SimCenter (June 2 - August 8, 2025)
- ○ University of California - Davis, CGM (June 16 - August 22, 2025)
- ○ University of California - San Diego, LHPOST6 (June 16 - August 22, 2025)
- ○ University of Florida, Boundary Layer Wind Tunnel Experimental Facility (June 2 - August 8, 2025)
- ○ University of Texas - Austin, Mobile Shakers (June 2 - August 8, 2025)
- ○ University of Texas - Austin, DesignSafe with TACC (June 2 - August 8, 2025)
- ○ University of Washington, RAPID Facility (June 16 - August 22, 2025)

Please explain why you ranked the facilities as you did. Specifically, how would participating in an REU program at a facility benefit you overall? In your answer, please include how the research or methods conducted at the facilities align with your overall academic, research, and career interests.

Coursework and Skills

This section asks for you to provide insight into the courses you have taken, the areas of study covered in these courses, and the skills you possess. It also asks you to reflect on the skills you would like to develop if you are accepted into the REU program.

Engineering, Math, Computer Science & Social Science Coursework

Because NHERI focuses on natural hazards research that includes engineering, social science, and interdisciplinary aspects, please provide a list of *all* the engineering, math, computer science, and social science courses you have completed or plan to complete by June 2025 in the box below. Also, indicate all the areas of study these courses have covered.

Select *all* the engineering, math, and computer science coursework you have already completed from the list below.

- [ ] Statics
- [ ] Dynamics
- [ ] Fluid Dynamics
- [ ] Linear Algebra
- [ ] Mechanics of Materials/ Solid Mechanics
- [ ] Soil Mechanics
- [ ] Statistics
- [ ] Structural Analysis
- [ ] Wind Engineering
- [ ] None of the above

Select *all* the social science coursework you have already completed from the list below.

- [ ] Introduction to Psychology, Sociology, Political Science, or other related introductory courses
- [ ] Social Science Theory
- [ ] Social Science Research Design
- [ ] Quantitative Research Methods
- [ ] Qualitative Research Methods
- [ ] Evaluation Research
- [ ] Social Psychology
- [ ] Social Science Study of the Family
- [ ] Health and Health Care
- [ ] Race, Class, and Gender Studies
- [ ] Religion and Culture
- [ ] Sociology of Disasters or Equivalent
- [ ] Environment or Environmental Justice
- [ ] Demography and Community Trends
- [ ] Social Stratification
- [ ] Ethnic and Race Relations

☐ Other (Please specific in the box below.)

_____

☐ None of the above

Special Skills & Proficiencies

Please select *all* the skills you have experience with, including computer programming languages, foreign languages, or other special skills you possess. You can list other skills and proficiencies or provide additional information about your coding, foreign language, statistics, software and research design experiences in the next question.

- [ ] AutoCAD, SolidWorks, REVIT, etc. (i.e., engineering drawing experience)
- [ ] C++
- [ ] Coding experience (Use the Other Special Skills and Proficiencies field below to specify your coding experience.)
- [ ] Excel
- [ ] Fortran
- [ ] Instrumentation
- [ ] Laboratory experience
- [ ] MATLAB
- [ ] Python
- [ ] Statistics and research design experience (Use the Other Special Skills & Proficiencies field below to specify the statistics or design software you used.)
- [ ] Interpersonal communication skills
- [ ] Cross-cultural communication skills
- [ ] Hazards or disaster specific knowledge via coursework or fieldwork experience
- [ ] None of the above

Other Special Skills and Proficiencies

Use the field below to elaborate on any additional skills or experience, including any coding experience and foreign languages spoken. Please also include social science software experience (i.e., Stata, SPSS, Atlas.ti, Nvivo, Dedoose, etc.).

Desired Special Skills & Proficiencies

Please select *all* the skills, computing proficiencies, or other special proficiencies you ***wish to obtain*** through the summer research program. Use the provided area after the list for any additional skills you desire to gain from the program not listed.

- ☐ AutoCAD, SolidWorks, REVIT, etc. (i.e., engineering drawing experience)
- ☐ C++
- ☐ Coding experience (Use the Other Special Skills and Proficiencies field below to specify your coding experience.)
- ☐ Excel
- ☐ Fortran
- ☐ Instrumentation
- ☐ Laboratory experience
- ☐ MATLAB
- ☐ Python
- ☐ Statistics and research design experience (Use the Other Special Skills & Proficiencies field below to specify the statistics or design software you used.)
- ☐ Interpersonal communication skills
- ☐ Cross-cultural communication skills
- ☐ Hazards or disaster specific knowledge via coursework or fieldwork experience
- ☐ None of the above

Other Desired Special Skills and Proficiencies

Use the field below to elaborate on any additional skills or experience, including any coding, social science software (i.e., Stata, SPSS, Atlas.ti, Nvivo, Dedoose, etc.), or foreign languages spoken.

Essay Questions

The next three questions are essay questions that give you a chance to differentiate yourself from other applicants through your unique experiences.

*Please remember, NSF NHERI REU does not permit the use of Artificial Intelligence (AI) to generate content for NHERI REU Summer Program applications. Any use of AI to generate application content may result in the removal of your application for consideration for the 2025 NHERI REU Summer Program.

Academic and Career Goals

Please provide a brief statement (500 words or less) describing your academic and career goals and how your NHERI REU experience might benefit these goals. Why is this work important to you?

Education and Work Experience

Briefly describe (300 words or less) how your skills, education, and work experience to date have prepared you to intern in an engineering laboratory or interdisciplinary research facility.

Extracurricular Activities

Briefly describe (300 words or less) what you do outside of school. Include any volunteer work, work for pay, extracurricular activities/clubs, or other groups/organizations in which you are a member or leader.

Undergraduate Research Experience

Have you participated in an REU program or other formal undergraduate research experience outside of the classroom?

- ○ Yes
- ○ No

University's research classification or Carnegie Classifications

If you are unsure, please look up your university's Carnegie Classification by typing the city in which your university is located: https://carnegieclassifications.acenet.edu/lookup/lookup.php. Please look at the BASIC classification to determine the category of your university.

- ○ R1: Doctoral Universities – Very high research activity
- ○ R2: Doctoral Universities – High research activity
- ○ D/PU: Doctoral/Professional Universities
- ○ Other
- ○ Don't know or unsure

How did you hear about the NHERI REU program? (Please select all that apply.)

- ☐ Faculty member
- ☐ DesignSafe website
- ☐ Previous REU student
- ☐ Conference
- ☐ Social Media
- ☐ Other (Please specify in the space below.)

_____

Additional Materials

You may attach a file with additional materials for the REU selection committee's consideration, such as academic transcripts or research papers. You may only attach one file. If you have multiple files, please combine them first into a ZIP archive. **Please name the file, first_last name.** Then drag and drop your file in the space below or click "Choose File" to upload the ZIP archive or single file.

Background Information

This demographics section will help the REU program learn more about applicants and is required by the National Science Foundation. Please fill out the information to the best of your ability and level of comfort. Please select the category or categories to which you most closely identify.

Gender

_____

Preferred pronouns

_____

Race/Ethnicity (Please select all that apply.)

- ☐ American Indian or Alaska Native
- ☐ Asian or Asian American
- ☐ Black or African American
- ☐ Hispanic or Latinx
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White or Caucasian
- ☐ None of the above/ Do not wish to answer

Language Native Language (first language you learned to speak)

_____

Household income

- ○ Less than $20,000
- ○ $20,000 to $39,999
- ○ $40,000 to $59,999
- ○ $60,000 to $79,999
- ○ $80,000 to $99,999
- ○ $100,000 to $149,999
- ○ $150,000 to $199,999
- ○ $200,000 or more
- ○ Unknown/ Do not wish to answer

Household Size (number of people living in the household including applicant)

_____

First-Generation in your family to attend 4-year university.

- ○ Yes
- ○ No
- ○ Unsure

First Parent or Guardian's Relationship

- ○ Mother
- ○ Father
- ○ Stepmother
- ○ Stepfather
- ○ Guardian
- ○ No parent or guardian
- ○ Another adult

First Parent or Guardian's Relationship

- ○ Mother
- ○ Father
- ○ Stepmother
- ○ Stepfather
- ○ Guardian
- ○ No parent or guardian
- ○ Another adult

First parent or guardian's highest education level

- ○ Graduate or professional degree
- ○ Bachelor's or four-year degree
- ○ Associate or two-year degree
- ○ Some college credit without degree attainment
- ○ High school diploma or GED
- ○ Some high school, no diploma
- ○ No high school
- ○ Unknown or not applicable

Second Parent or Guardian's Relationship

- ○ Mother
- ○ Father
- ○ Stepmother
- ○ Stepfather
- ○ Guardian
- ○ No parent or guardian
- ○ Another adult

Second Parent or Guardian's Relationship

- ○ Mother
- ○ Father
- ○ Stepmother
- ○ Stepfather
- ○ Guardian
- ○ No parent or guardian
- ○ Another adult

Second parent or guardian's highest education level

- ○ Graduate or professional degree
- ○ Bachelor's or four-year degree
- ○ Associate or two-year degree
- ○ Some college credit without degree attainment
- ○ High school diploma or GED
- ○ Some high school, no diploma
- ○ No high school
- ○ Unknown or not applicable

Siblings Highest Education Level

Do you have any siblings? If so, what is the highest level of education among your siblings?

- ○ Graduate or professional degree
- ○ Bachelor's or four-year degree
- ○ Associate or two-year degree
- ○ Some college credit without degree attainment
- ○ High school diploma or GED
- ○ Some high school, no diploma
- ○ No high school
- ○ Unknown or not applicable

Applicants Highest Planned Education Level

What is the highest level of education you plan to receive?

- ○ Graduate or professional degree
- ○ Bachelor's or four-year degree
- ○ Associate or two-year degree
- ○ Some college

Ready to submit? If you are you ready to submit your NHERI REU Application, please click yes and the next arrow. *If you want to review your application, please click the back button to return to the previous pages of the application.

- ○ Yes, I am ready to submit my application.