By the Numbers

2
National Ranking in Ph.D. Graduates Per Faculty Member Per Year*

18
Ladder Faculty

3
Faculty Added in 2014-15

1544
Freshman Applicants for 2014-15

26
Ph.D. Graduates 2013-14

2
Affiliated NAE members

63
Freshman Enrollees for 2014-15

*Based on 2010 National Research Council data
Thank you for taking a few moments to read our Fall 2014 newsletter.

I am delighted to report that three new faculty have joined our department – Mathieu Bauchy and Henry V. Burton as assistant professors, and Michael J. McGuire as an adjunct professor.

Drs. Bauchy and Burton were appointed based on their extraordinary academic and professional records, but also to grow the department in strategically vital areas related to next-generation, high-performance civil engineering materials and multi-scale seismic risk mitigation for structures and communities. Dr. McGuire is internationally renowned for seminal contributions to water treatment. He is also a member of the National Academy of Engineering.

Our continuing faculty had an exceptionally productive academic year in 2013-2014, graduating 26 Ph.D. students. This rate of 1.6 Ph.D.s/faculty member is remarkable. To place the number in context, consider that the five top CEE programs in the nation, on average about .33 Ph.D.s/faculty member. Programs average about .75 Ph.D.s/faculty member. Programs U.S. News & World Report place the number in context, consider that the five top CEE programs ranked average about .75 Ph.D.s/faculty member. Programs ranked from 6 to 30 by average about .33 Ph.D.s/faculty member, according to National Research Council data. The takeaway: UCLA is consistently among the top, and for 2014 was likely the top, graduate research program in the U.S. as measured by Ph.D. productivity.

Thes...
Margulis Writes the Book on HYDROLOGY

Open access e-text includes multimedia features, computational tools

Professor Steven Margulis has never found the perfect text for his Introduction to Hydrology course. So he wrote the book himself, publishing the open-access e-text “Introduction to Hydrology” in July.

The text has received a warm reception. First, Margulis’ students offered positive feedback as he assembled and used parts of the book in his courses over the past two years. Now, faculty at more than a dozen other universities — including the Massachusetts Institute of Technology, the Georgia Institute of Technology, two other UC campuses and Denmark Technical University — are using the book as required reading or reference material.

“Keeping it open access serves a few purposes,” Margulis said. “First, textbooks are expensive for students, so making the material accessible via a free download is helpful. In addition, the agencies that fund our research want us to contribute to undergraduate learning in important ways, and this helps serve that purpose.”

Weather Service and the non-profit University Corporation for Atmospheric Research.

One novel aspect of the book is an accompanying Modular Distributed Watershed Educational Toolbox (for use in a MATLAB environment), which integrates concepts introduced in the text with computational tools that can be applied to a range of engineering problems, including modeling of watersheds and solar energy experiments.

A link to “Introduction to Hydrology” can be found at the Margulis Research Group site, aqua.seas.ucla.edu/teaching.html.

Margulis, who joined the UCLA faculty in 2002, also said the open-access strategy is helpful for incorporating multimedia features from sources including the COMET program established by the National Weather Service and the non-profit University Corporation for Atmospheric Research.

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Steven Margulis

UCLA Contributes to U.S. Seismic Hazard Maps

UCLA CEE researchers and alumni played a significant role in developing the National Seismic Hazard Maps released by the U.S. Geological Survey in 2014.

The maps display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy.

The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquake sources and associated ground shaking obtained from the best available science and engineering models. These models were vetted through public workshops involving hundreds of participants and were reviewed by several science organizations and state surveys. Advice was also sought from expert panels and a steering committee.

As a result of this work, it is no exaggeration to state that virtually any structure designed and constructed in the western U.S. — and soon throughout the U.S. — will be positively influenced by research conducted by UCLA CEE alumni and faculty.
Inside the Industry Advisory Board

Q: What do you see as emerging directions in civil and environmental engineering?
Lew: When I entered UCLA as a freshman back in 1967, it seemed like civil engineering was a static science. All the formulae and procedures were set. Now I see the pace accelerating. There have been great developments in understanding behavior of soils and construction materials such as timber, steel and concrete. Modeling methods are being refined. There is more interaction between civil engineers and other professions, making interdisciplinary work a necessity; civil engineers need to understand how their discipline interacts with the environment and communities. I think this may be the big challenge for research in the future.

In addition, seismic engineering is an increasing global need. There is a great migration of population worldwide to ever-increasing mega-cities. Many of these mega-cities are located in areas that are vulnerable to all types of natural hazards, including earthquakes. The real challenge for reducing the hazards will be to implement multi-disciplinary solutions; there is too much fragmentation because of discipline or geography.

Q: Why did you become involved in the IAB?
Lew: My primary intention was to be a positive influence in helping the department advance. The IAB provides valuable feedback to the CEE Department about the needs of the industry, but it also gives industry the connection to the CEE Department.

Q: What are the benefits of the IAB to your company and the school?
Lew: AMEC is a big international company, and it is important for AMEC to be connected to the academic community at each of its locations. Not just to faculty, but also to the students who will become our engineering leaders.

We have arranged for students to take field trips to construction sites that give them insight into how design and analysis culminates in building and successful completion. We have supported activities such as the EERI Undergraduate Seismic Design Competition (where UCLA finished in first place two years in a row). AMEC has offered internships to CEE students and supported activities such as the EERI Undergraduate Seismic Design Competition (where UCLA finished in first place two years in a row). AMEC has offered internships to CEE students and has hired CEE graduates who have contributed greatly to the success of our company. We have also had opportunities to work with UCLA faculty in consulting roles, where their expertise and knowledge has been successfully applied in practice.

As a variety of firms are represented on the IAB, the students and faculty have many available resources beyond UCLA.

Q: In what ways has UCLA’s CEE Department changed since you were here as a student?
Lew: I’m almost afraid to admit that when I attended UCLA there was no Civil and Environmental Engineering Department. There was a unified undergraduate engineering curriculum with a breadth of courses including electronics, mechanics, thermodynamics and computer science, as well as civil engineering. It wasn’t until graduate school that I became more “civil” with the help of Professors Gary Hart, C. Martin Duke, Ken Lee and Stanley Dong, to mention only a few.

Today the CEE Department is focused on providing the fundamentals of civil engineering to undergraduate students. Faculty are on the leading edge of technology, but are well rooted in the fundamentals. The UCLA CEE Department is a research powerhouse that has changed practice and influenced building codes, its work not just dead-ending in technical papers found in little-read journals. I feel justified to be proud that I graduated from UCLA. Go Bruins!

R: What potential areas of study do you see for a developing CEE student in the next five years?
Lew: Pacific earthquakes and tsunamis are an increasing global need. I think this may be the big challenge for research in the future.

Lessons from the Northridge Quake

Professor John Wallace speaks during the Northridge 20 Symposium at UCLA in January 2014.

The event, which was held on the 20th anniversary of the magnitude 6.7 Northridge Earthquake, drew hundreds of earthquake engineers, policymakers and others to share information about seismology, building safety and design, emergency preparedness and more.

Graduate student researcher Meng Wang and Assistant Professor Shaily Mahendra.
### Civil and Environmental Engineering Ph.D. Graduates 2013-14

<table>
<thead>
<tr>
<th>Name</th>
<th>Faculty Advisor</th>
<th>Thesis</th>
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<tr>
<td>Kamil Bekir Afacan</td>
<td>Scott Brandenberg</td>
<td>Evaluation of Nonlinear Site Response of Soft Clay Using Centrifuge Models</td>
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<td>Muhammad Ghulam Bark</td>
<td>Terri Hogue</td>
<td>Estimates of Evapotranspiration for Hydrologic Modeling in the Upper Colorado River Basin</td>
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<td>Manuela Grootto</td>
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<td>Christopher William Hilson</td>
<td>John Wallace</td>
<td>Studies of Reinforced Concrete Structural Wall Boundary Elements</td>
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<td>Seongwon Hong</td>
<td>Jan-Wen “Woody” Ju</td>
<td>Self Healing Formulations for Bituminous Composites</td>
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<td>Catalina Marambio Jones</td>
<td>Eric Hook</td>
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<td>Kristjan Imre Kolozvari</td>
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<td>Modeling of Cyclic Shear-Flexure Interaction in Reinforced Concrete Walls</td>
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<td>Dong Youp Kwik</td>
<td>Scott Brandenberg and Jonathan Stewart</td>
<td>Probabilistic Evaluation of Seismic Levee Performance</td>
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<tr>
<td>Shih-Po Lin</td>
<td>J.S. Chen</td>
<td>Computational Framework for Stochastic Micro-Cracks Informed Damage Model</td>
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<td>Tiffany Yi-Ling Lin</td>
<td>Jennifer Jay</td>
<td>Effects of Bacterial Growth and Aquaculture Practices on Mercury and Arsenic Contamination</td>
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<td>Sami Maalouf</td>
<td>William W-G Yeh</td>
<td>Planning and Design of Desalination Plant Effluent Systems</td>
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<td>Camille Marodon</td>
<td>J.S. Chen</td>
<td>Methods for Meshfree Approximation of Problems with Singularities and Discontinuities</td>
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<td>Caroline Mini</td>
<td>Terri Hogue</td>
<td>Residential Water Use and Landscape Vegetation Dynamics in Los Angeles</td>
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<td>Christopher Mottier</td>
<td>John Wallace</td>
<td>Large-Scale Testing of Steel Reinforced Concrete Coupling Beams in Shear Walls</td>
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<td>Kartiki Shirish Naik</td>
<td>Michael Starstrom</td>
<td>Decentralized Wastewater Management for Improved Public Health Protection and Reclamation</td>
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<td>Mary Theresa Monahan Pendergast</td>
<td>Eric Hoek</td>
<td>Self-Assembled Materials as Novel Nanotechnology-Enabled Ultrafiltration Membranes</td>
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<tr>
<td>Peeraspong Pornwongthong</td>
<td>Shaily Mahendra</td>
<td>Stable isotopic and Molecular Biological Tools to Validate Biodegradation of 1,4-Dioxane</td>
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<tr>
<td>Edward Thomas Rentert</td>
<td>Scott Brandenberg and Jonathan Stewart</td>
<td>Shake Testing of a Model Levee on Peaty Organic Soil in the Sacramento-San Joaquin Delta</td>
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<tr>
<td>Vincent C. Reyes</td>
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<td>Differential Response of Environmentally Relevant Microorganisms to Metal Nanomaterials</td>
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<td>Michael Jason Roth</td>
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<td>A Reproducing Kernel Particle Formulation for Modeling Shock Effects in Nonlinear Solids</td>
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<td>J. C. Sabatino</td>
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<td>Seismic Responses and Protection of Building Systems</td>
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<td>Vanossu Thulking</td>
<td>Jennifer Jay</td>
<td>Evaluation of Methods for Tracking Sources of Fecal Pollution in Coastal Watersheds</td>
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<td>Jinwen Wang</td>
<td>Eric Hoek</td>
<td>Removal of Trace Organic Pollutants by Nanofiltration and Reverse Osmosis Membranes</td>
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<td>Yu-Kai Wang</td>
<td>Jan-Wen “Woody” Ju</td>
<td>Multi-Level Micromechanical Modeling of Bone Tissues</td>
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<td>Yi Wu</td>
<td>Jan-Wen “Woody” Ju</td>
<td>Micromechanical Damage Models for Continuous Fiber Reinforced Composite Materials</td>
</tr>
<tr>
<td>Wang Xi</td>
<td>Jian Zhang</td>
<td>Performance-based Implementation of Seismic Protective Devices for Structures</td>
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### CEE STUDENT CLUBS ENHANCE THE UCLA EXPERIENCE

**American Society of Civil Engineers (ASCE)**

**President:** Max Amassa

2013-2014 was a big year for ASCE. To list just a few accomplishments: We increased membership to finally break the 200-member mark, earned honors as UCLA Engineering’s “Large Engineering Club of the Year,” and took second place in the ASCE Pacific Southwest Conference Environmental Design Competition. This year, we look forward to getting all civil engineers engaged in their major through our projects, professional development events and social activities.

**California Geoprosfessionals Association (CalGeo)**

**President:** Clint Bannour

In the 2013-2014 academic year, CalGeo at UCLA increased its membership to include more than 40 undergraduate and graduate students from civil engineering, geology and engineering geology majors. CalGeo at UCLA also organized its sixth annual Geo-Expo, which was attended by more than 40 guests from industry. In the upcoming year CalGeo at UCLA plans on having a larger presence with the CalGeo parent organization and at Los Angeles Geo-Institute professional development events.

**Chi Epsilon (XE)**

**President:** Michael Tsai

The four pillars of Chi Epsilon, the Civil Engineering Honors Society, are: Character, Scholarship, Practicality, and Sociability. Chi Epsilon offers opportunities for students to learn topics not taught in school, including: Wood Design, AutoCAD, Construction Management, and FE Exam Preparation. Chi Epsilon has a wealth of resources for all engineers who want to pursue a graduate-level education or develop marketable skills in today’s industry.

**Earthquake Engineering Research Institute (EERI)**

**President:** Ben Turner

Following victories in 2012 and 2013, our undergraduate seismic design competition team competed at the annual EERI meeting in Anchorage, Alaska, this summer and performed very well. The EERI student chapter reconvened this spring to elect a new board of officers. In the upcoming year we plan to host several guest speakers and are planning workshops on seismic retrofitting and post-earthquake reconnaissance. [http://www.studentgroups.ucla.edu/eeri/](http://www.studentgroups.ucla.edu/eeri/)

**GI-GSO**

**President:** Ben Turner

In 2013-14, the UCLA Geotechnical Graduate Students Organization, which is sanctioned by the ASCE’s Geo-Institute, hosted several guest speakers, field trips and social events that were well attended by both undergraduate and graduate students. For the upcoming year, the group plans to continue these activities and begin a monthly round-table discussion session where graduate students can share their work.

**Institute of Transportation Engineers (UCLA ITE)**

**President:** Casey Tona Le

UCLA ITE is a great resource for students to get hands-on experience with and exposure to the transportation industry, as well as on-going transportation projects. In 2013-14, we had a strong turnout of students and faculty for our Ridershare Panel, which included representatives from companies including Uber and Sidecar. This year, we plan more events to connect students to industry and will assist with UCLA’s Civil Engineering career fairs.
Yacov Haimes Named CEE DISTINGUISHED ALUMNUS

University of Virginia Professor Yacov Y. Haimes (MS ’67, PhD ’70) has been named the UCLA Civil and Environmental Engineering Department Distinguished Alumnus of the Year for 2014.

Haimes is the L.R. Quarles Professor of Systems and Information Engineering and the founding director of the Center for Risk Management of Engineering Systems at the University of Virginia. After earning a Ph.D. with distinction from UCLA, Haimes joined the faculty at Case Western Reserve University, where he later chaired the Systems Engineering Department. As an American Association for the Advancement of Science-American Geophysical Union Congressional Science Fellow in 1977-78, Dr. Haimes served in the White House Office of Science and Technology Policy and on the House of Representatives’ Science and Technology Committee. Haimes joined the faculty at the University of Virginia in 1987.

He is a fellow of seven societies: AAAS, the American Society of Civil Engineers, IEEE, the International Council on Systems Engineering, the American Water Resources Association, the International Water Resources Association and the Society for Risk Analysis, where he is a past president. He has authored or co-authored seven books, and is the recipient of numerous awards and honors, including the SRA 2010 Distinguished Educator Award and the 1997 Warren A. Hall Medal, the highest award presented by Universities Council on Water Resources.

“Dr. Haimes has been a leader in the application of systems analysis methods to infrastructure problems for over 40 years,” said William W-G Yeh, the Richard G. Newman AECOM Distinguished Professor of Civil Engineering at UCLA. “One particularly noteworthy accomplishment is his pioneering work (with Warren Hall) on the development of the surrogate worth trade-off method for multiobjective analysis, which is well known worldwide for water resources planning and management.”

In 2013, the Distinguished Alumnus Award was shared among two alumni – Soroosh Sorooshian MS ’73, PhD ’78, a distinguished professor at UC Irvine; and Robert Englekirk, MS ’65, PhD ’78, founder and chairman emeritus of Englekirk Institutional.

CEE Professor Eric Hoek saw his nano-composite, reverse-osmosis membrane technology go from inspired idea to venture-backed startup company in 2007. This year he saw the company, NanoH2O Inc., acquired for more than $200 million by Seoul, South Korea-based LG Chem.

Hoek is now at work on another start-up, Water Planet Engineering. Water Planet is commercializing a new polymeric-ceramic membrane – developed by Hoek and Richard Kaner, a professor of chemistry, biochemistry and materials science – that separates oils and other suspended solids from water that is co-produced during the oil and gas extraction process. Hoek gained experience with water treatment in the oil and gas industry during the summer of 2010, when he served as a consultant during the oil spill cleanup in the Gulf of Mexico.

Hoek said his business endeavors have been an education for him, and that they benefit his students.

“What I learned from NanoH2O is the mechanics of the process of starting up a company, the legal issues and the market forces that you need to consider,” Hoek said. “I believe that entrepreneurial forays by faculty actually make us better teachers. We can mentor from real experience, and students respect and listen to that.”

“Dr. Haimes has been a leader in the application of systems analysis methods to infrastructure problems for over 40 years.”

William W-G Yeh
The UCLA-CEE Partners Program

Pairing faculty, staff and students with civil engineering firms, contractors utilities, government agencies and foundations, the UCLA-CEE Partners program offers a wide range of benefits to members.

- Special opportunities for student recruitment at career fairs and info sessions
- Opportunities for collaborative research with CEE students and faculty
- Certificate programs for employees to receive on-campus training
- Complimentary invitations to CEE and UCLA Engineering events and seminars
- Recognition on the CEE Department website and in CEE Department publications
- Much more

For more information:
Visit: www.cee.ucla.edu/partners
Email: eeskes@seas.ucla.edu

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