2021 Civil & Environmental Engineering
Virtual Freshmen Open House

Saturday, April 10, 2021

<u>Faculty Panel</u> (Moderator: Professor Jian Zhang)

10:00am – 10:30am Welcome to Civil and Environmental Engineering (ET)
CEE Research Highlights (Jay, Narasimhan, Gebremichael, Stewart)
Professor Ertugrul Taciroglu, Chair
Professor Jian Zhang, Vice Chair of Undergraduate Affairs
Professor Jenny Jay, Vice Chair of Graduate Affairs
Professor Sriram Narasimhan (Structures/Geotechnical)
Professor Mekonnen Gebremichael (Water Resources)
Professor Jonathan Stewart (Geotechnical)
Professor Steve Margulis (Water Resources)
Professor Sanjay Mohanty (Environment)
Professor Mathieu Bauchy (Materials)
Professor Scott Brandenberg (Geotechnical)
Professor Jiaqi Ma (Transportation)

<u>Student Panel</u> (Moderator: Yuen Lenh)

10:30am – 11:00am Current Students Q&A
Yuen Lenh (ASCE, XE), Student Activity Highlights - ASCE
Honor Fisher (ASCE, EERI), Student Activity Highlights - Seismic Competition
Alexis Bui (ASCE), Sophia Tan (ASCE, ITE), Allison Lee (ASCE)
Jackie Lim (ASCE, EWB), Cade Luongo (ASCE, CalGeo, ITE)
Peter Lee (ASCE, CalGeo, EERI)

<u>Alumni Panel</u> (Moderator: Dr. Robert Campbell)

11:00am – 11:30am Alumni Q&A
Dr. Robert Campbell, LA County Metro
Armen Azizian, Safran Aerosystems
Benjamin Baker, Walsh/Shea Corridor Constructors
Pavlo Chrysovergis, SPC Engineering
Claire Killian, Stanford University
Paul Lee, Los Angeles Department of Water and Power
Pauline Nguyen, Craftwater Engineering
Suraj Patel, Structural Engineer, Holmes Structures

Dario Qiu, Aviation Infrastructure Engineer, HNTB
Dr. William R. Goodin, Liaison to Alumni and Industry

<u>Breakout Sessions</u> (online through Zoom)

11:30am – 12:00pm Interact with faculty, students and alumni virtually and have all your questions answered

UCLA Samueli
Civil & Environmental Engineering

Faculty Panel

Professor Jian Zhang
zhangj@ucla.edu
Vice Chair of UG
Structural/Earthquake Engineering,
Structural Mechanics

Professor Sriram Narasimhan
snarasim@ucla.edu
Structural Engineering

Professor Steve Margulis
margulis@seas.ucla.edu
Hydrology & Water Resources

Professor Scott Brandenberg
sjbrandenberg@ucla.edu
Geotechnical Engineering

Professor Ertugrul Taciroglu
etacir@ucla.edu
Chair
Structural/Earthquake Engineering,
Structural Mechanics

Professor Mekonnen Gebremichael
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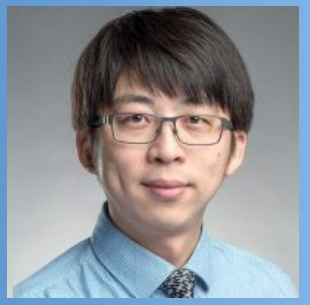
Hydrology & Water Resources

Professor Sanjay Mohanty
mohanty@ucla.edu
Environmental Engineering



Professor Jiaqi Ma
jiaqima@ucla.edu
Transportation Engineering

Professor Jenny Jay
jjay@seas.ucla.edu
Vice Chair of Graduate Environmental Engineering

Professor Jonathan Stewart
jstewart@seas.ucla.edu
Geotechnical Engineering

Professor Mathieu Bauchy
bauchy@ucla.edu
Materials

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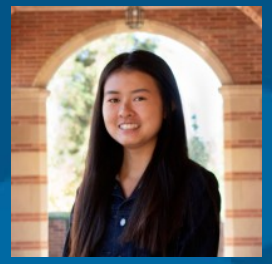
Civil & Environmental Engineering

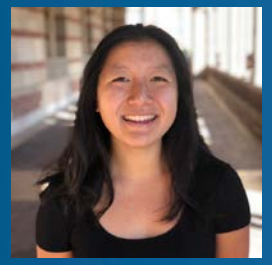
Student Panel

Alexis Bui
abui123@g.ucla.edu
Junior (3rd year)
Granada Hills, CA
CEE Focus: Structural / Geotechnical
Clubs: ASCE

Honor Fisher
hfisher303@gmail.com
Senior (4th year)
Santa Maria, CA
CEE Focus: Structural / Geotechnical
Clubs: ASCE, EERI-SEAOSC, Synthesis Dance



Sophia Tan
sophiatan2922@gmail.com
Junior (3rd year)
Alhambra, CA
CEE Focus: Transportation / Water Resources
Clubs: ASCE, ITE



Allison Lee
allee.042@gmail.com
Senior (4th year)
San Jose, CA
CEE Focus: Water Resources / Environmental
Clubs: ASCE, BHS, Cru

Jackie Lim
jackielim@g.ucla.edu
Sophomore (2nd year)
Alameda, CA
CEE Focus: Structural / Environmental
Clubs: ASCE, EWB, Den Operations, Greek Life

Yuen Lenh
y.lenh07@gmail.com
Senior (4th year)
Sacramento, CA
CEE Focus: Water Resources / Environmental
Clubs: ASCE, XE, ITE

Cade Luongo
cal22kersh@gmail.com
Senior (4th year)
Santa Clarita, CA
CEE Focus: Structural / Geotechnical / Transportation
Clubs: ASCE, CalGeo, ITE

Peter Lee
jlee6925@ucla.edu
Senior (4th year)
Pasadena, CA
CEE Focus: Structural / Geotechnical
Clubs: ASCE, CalGeo, EERI-SEAOSC, Club Archery

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Alumni Panel

Dr. Robert Campbell
Senior Manager
LA Metro
BS'07 CEE@UCLA
MS'09 CEE@UC Berkeley
PhD'12 CEE@UC Berkeley

Claire Killian
MS Student
Stanford University
BS'20 CEE@UCLA

Suraj Patel
Structural Engineer
Holmes Structures
BS'17 CEE@UCLA
MS'18 CEE@UC Berkeley

Armen Azizian
Project Engineer
Safran
BS'14 CEE@UCLA
MS'16 SE@UCSD

Paul Lee
Civil Engineering Associate
Renewable Energy
Engineering at LADWP
BS'15 CEE@UCLA

Dario Qiu
Aviation Infrastructure
Engineer
HNTB
BS'19 CEE@UCLA

Pavlo Chrysovergis
Principal Geotechnical
Engineer
SPC Engineering
BS'12 CEE@UCLA
MS'13 CEE@UCLA

Benjamin Baker, PE
Assistant Project Manager
Walsh Group
BS'10 CEE@UCLA
MS'11 CEE@UC Berkeley

Dr. William R Goodin
Liaison to Alumni and Industry
UCLA
MS'71 CS@UCLA
PhD'75 Fluid Dynamics@UC LA
MS'82 Engineering Management
@UCLA

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Civil and Environmental Engineering
Discover Engineering

April 10, 2021

Chair: Professor Ertugrul Taciroglu
Vice Chair, Undergraduate Affairs: Professor Jian Zhang
Vice Chair, Graduate Affairs: Professor Jennifer Jay

5731 & 5732 Boelter Hall
www.cee.ucla.edu

Curriculum

The civil engineering program is accredited by the Engineering Accreditation Commission of ABET. See http://www.abet.org.

The Civil Engineering major is a designated capstone major. In each of the major field design courses, students work individually and in groups to complete design projects. To do so, they draw on their prior coursework, research the needed materials and possible approaches to creating their device or system, and come up with creative solutions. This process enables them to integrate many of the principles they have learned previously and apply them to real systems. In completing their projects, students are also expected to demonstrate effective oral and written communication skills, as well as their ability to work productively with others as part of a team.

Civil Engineering B.S.
Capstone Major
Preparation for the Major
Required: Chemistry and Biochemistry 20A, 20B, 20L; Civil and Environmental Engineering 1, M20 (or Computer Science 31); Mathematics 31A, 31B, 32A, 32B, 33A, 33B (or Mechanical and Aerospace Engineering 82); Physics 1A, 1B, 1C, 4AL; one natural science course selected from Civil and Environmental Engineering 58SL, Earth, Planetary, and Space Sciences 3, 15, 16, 17, 20, Environment 12, Life Sciences 1, 2, 7A, Microbiology, Immunology, and Molecular Genetics 5, 6, or Neuroscience 10.

The Major
Required: Chemical Engineering 102A or Mechanical and Aerospace Engineering 105A, Civil and Environmental Engineering 91 (or Mechanical and Aerospace Engineering 101), 102, 103, C104 (or Materials Science and Engineering 104), 108, 110 or 111, 120, 135A, 150, 153, 190, Mechanical and Aerospace Engineering 103; three technical breadth courses (12 units) selected from an approved list available in the Office of Academic and Student Affairs; and at least eight major field elective courses (32 units) from the lists below with at least two design courses, one of which must be a capstone design course and two of which must be laboratory courses. The laboratory courses must be taken from two distinct areas. Courses applied toward the required course requirement may not also be applied toward the major field elective requirement.

Curriculum (continued)

Civil Engineering Materials: Civil and Environmental Engineering C104, C105, C106, C111, C182; laboratory course: 108L.

Environmental Engineering: Civil and Environmental Engineering 154, 155, C159, 164, M165, M166; laboratory courses: 156A, 156B; capstone design courses: 157B, 157C.

Geotechnical Engineering: Civil and Environmental Engineering 125; laboratory courses: 120L, 129L; design courses: 121, C123 (capstone).

Hydrology and Water Resources Engineering: Civil and Environmental Engineering 157A, C158; laboratory course: 129L, 157L; design courses: 151, 152 (capstone).

Structural Engineering and Mechanics: Civil and Environmental Engineering 125, 130, 135B, M135C, C137, 142; laboratory courses: 108L, 135L, 140L; design courses: 141, 143, 144 (capstone), 147 (capstone), 148.

Transportation Engineering: Civil and Environmental Engineering 180, C181, C182, C185, C186.

Additional Elective Options: Courses selected from an approved list available in the HSSEAS Office of Academic and Student Affairs. **Note:** 129L can be taken along with either 120L or 157L to satisfy the two-laboratory-course requirement.

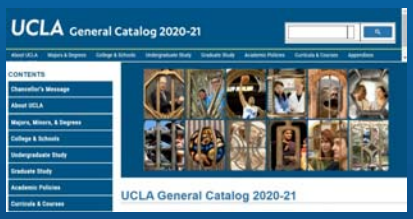
What do Civil and Environmental Engineers do?

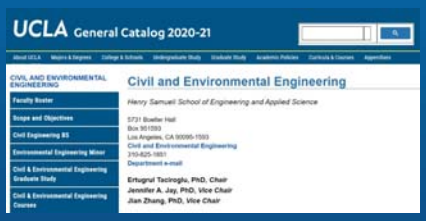
Civil and Environmental Engineers are responsible for the infrastructure that provides clean water to drink, clean air to breath, and safe buildings to live and work in. We design facilities to provide flood protection, generate and transmit energy, transport goods and people by air, rail, or roadways, and treat and dispose of waste products that would otherwise threaten our health and well-being.

Our challenge in southern California is to provide this critical infrastructure within a complex geological and climate environment prone to earthquakes, drought, flooding and landslides, while also minimizing energy consumption and the release of greenhouse gasses. We educate students to address these threats by providing sustainable infrastructure solutions.

Civil & Environmental Engineering Curriculum

April 10, 2021





http://catalog.registrar.ucla.edu/

UCLA

Curriculum (183 units)

- General education (GE) requirements (33 units)
- Preparation for the major (58 units)
- The Major (92 units)
  - *Core Major Courses (48 units)*
  - *Major Field Electives (32 units)*
  - *Technical Breadth Electives (12 units)*

Curriculum (183 units)

- General education requirements (33 units)
  - *Elementary writing (Writing I; 5 units)*
  - *Engineering ethics (Writing II; 4 units)*
  - *Foundations of knowledge (24 units):*
    - *Arts & Humanities (10 units)*
    - *Society & Culture (10 units)*
    - *Scientific Inquiry (4 units)* ☜ *automatically satisfied by the natural science requirement (see below)*

Curriculum (183 units)

- Preparation for the major (58 units)
  - *Chemistry & Biochemistry (11 units)*
  - *Introduction to Civil Engineering (2 units)*
  - *Computer Programming — Matlab or CS31(4 units)*
  - *Mathematics (24 units)*
  - *Physics (17 units)*
  - *Natural Science (~~4 units~~)*

Curriculum (183 units)

- The Major (92 units)

★ *Core Major Courses (48 units)*

- *Thermodynamics*
- *Statics and Dynamics*
- *Applied Numerical Computing*
- *Mechanics of Deformable Solids*
- *Probability and Statistics*
- *Soil Mechanics*
- *Structural Analysis*
- *Hydrology*
- *Environmental Engineering*
- *Materials Science*
- *Fluid Mechanics*
- *Professional Practice*

Curriculum (183 units)

★ *Major field electives (32 units)*

- *Specializations*
  - *Environmental Engineering*
  - *Geotechnical Engineering*
  - *Structural Engineering and Mechanics*
  - *Civil Engineering Materials*
  - *Hydrology & Water Resources Engineering*
  - *Transportation Engineering*
- *Two laboratory courses from two distinct areas*
- *Two design courses are required and one capstone design course from*
  - *123: Advanced Geotechnical Design*
  - *144: Structural Systems Design*
  - *147: Design & Construction of Tall Buildings*
  - *152: Hydraulic & Hydrologic Design*
  - *157B, 157C: Design of Wastewater Treatment Plants*

Curriculum (183 units)

… cee Teaching Laboratories

- *Structural Components & Systems Testing*
- *Structural Design & Testing*
- *Experimental Structural Mechanics*
- *Soil Mechanics*
- *Engineering Geomatics*
- *Environmental Chemistry*
- *Environmental Unit Operations & Processes*
- *Hydrologic Analysis & Design*

Curriculum (183 units)

★ *Technical Breadth Requirement (12 units)*

- *Three technical courses that are taken outside the student's major and that are not similar to courses used to satisfy the requirements of the major.*
- *Examples include*
  - *Technology Management*
  - *Nano-Technology*
  - *Bioengineering*
  - *Energy and the Environment*
  - *Geology*
  - *Urban Planning*
  - *Computer Science*
  - *See the list of approved courses at* http://www.seasoasa.ucla.edu/wp-content/uploads/seasoasa/TBA.pdf

Undergraduate Advising

- HSSEAS Office of Academic and Student Affairs (OASA) Academic Counselors
  - *They provide guidance for selecting courses, clarifying curriculum requirements, breadth requirement, etc.*

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Vanessa Hernandez
vanessah@seas.ucla.edu
6426 Boelter, (310) 825-2757

Undergraduate Advising

- Faculty Advising
  - *Students are assigned a faculty advisor upon admission to the Department.*
  - *Students must meet their advisor at least once per year, typically during Department advising week during the 2nd week of each quarter.*
  - *Purpose is to discuss big picture issues*
    - ✓ *career choice following graduation*
    - ✓ *graduate school admissions*
    - ✓ *guidance for selecting courses, clarifying curriculum requirements*
    - ✓ *research & internship opportunities*
    - ✓ *etc.*

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Student Clubs & Associations

American Society of Civil Engineers (ASCE)
http://www.ascebruins.org/
ASCE at UCLA was chartered in 1959 and since then we have made large strides to expand and develop our chapter. We currently have eleven competitive engineering and construction projects (Concrete Canoe, Steel Bridge, Seismic Design, GeoWall, Environmental Design, etc.), two dedicated community service projects and a plethora of social and professional development events year-round. This makes us not only one of the largest engineering organizations at UCLA, but also one of the most successful given our recognitions as the UCLA ESUC Best Overall Student Group, LA YMF Outstanding Student Chapter and 2nd Place in the Pacific Southwest Conference!

CA Geotechnical Engineering Association (CalGeo)
https://www.calgeobruins.org
CalGeo at UCLA is the bridge between students and professionals in the geotechnical industry. We host many events that typically include: an annual Fall BBQ, a field trip to see Cone Penetration Testing and Standard Penetration Testing, and info sessions from various companies. In addition, CalGeo participates in ASCE's GeoWall team which is a competitive project where members construct a mechanically stabilized earth (MSE) wall using poster board, construction paper, and tape to come up with the most lightweight reinforcement design to support the static load given by a competition committee. They compete at a national level through ASCE's GeoCongress and at a regional level during PSWC.

Institute of Transportation Engineers (ITE)
https://iteucla.wordpress.com/
Established in 2006, ITE at UCLA is a student branch of the professional association for Institute of Transportation Engineers. For club events, we focus on information sessions and guest speakers, and meet bi-weekly as a club. In addition, we organize field trips that will help students understand the need for transportation engineers. Furthermore, we also actively engage ourselves and encourage our members to attend conferences and industry meet-ups. We highly encourage you to attend our meetings, as you will not only expand your professional networking connections, but also broaden your exposure to the complex planning and needs in the engineering field.

Earthquake Engineering Research Institution (EERI)
http://www.uclaeeriseaosc.com
EERI-SEAOSC at UCLA is a student chapter of the Earthquake Engineering Research Institute, a professional organization dedicated to the advancement of earthquake engineering research and education regarding how best to reduce seismic hazards worldwide. Since 1999, our chapter has built a strong presence within the Civil & Environmental Engineering department at UCLA and the greater Los Angeles community. In 2019, our chapter partnered with the Structural Engineering Association of Southern California, the largest professional association for structural and earthquake engineers in Southern California, to bring added opportunities to our UCLA chapter.

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Civil & Environmental Engineering

Student Clubs & Associations

American Water Works Association (AWWA)
https://awwa-ucla.weebly.com/
AWWA at UCLA is a student run club part of the California-Nevada Section that focuses on developing young professionals in the fields of environmental and water resources engineering. We provide information sessions on engineering principles and public/private engineering firms, host field trips, and put on social functions. As water is an interdisciplinary issue involving not only engineering, but also environmental science, policy, and management, this club is open to all majors with diverse backgrounds and academic standings. Our passion is to support the professionals that provide safe drinking water to millions of people throughout the city of Los Angeles and California.

Engineers Without Borders USA (EWB)
https://www.ewb-ucla.org/
The UCLA student chapter of Engineers without Borders was founded in 2006 by a group of diverse students who were dedicated to using their education to create a lasting and positive impact in the world. Since our inception, our club has become strongly involved in several international projects in developing countries and has successfully completed two sustainable projects: building a schoolhouse in Thailand and constructing rainwater catchment systems in Guatemala. Our club currently has an ongoing project in Ethiopia and a project on the Navajo Reservation with ASCE at UCLA. Through our projects, we help our students develop their engineering skills and shape them into international humanitarians.

Chi Epsilon (XE) - https://uclachiepsilon.github.io/
As the national civil engineering honor society, Chi Epsilon is dedicated to the purpose of maintaining and promoting the status of Civil Engineering as an ideal profession. Membership of this Honor Society affords you a lifelong opportunity to continue social and professional development. Our chapter initiates qualified candidates (students in the top third of the sophomore, junior, and senior classes) twice a year into Chi Epsilon. Through this process, students participate in mock interviews for career development, professor interviews for academic development, and interact with their fellow members for social development.

Society of Women Engineers (SWE)
https://www.swe-ucla.com/
SWE-UCLA is the largest diversity oriented engineering organization at UCLA, committed to uplifting and amplifying the voices of underrepresented individuals in engineering. SWE-UCLA's various committees work hard throughout the year to offer many events like socials, company info sessions, professional workshops, Evening with Industry, QWER Hacks, and the annual Women in Engineering Stayover Program. They also have a SWE families program, specifically designed to let individuals have more peer to peer connections in the engineering school.

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Civil & Environmental Engineering

Student Clubs & Associations

National Society of Black Engineers (NSBE)
https://nsbebruins.wixsite.com/nsbe
NSBE at UCLA has been a positive and impactful force in the lives of Black Engineers and STEM students at UCLA for over 40 years. We encourage our students to excel in their academics through our NSBEmon program where students can gain points and compete to win prizes for completing academic activities. We help students professionally develop by providing networking opportunities with companies and subsidizing professional conference fees. We also foster a sense of community through weekly virtual socials where students can get to know each other better. Pre-College outreach is also an integral part of our work and allows us to positively impact the community through STEM tutoring, hands-on workshops, and our largest annual event: Women In Science and Engineering (WISE) day.

American Indian Science and Engineering Society (AISES) - https://aisesatucla.wixsite.com/aisesucla
AISES at UCLA works to reach out to the American Indian Engineering community on campus and in the Los Angeles area to provide resources and opportunities for our members to be better represented and to succeed in the STEM fields. Through the quality and reach of our social, professional development and academic programs, AISES is the leader in STEM opportunities in Indian Country. Members from over 200 tribal nations are represented within AISES, and AISES enjoys the support and partnership of corporate, government, academic, and tribal decision-makers.

Society of Latino Engineers and Scientists (SOLES) - https://uclasoles.wordpress.com/
Since 1978, SOLES has been dedicated to promoting engineering as a viable career option for Latinx students. SOLES is committed to the advancement of Latinos in engineering and science through endeavors to stimulate intellectual pursuit through group studying, tutoring, and peer counseling for all members. SOLES organizes outreach events like “Engineers in Training Day” and the “Junior Leadership Retreat” to inspire high school students from underrepresented and underserved communities to pursue STEM. The organization is committed to making a difference in the community through tutoring and mentorship. By participating in campus events such as Career Day and Engineers Week, the organization’s strong and growing membership strives to fulfill the needs of the individual and the community.

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Civil & Environmental Engineering

Instructional & Research Facilities

Instructional Laboratories


Engineering Geomatics

Engineering Geomatics
Engineering Geomatics is a field laboratory that teaches students basic and advanced geomatics techniques including light detection and range (LIDAR) imaging, georeferencing using total station and differential global positioning system (GPS) equipment, and integration of measurements with LIDAR mapping software and Google Earth. Experiments are conducted on campus.

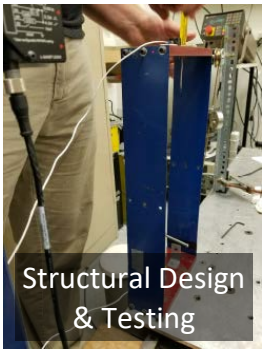

Environmental Engineering

Environmental Engineering Laboratories
The Environmental Engineering Laboratories are used for the study of basic laboratory techniques for characterizing water and wastewaters. Selected experiments include measurement of biochemical oxygen demand, suspended solids, dissolved oxygen hardness, and other parameters used in water quality control.


Hydrology Laboratory

Hydrology Laboratory
The Hydrology Laboratory is used for studying basic surface water processes and characterizing a range of geochemical parameters. Basic experiments include measurements of suspended solids, turbidity, dissolved oxygen, sediment distributions, and other basic water quality constituents. The laboratory also includes an extensive suite of equipment for measuring surface water processes in situ, including precipitation, stage height, discharge, channel geomorphology, and other physical parameters.

Soil Mechanics Laboratory
The Soil Mechanics Laboratory is used for performing experiments to establish data required for soil classification, soil compaction, shear strength of soils, soil settlement, and consolidation characteristics of soils. Students visit the Advanced Soil Mechanics Laboratory for demonstration of cyclic soil testing techniques, including triaxial and direct simple shear, and advanced data acquisition and processing.


Structural Design & Testing

Experimental Structural Mechanics Laboratory
Lectures and laboratory experiments in various structural mechanics testing of metals (steel, aluminum, brass), high-strength plastics, and concrete (cylinders, beams) using direct tension, direct compression, beam bending, and ultrasonic nondestructive evaluation.

Structural Design and Testing Laboratory
The Structural Design and Testing Laboratory is used for the design/optimization, construction, instrumentation, and testing of small-scale structural models to compare theoretical and observed behavior. Projects provide integrated design/laboratory experience involving synthesis of structural systems and procedures for measuring and analyzing response under load.

Structural Components and Systems Testing Laboratory
Comparison of experimental results with analytical results and code requirements to assess accuracies and limitations of calculation procedures used in structural design. Experiments include quasi-static tests of structural elements (beams, columns) and systems (slab-column, beam-column) and dynamic tests of simple building systems. Quasi-static tests focus on assessment of element or subsystem stiffness, strength, and deformation capacity, whereas dynamic tests focus on assessment of periods, mode shapes, and damping.


Structural Components & Systems

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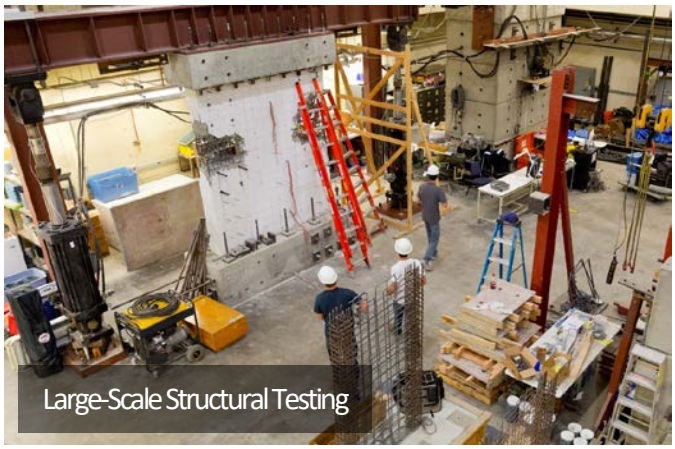
Civil & Environmental Engineering

Instructional & Research Facilities

Research Laboratories

Large-Scale Structural Testing Facility

The Large-Scale Structure Test Facility allows investigation of the behavior of large-scale structural components and systems subjected to gravity and earthquake loadings. The facility consists of a high-bay area with a 20 ft. x 50 ft. strong floor with anchor points at 3 ft. on center. Actuators with servohydraulic controllers are used to apply monotonic or cyclic loads. The area is serviced by two cranes. The facilities are capable of testing large-scale structural components under a variety of axial and lateral loadings. Associated with the laboratory is an electrohydraulic universal testing machine with force capacity of 100 tons. The machine is used mainly to apply tensile and compressive loads to specimens so that the properties of the materials from which the specimens are made can be determined. It can also be used in fatigue-testing of small components.


Large-Scale Structural Testing

Experimental Mechanics Laboratory

The Experimental Mechanics Laboratory supports two major activities: the Optical Metrology Laboratory and the Experimental Fracture Mechanics Laboratory. In the Optical Metrology Laboratory, tools of modern optics are applied to engineering problems. Such techniques as holography, speckle-interferometry, Moiré analysis, and fluorescence-photo mechanics are used for obtaining displacement, stress, strain, or velocity fields in either solids or liquids. Recently, real-time video digital processors have been combined with these modern optical technical techniques, allowing direct interfacing with computer-based systems such as computer-aided testing or robotic manufacturing. The Experimental Fracture Mechanics Laboratory is currently involved in computer-aided testing (CAT) of the fatigue fracture mechanics of ductile material. An online dedicated computer controls the experiment as well as records and manipulates data.


Environmental Engineering

Environmental Engineering Laboratories

The Environmental Engineering Laboratories are used for conducting water and waste-water analysis, including instrumental techniques such as GC, GC/MS, HPLC, TOC, IC, and particle counting instruments. A wide range of wet chemical analysis can be made in this facility with 6,000 square feet of laboratory space and an accompanying 4,000-square-foot rooftop facility where large pilot scale experiments can be conducted. Additionally, electron microscopy is available in another laboratory. Recently studies have been conducted on oxygen transfer, storm water toxicity, transport of pollutants in soil, membrane fouling, contaminant removal from water, and computer simulation of a variety of environmental processes.

Soil Mechanics Laboratory

The Soil Mechanics Laboratory is used for standard experiments and advanced research in geotechnical engineering, with equipment for static and dynamic triaxial and simple shear testing. Modem computer-controlled servo-hydraulic closed-loop system supports triaxial and simple shear devices. The system is connected to state-of-the-art data acquisition equipment. The laboratory also includes special simple shear apparatuses for small-strain static and cyclic testing and for one-dimensional or two-dimensional cyclic loading across a wide range of frequencies. A humidity room is available for storing soil samples.

Laboratory for the Chemistry of Construction Materials/Laboratory for the Physics of Amorphous and Inorganic Solids

The Physics of Amorphous and Inorganic Solids Laboratory (PARISlab) is used to connect atomistic modeling to macroscopic properties of materials of engineering interest, with a focus on non-crystalline materials (formed by quenching, irradiation, sol-gel, or impurities doping). The laboratory has a strong expertise in computational methods (DFT, molecular dynamics, mesoscale modeling, continuum methods) with an access to dedicated nodes on a state-of-the-art computing cluster. The laboratory also includes equipment for glasses synthesis, structural characterization, and mechanical testing. We work in close collaboration with the Laboratory for the Chemistry of Construction Materials (LC2). More information on the lab can be found at: https://www.lcc-ucla.com/ and http://www.lab-paris.com/

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Instructional & Research Facilities

Sensing & Robotics for Infrastructure lab (SRI)

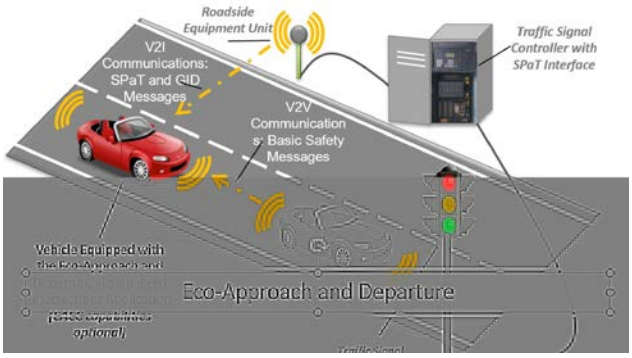
Sensing and Robotics for Infrastructure lab, SRI's overarching research goal is to better understand and quantify intelligent use of sensors and data. In pursuit of this, we are pioneering sensing systems that can measure the state of infrastructure non-destructively above and below ground as well as in aquatic environments. In addition, we are developing analytical and algorithmic tools needed to process, interpret and transform sensor data into actionable information. You will find here information regarding the ground-based and water-based robots we have developed which can enable a wide range of inspection related tasks for civil infrastructure, a novel IoT inspired leak detection system for water distribution networks and signal processing algorithms to enable condition assessment of rotating machinery and bridges using vibration data. More information about the lab can be found at: https://sri-lab.seas.ucla.edu/

Water Technologies Lab

We are interested in the development and testing of innovative water treatment technologies. We emphasize new materials and innovative approaches in our quest to solve water quality and quantity issues. In addition, we are interested in industrially important separation processes with active programs in protein and gas separations. More information about the lab can be found at: https://davidjassby.wixsite.com/david-jassby

UCLA Mobility Lab

The UCLA Mobility research lab is dedicated to harnessing system theories and tools, such as artificial intelligence, control theory, robotics, machine learning, and optimization, to innovate and develop advanced solutions for smart cities, particularly intelligent vehicular and transportation systems. Extensive research has been conducted, with the support from government agencies (e.g., U.S. DOT, state DOTs, National Science Foundation), and private sectors, in improving transportation system performance with advanced technologies and management solutions. We leverage the university environment and work with external partners to perform research and development and prepare future workforce for competitive advantage in the following areas: 1) Advanced vehicular technologies, vehicle automation, and electrification 2) Urban analytics for future mobility and smart cities and 3) Resilient, secure, smart transportation and logistics infrastructure. More information about the lab can be found at: https://mobility-lab.seas.ucla.edu/



Engineered Critical Zone Laboratory

Earth's critical zone is the permeable layer (or the Earth's skin) that extends from the tree top to the bottom of groundwater. Interactions among different components in the critical zone such as rocks, soil, water, air, microbial community, and plants help sustain life on the Earth and keep our environment clean. Our group is focused on the fundamental physical, geochemical, and biological processes that affect contaminant removal in the critical zone, particularly subsurface soil. We apply the knowledge of subsurface processes to develop engineering methods to increase natural removal rates of contaminants from soil and water. Our projects are helpful in developing strategies for the protection and management of land and water resources and to minimize community exposure to various types of chemical and biological contaminants. We use tools such as field observation, manipulative field experiments, bench and pilot scale laboratory experiments, and geochemical and spectroscopic techniques. For details about our current and past research studies, visit the Research page.

Additive Manufacturing and MetaMaterials Laboratory

The lab develops additive manufacturing (3D printing) technologies and material synthesis to create multi-functional materials and device systems with controlled micro-architectures and encoded properties. Their research combines optics, mechanics and material science to develop new materials and additive manufacturing approaches for applications in intelligent materials and structures, energy, robotics, communications and healthcare. The lab's research focus is on 1) Additive Manufacturing (3D Printing technologies) 2) Design for mechanical and functional metamaterials 3) Design and novel fabrication of transducers, electronic, and robotic devices. More information about research in this lab can be found at: https://www.raynexzheng.com/research