Dear Prospective Graduate Student:

Thank you for your interest in the Oregon State University School of Civil and Construction Engineering (CCE). The school is a dedicated group of students, faculty, and staff who are solving some of the world’s toughest challenges and creating a better future.

These are exciting times at Oregon State. In the CCE geomatics group, researchers employ state-of-the-art drones, laser scanning, and 3D visualization in their work. In the structural engineering group, researchers are making advances in wood construction with cross-laminated timber, an alternative, renewable building material that features considerable cost-savings compared to traditional materials. Researchers in the school are also developing new methods to strengthen aging infrastructure, prepare for potential hazards, and are identifying ways to enhance workplace safety. These are just a few examples of the exceptional work at CCE – a visit to our campus will provide many more.

Within CCE, there are nine focus areas of teaching and research. The school works in a collaborative approach – with other academic units, local and federal government, and industry – to positively influence the environment and to tackle local and global challenges. This cooperative approach has led to a major effort in developing a new resilience network. A specific example is the Cascadia Lifelines Program, a partnership between OSU, regional governments, and private industry aimed at improving critical infrastructure performance and transportation modeling during an anticipated major earthquake along the Cascadia Subduction Zone.

CCE offers a wide range of courses and research opportunities that allow students to choose from a variety of focus areas in which to specialize. Students are also encouraged to pursue an interdisciplinary approach to their research and many programs permit students to take up to 15 hours of courses in a minor area of their choice.

While at CCE, graduate students conduct their research in first-rate facilities. The O.H. Hinsdale Wave Research Laboratory is one of the world’s largest and most technically advanced laboratories for coastal research. The Driving and Bicycling Simulator is one of only a few where a driver and bicyclist can interact in the same virtual environment. Additionally, the school is in the process of launching a revolutionary new 40,000-square-foot research facility.

CCE students have the opportunity to connect with alumni and industry partners, many of whom visit campus frequently and are eager to support students. This network helps CCE graduates remain on the cutting edge of research and connects them to their future profession.

Thank you again for your interest and I hope you enjoy your visit to OSU. I look forward to your contributions and the impact you will have on Oregon – and beyond.

Go Beavs!

Sincerely,

Jason Weiss
Head of the School of Civil and Construction Engineering
The Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering
Director of the Kiewit Center for Infrastructure and Transportation Research
SCOPE AND OBJECTIVES
The graduate program in Coastal and Ocean Engineering at Oregon State University emphasizes the interdisciplinary nature of research and education on emerging themes related to natural coastal hazards such as tsunamis and hurricanes, as well as the effects of climate change including sea level rise and increasing storminess. Additional themes include marine renewable energy, coastal ecology, and sustainable communities. Our program seeks to enable students to pursue research topics that cross the traditional boundaries of coastal engineering, and to prepare students for leadership positions in academia, private, and public sectors.

SAMPLING OF COASTAL AND OCEAN ENGINEERING COURSES
CE 411/511 - Ocean Engineering
CE 415/515 - Coastal Infrastructure
CE 417/517 - Hydraulic Engineering Design
CE 631 - Ocean Eng. Wave Mech. II
CE 634 - Long Wave Mechanics
CE 635 - Applied Modeling of Nearshore Processes
CE 639 - Ocean Structure Dynamics
CE 642 - Random Waves
CE 643 - Coastal Engineering
CE 645 - Wave Forces
CE 647 - Ocean and Coastal Engineering Measurements
WHY OREGON STATE UNIVERSITY?
I was first drawn to OSU because of its reputation of having an outstanding engineering program. I ultimately decided to attend because of how welcomed I felt by the coastal and ocean engineering students and faculty. The department’s environment is open and friendly, and very conducive to learning.

HOW DID YOU BECOME INTERESTED IN COASTAL AND OCEAN ENGINEERING?
When I finished my undergraduate degree, I worked as an engineer for a tidal power company in the Bay of Fundy. After about a year in industry, I knew I wanted to learn more about fundamental ocean mechanics principles, and explore ocean renewable energy from a research setting. Coastal and Ocean Engineering combines the best of two worlds: the excitement and wonder of the coast with a practical engineering approach.

DESCRIBE YOUR CURRENT RESEARCH.
I work with Associate Professor Merrick Haller in remotely sensing ocean waves using an X-Band Marine Radar. We are researching the possibility of wave-by-wave forecasting using an assimilation of radar images. This will benefit the development of ocean wave energy converters, which need knowledge of the incoming waves for optimal control.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
My plans after graduation are still in the air – and that is exciting. I feel well-equipped to acquire a job in coastal engineering, and I know the faculty are always willing to help.

WHAT DO YOU LIKE ABOUT OREGON STATE UNIVERSITY?
I like that OSU is dedicated to having state-of-the-art facilities, such as the O.H. Hindsdale Wave Lab. I’ve also found that the computing resources are phenomenal. There are always plenty of computers available to students, and we have free access to a wide range of software programs. The size of the university also means there are countless extracurricular opportunities; since enrolling, I’ve been able to play with OSU’s Concert Band, practice with the Triathlon Club, and learn how to rock climb.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
Corvallis is the most comfortable town I’ve ever lived in. I’d never considered myself a small town person, but I love the safety and ease of living here, especially because it enables me to focus on my studies without too much hustle and bustle. And, within a one or two hour drive, I can surf, ski, hike, paddle, bike, or find concerts in Eugene or Portland – you name it!

BEST IN THE FIELD
Faculty within the OSU coastal and ocean group are widely considered to be leaders in the field, routinely receiving research funding from agencies like the National Science Foundation, the Office of Naval Research, Oregon Sea Grant, and the U.S. Army Corps of Engineers.

OSU is also home to the O.H. Hindsdale Wave Research Laboratory (WRL), one of the largest and technically advanced laboratories for coastal research in the world.

EMPLOYABLE GRADUATES
Graduates of the coastal and ocean engineering program at OSU are making an immediate and positive impact on our built environment. Alumni of the program have gone on to serve as leaders in government, industry, and academia. Current employers include leading research institutions, engineering consultants, the U.S. Army Corps of Engineers, U.S. Navy Civil Engineering Corps, and the U.S. Coast Guard.

NAME YOUR ADVENTURE
Corvallis, Ore., is ideally located in the central Willamette Valley. Whether you want to head for the mountains, play at the ocean, or travel to Portland for a night in the big city, it is all within a 90-minute drive from the OSU campus.
Construction Engineering Management (CEM) is the application of scientific and technical knowledge to the processes used to construct infrastructure projects. Graduate studies in CEM at Oregon State University emphasize construction engineering and management concepts and techniques and their broader application to the Architecture/Engineering/Construction (A/E/C) industry.

The instructional program is highly interdisciplinary and aims at developing strong abilities to conduct construction engineering and management work involving basic concepts and principles, technical analysis, planning, design, and management, and the development of knowledge that positively impacts the A/E/C industry. The program provides students with skills in planning, designing, and implementing construction processes and systems. The course offerings provide a broad awareness of construction concepts and an understanding of scientific and technical knowledge to address construction problems.


**S C O P E A N D O B J E C T I V E S**

Construction Engineering Management (CEM) is the application of scientific and technical knowledge to the processes used to construct infrastructure projects. Graduate studies in CEM at Oregon State University emphasize construction engineering and management concepts and techniques and their broader application to the Architecture/Engineering/Construction (A/E/C) industry.

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- CE 507 - CCE Grad Seminar
- CE 520 - Engineering Planning
- CE 524 - Contracts and Specifications
- CE 527 - Temporary Construction Structures
- CCE 520 - Advanced Concrete Construction
- CCE 525 - Construction Site Systems Engineering
- CCE 526 - Design for Safety in CCE
- CCE 529 - Lean Construction
- CEM 541 - Heavy Civil Construction Management
- CEM 543 - Project Management for Construction
- CEM 550 - Contemporary Topics
- CEM 551 - Project Controls
- CEM 552 - Risk Management
- CEM 553 - Construction Business Management
WHY OREGON STATE UNIVERSITY?
In 2009, I visited Corvallis and the OSU campus and found this to be the right place for me. It’s a great city and an excellent educational institution. During my visit, I met Dr. John Gambatese and decided that he should be my future adviser. After the initial visit, I returned to Iraq for three years before joining the OSU community in 2012.

HOW DID YOU BECOME INTERESTED IN CONSTRUCTION ENGINEERING MANAGEMENT?
I started working in the field in 2003 and began teaching project management and engineering economy at a university in Iraq. Both opportunities contributed to my interest in construction management.

DESCRIBE YOUR CURRENT RESEARCH.
In general, I am working on construction safety and focusing in particular on accident causations. I am developing a new model for accident causations that consider the indirect roots of safety issues rather than only direct causes.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
In fact, my future life and career are already planned and I am going back to teach at a university in Iraq. Additionally, I have plans to establish a safety training agency to promote occupational health and safety.

HOW HAS OREGON STATE HELPED YOU PREPARE FOR YOUR FUTURE CAREER?
There are many things to name! For example, I have taken different classes that are beneficial for a career in higher education. I was also exposed to the practical side of construction processes by observing different projects on the OSU campus.

WHAT HAVE YOU LIKED ABOUT OREGON STATE UNIVERSITY AND CORVALLIS?
Everything is great about Corvallis and OSU. It is a quiet and peaceful city with friendly people who always smile and are ready to help. Corvallis’ location is central and travel by car makes it easy to visit many different and interesting nearby places. The coast, Portland, Seattle, and California are just a few examples from a long list of places to explore. OSU also provides a variety of opportunities for students and allows for flexible programs of study. There is also a broad range of research and recreational facilities at OSU. Additionally, I have enjoyed the faculty immensely. Now that my time at OSU is drawing to a close, I am sorry that I will not have the opportunity to take classes with the newly hired professors in the construction program. Lastly, with the help of wonderful friends, I worked toward perfecting my pool game.

DO YOU HAVE ADVICE FOR INCOMING GRADUATE STUDENTS?
Start thinking about your dissertation subject from day one! Do not leave the writing to a later time. Keep summarizing and paraphrasing what you read. The thesis is just a wall that is built brick after brick and if you do not prepare a good plan to build it, the final product will not be good. Since the research community is heading toward new techniques, try to learn some beforehand. Also, choose your classes depending on your research and future needs and not only depending on how many credits you need. If you think about getting a minor, then you are in the right place at OSU. You can do it smoothly and you just need to consult with your adviser and the great staff at the School of Civil and Construction Engineering.

SAFETY FIRST
OSU is widely considered as one of the leaders in construction safety research. Working collaboratively with funding agencies, industry, and academic partners like the Oregon Department of Transportation, faculty within the school regularly investigate, contribute, and improve how the A/E/C industry approaches construction safety within the built environment.

ALWAYS A PLACE TO EXPLORE
The Pacific Northwest is a well-known destination for travelers around the world, particularly for those with an interest in the outdoors. Oregon is home to 13 national forests, 21 national wildlife refuges, 361 state parks, as well as national scenic areas and national grasslands. Factor in Corvallis’ ideal location in the central Willamette Valley, an outdoor adventure is always just a few steps away.
GRADUATE STUDIES IN ENGINEERING EDUCATION

SCOPE AND OBJECTIVES
Graduate study in Civil and Construction Engineering Education at Oregon State University integrates fundamentals of civil and construction engineering with the learning sciences. Students will develop expertise in contemporary theories and practices on how people learn in academic and professional settings. Our program seeks to enable students to be leaders in academia and industry as experts in both civil and construction engineering technical content and how people learn, adapt, develop, and succeed in these fields.

SAMPLING OF ENGINEERING EDUCATION COURSES
At least two thirds of civil and construction engineering education graduate student’s coursework will consist of civil and construction engineering courses. A sample of the learning science and educational research courses available for selection are listed below.

- CE 590 – Engineering Teaching and Learning
- SED 621 – Survey of Research on Learning
- SED 623 – Curriculum Theory
- SED 611 – Survey of Research on Teaching
- SED 612 – Quantitative Research Design and Critical Analysis
- SED 613 – Learning Theory
- ChE 599 – Engineering Education Foundations
WHY OREGON STATE UNIVERSITY?
I decided to study Civil Engineering at Oregon State University because OSU is known for having one of the best engineering programs in the country. Also, I enjoy Oregon a lot and after living in a few different states, I’ve decided that I want to stay in the state after I complete my studies.

HOW DID YOU BECOME INTERESTED IN ENGINEERING EDUCATION?
I started working on my research related to engineering education in the summer of 2015. Engineering education is a new field for me and I like learning new concepts. It is interesting and quite different than other civil engineering sub-disciplines.

DESCRIBE YOUR CURRENT RESEARCH.
My research is about teaching evaluation practices. Teaching evaluation is a critical aspect of higher education and the purpose of my research is to identify current practices used to evaluate and assess teaching in engineering programs across the country. My research will describe evaluation practices within three types of institutions which include teaching-focused universities, research intensive universities, and community colleges. This study is important to have a better understanding and assessment of the current state of practice employed in engineering departments in a variety of institutions.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
My plans change all the time. However, I do hope to find an engineering job that I love and enjoy. I would also take a break and spend time with my loved ones and go on a vacation. School has been fun yet it’s hard work.

WHAT DO YOU ENJOY ABOUT OREGON STATE UNIVERSITY?
There is so much to enjoy about OSU. Other than the football games and cultural events, I love that I got to work with and know amazing people, especially in my research group.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
I have always liked living in a small community such as Corvallis. The people in this community are always friendly. Also, there are so many places to go to that are close to home such as the coast and Portland. I also enjoy the weather here, especially compared to where I used to live in Alaska where it’s winter most of the year.
GRADUATE STUDIES IN GEOMATICS ENGINEERING

SCOPE AND OBJECTIVES
Graduate study in Geomatics Engineering at Oregon State University integrates fundamental spatial data and boundary law theoretical knowledge with practical applications. Students gain exposure to the latest in geomatics technologies and boundary theory. The M.S. and M.Eng. Programs prepare students for careers in civil engineering geomatics design, consulting, development, regulation, or construction. Additionally, the M.S. program provides the background for students more interested in teaching, research, or specialization to pursue the Ph.D. degree.

Students pursuing graduate school who have a BS degree in Civil Engineering (ABET\EAC) or Construction Engineering Management (ACCE) who take 16 credit hours of approved civil engineering geomatics courses are eligible to sit for the Fundamentals of Surveying Examination in addition to the Fundamentals of Engineering Examination in the State of Oregon.

Interdisciplinary studies are encouraged for geomatics students. Up to 15 hours can be spent to focus in a minor area (within CCE; e.g. geotechnical, transportation, ocean, etc.) and outside (e.g. geosciences, computer science, etc.) or other, if desired, and related to research or future goals.

SAMPLING OF GEOMATICS ENGINEERING COURSES
CE 5XX - 3D laser scanning and imaging (3)
CE 5XX - Least Squares Adjustments (3)
CE 5XX - Kinematic Positioning and Navigation (3)
CE 5XX - GPS Surveying (3)
CESXX - Coastal Remote Sensing (3)
CESXX - GPS/GNSS Theory and Applications (3)
CE 505 - Geodesy (4)
CE 513 - GIS in Water Resources (3)
CE 561 - Photogrammetry (3)
CE 562 - Digital Terrain Modeling (4)
CE 563 - Control Surveying (4)
CE 565 - Oregon Land Survey Law (3)
CE 569 - Property Surveys (3)
STUDENT SPOTLIGHT - MATT O’BANION

After graduating from UC Davis with a degree in geosciences, Matt O’Banion spent five years working in private industry as a geotechnical engineer. However, with a strong interest in lidar and its applications to the profession, he came to OSU to learn new ways to apply the technology and improve the built environment.

WHY OREGON STATE UNIVERSITY?
The main draw was OSU Associate Professor Michael Olsen and the research he was doing. I checked out a variety of schools online and was drawn to his research and his interdisciplinary approach. To me, OSU’s decision to have somebody like him on the faculty is indicative of the importance OSU places on collaboration. After visiting the school and community, I knew it was right place for me.

HOW DID YOU BECOME INTERESTED IN GEOMATICS ENGINEERING?
At UC Davis, I was introduced to lidar applications in geosciences through one of the labs. I got a peak at some of the stuff they were producing and it was really interesting. After graduation, the company I worked for relied on helicopter lidar for one project and I really enjoyed it. I started teaching myself how to deal with the data and build some 3D models. At that point, it spurred me to learn more about the technology, which is how I ended up at OSU.

DESCRIBE YOUR CURRENT RESEARCH.
My background is in geology and I worked in geotechnical engineering for about five years following my undergraduate program. I wanted to apply lidar and 3D-data acquisition to geotechnical work, so that is what drew me to OSU. Since coming here, I am really focused on LiDAR acquisition, processing, and analysis, and learning more about the computer science side of the process.

Right now, I am formulating my thesis; but, the main project I am working on is a virtual reality, immersive system that we have configured in our lab. We are trying to put people in the point cloud instead of looking at it on a computer screen. We are trying to create an environment that allows people to go in and do things as if they were there themselves. It’s a new technology and approach; so, it is exciting to build and see what it can do.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
It is an interesting industry right now. I’m still learning about all the options and all of my interests. I would be interested in finding a company that is progressive in how they approach this new technology. There are a lot of new hardware tools that can benefit civil engineering and other industries as well; so, I would like to work for a company that takes an innovative approach to finding solutions.

WHAT HAVE YOU LIKED ABOUT OSU AND CORVALLIS?
I really have liked the college-town feel. It’s a great community to work and live. The facilities and equipment at the school are really impressive. Having a terrestrial lidar scanner is not something to underestimate. To have that at our disposal for projects is amazing. The courses are also terrific. You can really apply what you learn and they do a great job of introducing you to new technical and theoretical content and relating it to industry. It is evident to me you can do this grad program and go get a really good job.
SCOPES AND OBJECTIVES

Graduate study in Geotechnical Engineering at Oregon State University emphasizes the integration of the science of soil mechanics and the art of foundation and earth structure engineering. Theory is prominent, but it is constantly and critically re-evaluated with respect to its limitations and applicability to the practice of effective geotechnical engineering. Logic, science, and algorithmic thinking are emphasized to equip students with a robust toolbox of problem solving techniques applicable to a wide range of engineering problems, in geotechnical engineering and the broader sciences. The M.S. and M.Eng. programs prepare students for careers in consulting, design, development, regulation, or construction. Additionally, the M.S. program provides the necessary background to pursue the Ph.D. degree for students more interested in research, teaching, or specialization. The Ph.D. program is research intensive and prepares students to be leaders in consulting firms, government agencies, and academic institutions.

The most interesting problems to be faced by the next generation of civil engineers will not be narrowly defined within a single subdiscipline. To that end, the OSU Geotechnical Engineering program is broadly multidisciplinary in terms of research and education. Geotechnical faculty regularly collaborate with others in the School of Civil and Construction Engineering - structural, water resources, geomatics, and coastal engineers - and also with faculty from a broad range of other disciplines, including mathematics, physics, materials science, biomedical engineering, oceanography, seismology, forestry, and agricultural economics. This multidisciplinary collaborative spirit extends into the classroom, where professors share their diverse experiences and students are encouraged to take classes from across the school, college, and university.

SAMPLING OF GEOTECHNICAL ENGINEERING COURSES (CREDIT HOURS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CE 514</td>
<td>Groundwater Hydraulics</td>
<td>(3)</td>
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<tr>
<td>CE 518</td>
<td>Groundwater Modeling</td>
<td>(4)</td>
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<td>CE 570</td>
<td>Environmental Geotechnics</td>
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<td>CE 571</td>
<td>Advanced Foundation Engineering</td>
<td>(4)</td>
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<tr>
<td>CE 572</td>
<td>Advanced Laboratory Testing of Soils</td>
<td>(4)</td>
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<td>CE 575</td>
<td>Earth Retention and Support</td>
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<td>CE 576</td>
<td>Ground Improvement</td>
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<td>CE 577</td>
<td>Static and Dynamic Soil Behavior</td>
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<td>CE 578</td>
<td>Geotechnical Earthquake Engineering</td>
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<td>CE 579</td>
<td>Slope Stability and Embankment Design</td>
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<td>CE 57x</td>
<td>Unsaturated Soil Mechanics</td>
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<td>CE 57x</td>
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<tr>
<td>CE 588</td>
<td>Probability-Based Analysis and Design</td>
<td>(4)</td>
</tr>
<tr>
<td>CE 592</td>
<td>Pavement Structures</td>
<td>(3)</td>
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</table>
WHY OREGON STATE UNIVERSITY?
I was drawn to OSU by the research that was occurring at the university. Prior to applying for a Ph.D. position, I saw an interview with Dean Scott Ashford at the O.H. Hinsdale Wave Lab where he discussed the potential Cascadia Subduction Zone earthquake and subsequent tsunami and liquefaction phenomenon. I was already interested in earthquake engineering and this exciting interview inspired me to apply to the school. When I visited CCE, I met graduate students who spoke highly of their advisers and were enthusiastic about their research. The combination of the students, faculty, and exceptional facilities – such as the wave lab – influenced my decision to attend OSU.

HOW DID YOU BECOME INTERESTED IN GEOTECHNICAL ENGINEERING?
I became interested in geotechnical engineering during an undergraduate workshop in Switzerland where I had a hands-on tunneling experience. I remember vividly how we visited a tunnel under construction (it was dark, dusty, and loud – I loved it). Immediately, I was fascinated by the excitement and adventure of the field. After completing my general bachelors and masters in structural engineering in Germany, I worked as an underground structures and tunnel engineer in Switzerland.

DESCRIBE YOUR CURRENT RESEARCH.
My research combines the field of tunneling with the field of earthquakes. Together with an industry partner, I am looking into the challenging aspect of crossing an active fault zone with a tunnel. Specifically, I’m examining the issues that arise during and after seismic activity, and identifying the most appropriate ecological and economical solutions so the existing tunnel maintains its life goal of 100 years or more.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
Most likely, I will stay in the region, where earthquakes are unavoidable and there is a lot of work to be done to create a more resilient community and built environment. Additionally, I will try to obtain my Professional Engineering License and will most likely continue research in an academic setting.

WHAT DO YOU ENJOY ABOUT OREGON STATE UNIVERSITY?
OSU faculty have been open and supportive. They’re awesome. During classes, I enjoy the discussions between students and faculty. I’ve grown fond of this interactive learning! The classroom culture combined with the awe-inspiring campus – especially in spring – is just the right place for me.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
I like downtown Corvallis with its small stores, coffee shops, nightlife, theater, and cinemas. Coming from Europe, the small town has its charm. During the summer, I especially enjoy the Saturday Farmer’s Market and floating in the Willamette River. I also like that Portland, Seattle, the Cascades, and the ocean are nearby. A 45-minute ride to the coast on a sunny afternoon is priceless!
OREGON STATE UNIVERSITY - GRADUATE STUDIES
INFRASTRUCTURE MATERIALS

GRADUATE STUDIES IN INFRASTRUCTURE MATERIALS

SCOPE AND OBJECTIVES
Graduate study in the Infrastructure Materials focus area at Oregon State University emphasizes fundamental multi-scale understanding of material properties using experimental and computational methods. Our investigations span time scales from early-age properties to long-term performance. Principles of green construction and materials selection, rehabilitation, assessment and repair of infrastructure are also emphasized. Coursework provides fundamental theory as well as application to real-world engineering challenges.

Research opportunities abound and are supported in the suite of world-class Infrastructure Materials Laboratories. The M.S. and M.Eng. Programs prepare students for careers in consulting, design, development, regulation, or construction in the private and public sectors. Additionally, the M.S. program provides the background for students wishing to further their career in academic or industrial research, teaching, or further specialization to pursue the Ph.D. degree.

SAMPLING OF INFRASTRUCTURE MATERIAL COURSES (CREDIT HOURS)
CCE 520 – Experimental Methods in Cement Chemistry (4)
CCE 520 - Corrosion and Its Control (4)
CCE 520 - Condition Assessment, Repair, Rehabilitation of RC Structures (4)
CCE 520 - ST/Pavement Materials
CCE 520 – Selected Topics in Infrastructure Materials
CCE 520 - ST/Advanced Concrete Construction
CCE 520 - ST/Asphalt and Asphalt Mixture
CCE 520 - ST/Pavement Design and Sustainability
CCE 522 - Green Building Materials (3)
CCE 523 - Concrete Durability (3)
CE 532 – Finite Element Analysis (4)
MATS 555 - Experimental Techniques in Material Science (4)
MATS 570 – Structure Property Relationships (4)
MATS 584 - Advanced Fracture and Fatigue of Materials (4)
CE 592 - Pavement Structures
CE 596 - Pavement Evaluation and Management
WSE 571 - Renewable Materials in Building Construction (3)
ST 515 – Design and Analysis of Planned Experiments (3)
Monica Morales, a first-generation college student who completed her graduate degree with a focus on infrastructure materials recently discussed what led her to OSU, her research, and why she loved living in the Pacific Northwest.

**AS A HIGH SCHOOL STUDENT, HOW DID YOU CHOOSE TO ATTEND OSU?**
I’m originally from Reno and I wanted to find something new. I have always loved the Pacific Northwest so applied to several schools in the area. I made a visit to Oregon State – it was my first visit – and I fell in love with it. OSU seemed more welcoming than other schools I visited, which was important as a first-generation college student.

**HOW DID YOU CHOOSE THE FIELD OF CIVIL ENGINEERING?**
Growing up, I did not know what I wanted to do. My mother pointed out I was really good at math and science and that I should look into engineering. I looked at various career paths where math and science were core strengths, everything from being a doctor to becoming a fashion designer. Looking at all of the different fields, civil engineering seemed the most impactful to me. Buildings, bridges, roads, and water are all essentials to society and it felt like I would have the chance to really serve the public and I still feel that way. It is great.

**YOU REMAINED AT OSU TO PURSUE A GRADUATE DEGREE, WHAT WAS YOUR FOCUS AREA?**
My graduate focus area was in infrastructure materials with a minor in water resources engineering. During my time as an undergrad, I got involved with Concrete Canoe and was a co-captain when we went to nationals. I also did undergrad research with Dr. Jason Ideker because he works in sustainable materials. Through internship programs, I really enjoyed my work with water and environmental issues. Through the two paths I became interested in issues such as corrosion and durability of materials, especially as they relate to water resources issues. I felt I could combine the two and completed my studies with Dr. Burkan Isgor.

**TELL US ABOUT YOUR RECENT RESEARCH PROJECT.**
We assessed the durability of reinforced concrete. Inspectors use surface resistivity measurements on reinforced structures and we used the same probe to see how cracks, corrosion, and delimitation affect those readings. By doing this, we can give better consulting advice to accurately assess the lifespan of a reinforced structures. It is a tool that will really help the inspectors. It was a great study because it is going to be put to use in real world scenarios.

**WHAT ARE YOUR FUTURE PLANS?**
I plan to go into consulting in the area of water resources engineering. I feel like the corrosion and materials education at OSU has given me an edge.

**WHAT DID YOU ENJOY ABOUT CORVALLIS AND THE PACIFIC NORTHWEST?**
It was amazing. It is so clean, green, and you can ride your bike everywhere. Corvallis is a tremendous community where you can feel safe and still have plenty to do. I love it here.
GRADUATE STUDIES IN STRUCTURAL ENGINEERING

SCOPE AND OBJECTIVES
Graduate study in the Structural Engineering focus area at Oregon State University emphasizes an understanding of how to create safe, long-lasting, and economical structures. Oregon State researchers are developing modeling tools and investigating the behavior of a number of structural systems: reinforced concrete bridges, cross-laminated timber buildings, steel buildings, and wood residential structures. Special attention in examining the effects of a large magnitude, Cascadia Subduction Zone earthquake and the resulting ground shaking and tsunami on Pacific Northwest structures is a growing focus. A number of structural engineering students are engaged in a dual-major program with the Department of Wood Science and Engineering, where the structural applications of renewable materials are emphasized.

SAMPLING OF STRUCTURAL ENGINEERING COURSES
CCE 522 – Green Building Materials
CE 527 – Design of Temporary Structures
CE 532 – Finite Element Analysis
CE 534 – Structural Dynamics
CE 537 – Nonlinear Structural Analysis
CE 580 – Advanced Seismic Design
CE 581 – Reinforced Concrete I
CE 582 – Masonry Design
CE 583 – Bridge Design
CE 584 – Wood Design
CE 585 – Matrix Structural Analysis
CE 589 – Seismic Design
WHY OREGON STATE UNIVERSITY?
The College of Engineering at OSU has a great reputation. Many of my mentors and teachers recommended it to me during my high school exchange program in Corvallis. Also, OSU offered many options in regard to programs of study, student organizations, and research areas.

HOW DID YOU BECOME INTERESTED IN STRUCTURAL ENGINEERING?
My aptitude for math and science and my desire to make the world a better place lead me to engineering. Professional engineering practice is crucial for the well-being of a community and we can see that clearly from the role of our built environment and water, wastewater, energy, and transportation infrastructure into our daily lives. I chose the Structural Engineering program because it provided me with the opportunity to do the type of work I enjoyed the most and apply my skills to help solve problems in many different areas.

DESCRIBE YOUR CURRENT RESEARCH.
My research is in the area of Life Cycle Assessment of structural building materials. More specifically, I am evaluating and comparing the environmental impact of using wood in place of steel, concrete, or masonry in commercial construction in Oregon. During my research, I have had the opportunity to perform structural design, computer modeling, and help answer a question of great interest to many of us here in the Northwest.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
After I graduate, I plan to work for an international structural consulting firm, enhance my engineering skills, and attain my PE and SE licensure. I want to promote sustainable development and seek innovative and collaborative approaches to problem solving, both at work and outside of my job.

WHAT DO YOU LIKE ABOUT OREGON STATE UNIVERSITY?
There are so many things I like about OSU, including the opportunity to make friends from all over the world, learn from and work with outstanding faculty, participate in abroad experiences and internships, and feel part of a great community. Besides, the campus is so beautiful during each season, come and see it for yourself!

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
Corvallis is a beautiful and quiet college town, however, there are always things going on, you just have to ask. One of my favorite things about Corvallis is its outdoor culture, due to proximity of location to the coast and the mountains. This is a great place to enjoy and explore the beauty of the nature. The Corvallis community is extremely friendly, inspiring, and supportive, so you will feel at home here.
TRANSPORTATION ENGINEERING

SCOPE AND OBJECTIVES
Transportation serves society’s basic needs for personal travel and transfer of goods. Transportation engineering applies scientific and technical knowledge to provide economical and efficient transportation service that meets societal needs while maintaining compatibility with environmental, energy and safety goals.

Oregon State University offers a graduate concentration in transportation engineering leading to the degrees of Master of Engineering, Master of Science and Doctor of Philosophy. The program promotes collaborative research and provides a state-of-the-art curriculum to help prepare students to be leaders in the industry, providing skills in planning, design, operation, construction, and maintenance of transportation systems and facilities. To meet student goals, the department utilizes interactive classrooms to prioritize student learning outcomes, implements learning environments where students engage in authentic engineering problems, and leverages hands-on learning from field data collection, to software applications, to analytical methods.

The course offerings provide both a broad awareness of transportation concepts and a depth of scientific and technical knowledge to address transportation problems. Required classes for graduate work include traffic operations, highway design, transportation planning, and statistics. Additional classes on railroads, airports, traffic signals, traffic simulation, highway safety, demand modeling, and pavements are offered as electives through the school. Students are also encouraged to take elective course throughout other departments and colleges on campus to aid in their professional and research endeavors, including: human factors, transportation economics, geographic information systems, and applied psychology.

SAMPLING OF TRANSPORTATION COURSES
CE 552 – Isolated Signalized Intersections
CE 554 – Driving Simulation
CE 590 - Transportation Safety Analysis I
CE 590 - Network Flow Analysis and Optimization
CE 591 - Transportation Systems Analysis and Planning
CE 592 - Pavement Structures
CE 593 - Railroad Engineering
CE 593 - Traffic Flow Analysis and Control
CE 595 - Traffic Operations and Design
CE 597 - Public Transportation
CE 598 - Airport Planning and Design
CE 599 - Intelligent Transportation Systems
After completing her undergraduate studies at OSU, Kamilah Buker joined the transportation engineering master’s program. Following graduation, Kamilah plans to join a consulting firm with a focus in transportation.

**WHY DID YOU CHOOSE TO ATTEND OREGON STATE UNIVERSITY?**
I chose OSU because I was looking to stay within the state and knew I wanted to study engineering. When I visited the university, I was sold. The campus was beautiful and the people were very friendly. I could see myself studying there for the next four years.

**HOW DID YOU BECOME INTERESTED IN TRANSPORTATION ENGINEERING?**
I became interested in transportation engineering after my summer internship at David Evans and Associates, Inc. I was able to help in a wide range of transportation projects and learned about the diversity of the field. I chose a career path in Transportation Engineering because I have always had a passion for problem solving. With the progression of technology and a rapidly increasing domestic population, traffic issues will continue to develop and efficient and economical solutions will need to be discovered.

**DESCRIBE YOUR CURRENT RESEARCH.**
My current topic of research is the improved safety and efficiency of Protected/Permitted Right Turns in Oregon. The goal of my project is to develop an understanding of the safety and operational implications of using the Flashing Yellow Arrow (FYA) to indicate a permitted right-turn, and to provide general guidance as to when Protected/Permitted Right-Turn (PPRT) phasing should be used to maximize the safety of non-motorized road users and the overall efficiency of the Oregon Department of Transportation’s signalized intersections.

**WHAT ARE YOUR PLANS FOLLOWING GRADUATION?**
After graduation I hope to move to Portland and work at an engineering firm with a focus in transportation engineering.

**WHAT DO YOU LIKE ABOUT CORVALLIS AND OREGON?**
I enjoy the small town atmosphere and the easy access to nature. I enjoy running and hiking and like having the ability to easily access places such as Avery Park and Baldhill Natural Area.

**ANY ADVICE FOR INCOMING GRADUATE STUDENTS?**
Work hard, stay positive, and try to learn as much as you can. This is an amazing opportunity and it is up to you to take advantage of it!
SCOPE AND OBJECTIVES
The graduate program in Water Resources Engineering at Oregon State University emphasizes interdisciplinary research and education on emerging themes related to environmental extreme events and hazards (e.g., floods, explosive air-water geyser flows, etc.), groundwater hydrology, watershed hydrology, green urban water infrastructure, hydroinformatics, water resources systems analysis, and adaptation to climate change. The instructional program aims at developing strong abilities to conduct engineering work involving basic concepts and principles, technical analysis, planning, design and management. Our program seeks to enable students to pursue research topics that cross the traditional boundaries of water resources engineering, and to prepare students for leadership positions in academia, private, and public sectors.

PROGRAM OF STUDY
Students develop their study programs from a variety of courses in civil engineering and other departments and programs across OSU. Civil Engineering departmental courses typically form the major field of study. Supporting course work from other departments and programs is encouraged because of the breadth of the water resources engineering field and to take advantage of strong supporting programs in many natural resources departments on campus.

The major field usually consists of a core of course work in surface and groundwater hydrology, hydraulic engineering, water quality, stormwater management, river engineering, and water resources systems analysis. This is complemented by studies in a selected field such as environmental engineering, geotechnical engineering, bioresource engineering, forest hydrology, stream ecology, geomorphology and geology, and resource economics, as well as many other possibilities. Students consult with their advisor to develop study programs that fit their academic and professional goals.

SAMPLING OF WATER RESOURCES COURSES
CE 512 - Hydrology
CE 513 - GIS in Water Resources
CE 514 - Groundwater Hydraulics
CE 517 - Hydraulic Engineering Design
CE 525/CE 540 - Stochastic Hydrology
CE 540 - Selected Topics: Stormwater Management and Modeling
CE 540 - Selected Topics: Optimization in Water Resources Engineering
CE 544 - Open Channel Flow
CE 547 - Water Resources Engineering I: Principles of Fluid Mechanics
WHY OREGON STATE UNIVERSITY?
While applying for U.S. graduate programs, I was looking for a high-ranked university with expert faculty members that work in my fields of interest. Oregon State University was a perfect match for me with its well-equipped laboratories, beautiful surroundings, and friendly people.

HOW DID YOU BECOME INTERESTED IN WATER RESOURCES ENGINEERING?
Water is one the most valuable and scarce natural resources. During my undergraduate studies, I learned a lot about the importance of water and that experience inspired my interest in the field.

DESCRIBE YOUR CURRENT RESEARCH.
My research has focused on data assimilation in water quality models of water bodies such as rivers and lakes. I am also collaborating with the Klamath River fish health team to investigate the possible solutions that could decrease the risk of mortality in salmonids.

WHAT ARE YOUR PLANS FOLLOWING GRADUATION?
After graduating, I would like to find a job related to my field to make a connection between what I have learned in school and what is required in industry.

WHAT DO YOU LIKE ABOUT OREGON STATE UNIVERSITY?
Oregon State University is one of the high-ranked universities in my field and it also features world-class facilities and well-equipped laboratories. Additionally, it is located in the Pacific Northwest, which is a great place to live and work.

WHAT ABOUT CORVALLIS AND THE SURROUNDING COMMUNITY?
Corvallis is a small and quiet city which makes it perfect for students. When you need to focus, the atmosphere is conducive to studying and when you have free time, you can enjoy the beautiful natural surroundings. There are lot of trails and hiking areas to spend the weekend and prepare for a productive week at school.
RESEARCH AND FACILITIES

COASTAL AND OCEAN ENGINEERING

The Coastal & Ocean Engineering program at OSU is a leading center for research and education in coastal engineering and nearshore science, in which world-class faculty and staff specialize in physical/numerical modeling of coastal dynamics and field observations. A short list of focus areas includes: nearshore hydrodynamics, tsunami propagation and storm surge, remote sensing of nearshore waves and currents, turbulent sediment suspension and transport, and wave-structure interaction.

The Coastal & Ocean Engineering Program is also the home of the O.H. Hinsdale Wave Research Laboratory (HWRL) and the Edwards Nonlinear Wave Lab. The HWRL is one of the largest and technically most advanced laboratories for coastal research in the world and contains the Directional Wave Basin and the Large Wave Flume. Through a National Science Foundation (NSF) award in 2015, two main resources at the HWRL become part of a distributed, national program – the Natural Hazards Engineering Research Infrastructure – that provides the natural hazards engineering community with access to various research infrastructure, as well as educational and community outreach activities.

In addition to coastal hazards research, the facility is used for general testing of coastal infrastructure, for nearshore processes research, and for testing marine renewable energy devices.

DIRECTIONAL WAVE BASIN

The Directional Wave Basin is designed as a shared-use facility to understand the fundamental nature of tsunami and hurricane wave/surge hazards, including inundation to improve our numerical tools for coastal hazard mitigation, overland flow through the built and natural environment, fluid-soil-structure loading and response, debris impact, erosion and scour, natural and nature-based mitigation, and harbor resonance.

LARGE WAVE FLUME

The Large Wave Flume is the largest of its kind in North America. Because of its size and ability to operate in high Reynolds regimes, the flume is ideally suited for: scaled shallow water hurricane and storm wave conditions, long wave and tsunami generation, active wave absorption for large reflected waves, and minimizing tank seiching for long duration studies.

EDWARDS NONLINEAR WAVE LAB

With the aid of the NSF support, a new water tank was completed in 2006. This apparatus was designed and constructed specifically for precision experiments for water-wave-mechanics with optical instruments. This tank enables us to measure wave and velocity fields from every angle using various optical techniques for flow visualization, as well as laser-Doppler anemometer (LDA) and particle-imagery velocimetry (PIV) systems.

CONSTRUCTION ENGINEERING

Construction Engineering research at OSU focuses on alternative contracting techniques, risk management, construction safety, sustainability, accelerated and durable construction, construction materials, and enterprise management. Over the past several years, CEM faculty have led or participated in research sponsored by the Construction Industry Institute (CII), National Cooperative Highway Research Program, the Oregon Department of Transportation (ODOT), The Center for Construction Research and Training, ELECTRI International, Pacific NW Transportation Consortium, and the National Institute for Occupational Safety and Health.

CONSTRUCTION SAFETY RESEARCH LABS

Construction safety research is conducted both in on-campus laboratories and on construction sites. For work zone safety research, the OSU Driving Simulator Lab provides an opportunity to model construction work zones within an interactive environment. The simulator allows for studying the interaction between passing traffic (driver behavior) and construction operations to examine worker exposures to safety hazards and safety performance of traffic control measures.

For research on construction safety related to temporary and permanent structures, the Civil and Construction Engineering (CCE) structures lab, and the Wood Science and Engineering (WSE) structures lab, are available for use. Given the complex, large scale, and unique nature of construction projects, safety research is also conducted on construction sites and in architecture/engineering/construction offices located throughout Oregon and the Pacific Northwest to monitor and
RESEARCH AND FACILITIES

record work practices, worksite conditions, and worker behavior in actual, real-world settings.

CONSTRUCTION ENGINEERING RESEARCH LABS

Multiple labs across the OSU campus provide the opportunity to conduct high-level and full-scale construction engineering research related to structures and materials. Civil and Construction Engineering and Wood Science and Engineering have multiple structures and materials labs available for use. For construction issues related to structures, the CCE and WSE structures labs provide the ability to model and test structures constructed of concrete, steel, wood, and other materials. Laboratories for materials testing include the Concrete Performance Lab, Kiewit Materials Performance Lab, and Green Building Materials Lab. Each lab is equipped with state-of-the-art technologies capable of conducting a wide range of research on the performance and impacts of materials used for construction. Additionally, construction sites located throughout Oregon and the Pacific Northwest are utilized to study construction operations, temporary structures, and construction materials in use.

FIELD DATA COLLECTION RESOURCES

In addition to the equipment available in the labs, our research capabilities are supported by a wide variety of equipment for field research. The equipment is selected to allow for the collection and analysis of multiple types of data associated with construction research.

GEOMATICS

The Civil Engineering Geomatics program at OSU is a leading center for research and education in geomatics applied to civil engineering and other fields. Our students also collaborate with researchers in a wide variety of disciplines. A short list of focus areas includes: 3D laser scanning/lidar, Geographic Information Systems, Geospatial Hazard Analysis, GPS/GNSS positioning, Atmospheric monitoring with GNSS, height modernization with GNSS, Cadastral Surveys, UAVs, UAV remote sensing, geospatial data management, and geomatics computation and programming.

GEOMATICS LABORATORY

OSU has access to a large amount of state-of-the-art equipment and software thanks to a memorandum of understanding between OSU, Leica Geosystems, and David Evans and Associates, Inc. This provides students with access to high-end, modern, Leica Geosystems Survey equipment. Students will be trained on the latest equipment available in industry practice. Leica has provided powerful software packages (Leica Geo-Office and Cyclone), which are used in OSU’s courses for survey and scan data processing. Maptek I-Site also provides licenses to OSU for I-Site Studio. QCoherent LP360 is also available for lidar data processing and analysis.

3D LASER SCANNING

OSU owns and operates Two Leica ScanStation2 laser scanners, a Riegl VZ-400 terrestrial laser scanner, and a NextEngine Micron resolution structured light system. In addition, OSU partners with Leica Geosystems and David Evans and Associates to use state-of-the-art Leica scanners, as needed. OSU has access to a variety of software to work with 3D point clouds including Leica Cyclone, Maptek I-Site, the Terrasolid suite, and LP260. We also write a substantial amount of custom code for efficient and reliable point cloud processing.

SURVEY EQUIPMENT

Thanks to Leica and DEA, OSU has ten Leica Viva Series TS 15 P Robotic Total Stations, five of which have smart station capabilities with GNSS. In addition, there are several Leica DNA-03 and DNA-10 digital levels along with both sectioned fiberglass and single piece invar rods allowing for 1st, 2nd, or 3rd order work to be carried out.

UNMANNED AIRCRAFT SYSTEMS

The geomatics group has two DJI multicopters for performing remote sensing. These systems are capable of flying up to 18 minutes on a single battery, provide first-person view video, and can be programmed to follow photogrammetric flight paths. OSU also has Agisoft Photoscan for generating 3D models and point clouds from the images. Recently, OSU purchased the Sensefly eXom, a professional UAS designed for inspecting structures.

GPS/GNSS

OSU has 5 Leica GNSS receivers, a Trimble R8 GNSS receiver with a wifi hotspot to connect to Oregon’s RTK network as well as equipment to setup a GPS base station for differential and RTK GPS.
RESEARCH AND FACILITIES

COMPUTING LABS
In addition to the computing labs offered by CCE, OSU Civil Engineering Geomatics has two dedicated computing labs. A graduate lab contains 10 high power graphics workstations (Quad Core processors, 24+ GB RAM, 1GB+ dedicated video RAM) with dual monitors for processing lidar data. These computers are equipped with the latest in lidar, GIS, and other geomatics software. The Photogrammetry Lab contains several computers with ERDAS Imagine software.

GEOTECHNICAL
Geotechnical engineers help design structures that are either composed of soil or rock or are in contact with it - that is, they engineer the interface between the natural and built environments. Their research provides insights into the performance of structures in contact with earth, such as bearing failures, settlement damage, and failures due to emergent processes such as landslides and liquefaction. Scott Ashford, Matt Evans (Group Coordinator), Ben Leshchinsky (Forest Engineering, CE–FE liason), Ben Mason, and Armin Stuedlein form the core of the geotechnical engineering research program in the School of Civil and Construction Engineering at OSU. Affiliated faculty include Dan Gillins (geomatics), Michael Olsen (geomatics), Marv Pyles (Forest Engineering, Emeritus), Lee Schroeder (Emeritus), and Ted Vinson (Emeritus).

GEOTECHNICAL FIELD RESEARCH SITE
The Geotechnical Engineering Field Research Site at OSU provides researchers, engineering practitioners, and contractors with a well-characterized site for research and product testing. The site was established in 1997 with the first round of extensive geotechnical and geophysical investigations.

The site is flat, open, and free of overhead obstructions. The working area available for field testing or fabrication of models is approximately 180 m × 120 m. The site has easy access for testing and construction equipment, adjacent city water supply, and nearby power and wireless network access. The soils are predominantly overconsolidated fine-grained materials with a depth to bedrock of about 30 m; groundwater fluctuates between 1.5 m and 2.5 m below ground surface.

Representative examples of full-scale testing at the test site include the evaluation of:
- construction and quality assurance testing of drilled shaft foundations;
- static and cyclic response of helical anchors;
- effect of mechanically-stabilized earth (MSE) wall reinforcement strip spacing on pullout resistance;
- torsional load transfer of drilled shafts;
- effect of seasonal groundwater fluctuation on performance of spread footings resting on aggregate piers;
- effect of proximity of piles to slopes on lateral capacity; and
- geophysical methods for measuring the shear wave velocity of soils.

GEOTECHNICAL RESEARCH LAB
The Geotechnical Research and Teaching Laboratories were completely renovated in 2013. These labs are well-equipped for the complete characterization of the engineering properties of soils, including index properties, compaction characteristics, hydraulic conductivity, compressibility, rate of consolidation, quasi-static shear strength, cyclic shear strength, and thermal properties (conductivity and specific heat capacity).

Element-scale testing capabilities range from fundamental to sophisticated for both teaching and research. Of note is the infrastructure for characterization of liquefiable soils, including cyclic triaxial and cyclic simple shear devices. Large load frames and triaxial cells facilitate the measurement of stress-strain-strength properties of crushed rock and coarse aggregate. Studies of complex soil behavior are facilitated by advanced electronics and innovative laboratory techniques, including optical microscopy, propagation of elastic waves, acoustic emissions monitoring, and thermal properties characterization.

GEOTECHNICAL COMPUTING RESOURCES
The Geotechnical Engineering Group maintains a large library of software for simulation of a variety of complex multiphysics problems with geotechnical applications. There is active research in discrete element method modeling (PFC, LAMMPS), finite element method modeling (ABAQUS, ANSYS, Comsol, Plaxis, GeoStudio), finite difference modeling (FLAC), and limit analysis (LimitState:GEO, Optum:G2) in the group. The software is installed on modern multicore workstations, high throughput servers, and computer clusters for access by students and faculty either on their desktops or through the cloud.
RESEARCH AND FACILITIES

INFRASTRUCTURE MATERIALS
Infrastructure Materials Research in CCE at OSU focuses on cement-based materials, alternative cements, asphalt, metals and innovative materials and systems. Our research spans multiple scales from nano to macro and and time horizons from early-age to long-term properties. We combine fundamental scientific and engineering investigations with computational modeling and predictive tools to provide real-world solutions. We are funded by a wide range of sources including NSF, DOD, Departments of Transportation, University Transportation Centers and widespread Industry collaborations. Research is done across a suite of unmatched facilities in North America. We operate in four different laboratories including the Concrete and Asphalt Performance Lab, the Kiewit Materials Performance Lab, the O.H. Hinsdale Wave Research Laboratory and the Green Building Materials Lab. We also have an extensive outdoor exposure site for bench-marking accelerated laboratory investigations to real environmental exposure. Work is accomplished by a team of Professors and Post-Doctoral Researchers as well as outstanding graduate and undergraduate Research Assistants; Professors Bell, Coleri, Ideker, Isgor, Trejo, and Weiss lead these efforts.

CONCRETE PERFORMANCE LAB
Research at the Concrete Performance Lab focuses on the prediction of long-term durability and characterization of early-age volume change of cement-based materials. Our multi-scale approach results in translational research that combines fundamental scientific understanding with the improvement and development of test methods and specifications that enhance concrete performance. We are recognized experts in concrete durability, namely alkali-silica reaction, early-age properties of calcium aluminate cements and prediction of cracking risk in high performance concrete. Concrete is the most used building material in the world. While new materials may show promise, they are often made from natural resources that are not found in quantities to compete or even replace concrete. It is for this reason that concrete is the most advantageous for further development. Enhancements to concrete achieve superior performance may be a central path forward to ensure both long-term durability and sustainability. These avenues are central to our research at OSU.

KIEWIT MATERIALS PERFORMANCE LAB
Kiewit Materials Performance Lab was designed to carry out sensitive bench-scale experiments to characterize various types of materials and investigate their deterioration mechanisms. Materials of interest involve cement/concrete, metals, alloys, polymers, coatings, asphalt and wood. The laboratory is equipped with grounded bench-top space, two high-performance fume hoods, an environmental test chamber, cyclic corrosion test chamber, isometric calorimeter, thermogravimetric analyzer (TGA), and electrical and electrochemical testing equipment (including potentiostats/galvanostats and FRAs for AC Impedance analysis). Among many other capabilities, the laboratory is also fully equipped to conduct sensitive electrochemical investigations to study corrosion phenomena in metals/alloys and to study performance and durability of coatings and composite materials.

GREEN BUILDING MATERIALS LAB
The Oregon BEST Green Building Materials Laboratory includes research activities from the Schools of Chemical, Biological and Environmental Engineering and Civil and Construction Engineering and the Department of Wood Science and Engineering. Equipment housed in this Oregon BEST Signature Laboratory will allow OSU researchers to characterize, develop and test high performance sustainable materials for a wide variety of applications including buildings and transportation infrastructure. It also enables OSU to continue to recruit top faculty, researchers and students to the OSU campus.

PAVEMENT STRUCTURES AND MATERIALS LABORATORY
The Pavement Structures and Materials Laboratory is equipped to conduct modeling and testing in several areas of pavement technology including asphalt binder and mixture characterization, aggregate characterization, asphalt mix and structural design, concrete materials testing, and concrete pavement design. Research conducted at the Pavement Structures and Materials Lab encourages the use of more sustainable pavement materials, such as permeable pavements, rubber asphalt, warm-mix asphalt technologies, recycled asphalt pavements, recycled concrete, and alternative cement binders. The lab is also equipped with computational modeling tools to investigate possible applications of pavement design strategies that can have a considerable impact on fuel consumption, vehicle maintenance costs, greenhouse gas (GHG) emissions, and lifecycle costs. The laboratory enables researchers to develop research programs to study pavement materials at both the applied and basic research levels.

STRUCTURAL
While all members of the OSU structural engineering faculty have an interest in structural analysis and seismic related issues, Dr. Higgins and Dr. Miller specialize in design and experimental studies; Dr. Liu explores resilient steel structures, with a focus on seismic and disproportionate collapse resistance; Dr. Borello, Dr. Scott, and Dr. Yim emphasize structural mechanics, dynamics, computer application and numerical modeling, and Dr. Barbosa specializes in laboratory testing, numerical modeling, and probabilistic methods applied to engineering problems (risk and reliability).

In recent years, structural engineering research projects have been supported by the National Science Foundation, Oregon Department of Transportation, United States Department of Agriculture, and the Office of Naval Research. Collaborative work has been developed with researchers at Lehigh University, Cornell University, the Transportation Ministry (Japan), and the Tokyo Institute of Technology, Tufts University, and several international universities in in Europe and in Asia. Researchers also belong to the Consortium of Universities for Research in Earthquake Engineering (CUREE) and Pacific Earthquake Engineering Research (PEER) Center.

STRUCTURAL ENGINEERING LABORATORY
Many structural engineering research projects take advantage of OSU’s large scale structural strong floor and 160 ft-high strong wall. Housed in the O.H. Hinsdale Wave Research
RESEARCH AND FACILITIES

Laboratory, this facility has the second largest structural testing floor on the Western United States and allows researchers to simulate forces up to one million pounds and frames up to two stories high. The floor is steel-reinforced concrete five feet thick, with massive bolts and anchors to which materials can be attached and their strength tested. Additionally, the laboratory has a large scale environmental chamber and a 4’x4’ shake table.

The facility has recently been used for studies of bridge cracking that have been undertaken on behalf of the Oregon Department of Transportation. Of the states 1800 bridges constructed in the 1950’s, 500 have been identified as cracked. Replacement and repair costs could cost several billion dollars. In addition, the facility has been used on a couple of projects related to high strength steel material for use in bridges and buildings, testing of real-scale bridge gusset plates, as well as building structural components, such as URM walls. OSU researchers are developing modeling tools and data banks to forecast how the built infrastructure will perform over time, develop ways to assess structural reliability, and identify cost-effect repair options for our aging infrastructure.

WOOD STRUCTURES LAB

Most of the experimental research related to wood structures is conducted at the Gene D. Knudson Wood Engineering Laboratory in the Department of Wood Science and Engineering in Richardson Hall on the OSU campus. A 3000 sf. high-bay facility with 12-ft high L-shaped reaction wall and 60x40 foot reaction floor to accommodate dynamic testing of large wood components and structural systems. It is equipped with servo-hydraulic test systems as well as specialized fixtures.

Many graduate students have been and are involved in dual-major Master of Science or Doctor of Philosophy degree programs in CE and WSE, and complete one thesis or dissertation on wood structures or wood mechanics as their joint research effort.

TRANSPORTATION

Transportation research at OSU can be divided into two broad interest areas: 1) traditional transportation engineering (e.g., transportation planning, operations, design, and safety) and, 2) pavement design and pavement materials.

Significant funding comes from various state, regional, and federal sources such as the Federal Railroad Administration, National Cooperative Highway Research Program, National Institute of Disability and Rehabilitation Research, National Science Foundation, Oregon Department of Transportation, US Department of Education, the Pacific Northwest Transportation Consortium (PacTrans), Sea Grant, and the Transit Cooperative Research Program as well as private industry.

DRIVING AND BICYCLING RESEARCH LAB

Researchers affiliated with the laboratory are concerned with studying transportation operations and safety issues from a multi-modal perspective. Due to the complexity of transportation problems, research conducted in the laboratory is interdisciplinary and requires expertise in transportation engineering, human factors, cognitive psychology, medicine, and statistics, among others. The laboratory is an experimental tool which can help uncover the explanatory mechanisms of transportation user behavior, leading to improvements in the safety and operations of transportation systems.

The high fidelity driving and bicycling simulators allow researchers to evaluate many more scenarios than would be practically possible in the field or on an instrumented test track while at the same time controlling for extraneous variables. As a result, drivers and bicyclists can be exposed to risky scenarios that would be either very difficult or impossible to evaluate in the real world or on a test track. The bicycling simulator is one of only a few in the world, and can operate simultaneously with a driving simulator in the same virtual environment. Mobile eye tracking is used in conjunction with both simulators and in the field to evaluate the visual attention of transportation users.
RESEARCH AND FACILITIES

CENTER FOR ACCESSIBLE TRANSPORTATION

At OSU, the Center for Accessible Transportation (CAT) conducts research and development projects that concentrate on accessibility and cost-effective improvements in transportation technologies, with the goal of making transportation safer and more dignified for all. The projects focus on accessible air, rail, and urban transportation. The CAT laboratory is fully accessible and is used for research, development, and testing of new technologies and equipment. The laboratory is equipped with a range of wheeled mobility devices, and is also the permanent home of the test dummy family. CAT has 50th and 90th percentile male test dummies, and a 50th percentile female that are used for the bio-mechanics research.

COGNITION AND LEARNING LABORATORY

This lab is used for the identification and categorization of student misconceptions and knowledge of practicing engineers and for the development, implementation and testing of educational interventions to both overcome misconceptions and prepare students for the engineering workforce. The lab is outfitted with state of the art video and audio recording and teaching and learning equipment to facilitate engineering education research.

WATER RESOURCES

The faculty in the Water Resources Engineering program is actively involved in a wide range of research activities dealing with problems in groundwater hydrology and contamination, river hydraulics, multi-phase computational hydraulics, real-time control of multi-objective reservoir systems, watershed hydrology, storm water management, coastal flooding, water resources systems analysis, and hydroinformatics. These research areas are led by Professors Jack Istok, Arturo Leon, and Meghna Babbar-Sebens. Their work is augmented by emeritus faculty members Wayne Huber, Peter Klingeman, and David Bella, and instructor Tracy Arras.

CCE WRE faculty have traditionally been heavily allied with other water-oriented faculty around the OSU campus, including engineers and scientists in Biological and Ecological Engineering, Forest Engineering, Geosciences, Crop and Soil Science, and elsewhere. The university is widely recognized for its integrative and interdisciplinary activities in water resources.

GREEN STORMWATER INFRASTRUCTURE RESEARCH FACILITY

OSU-Benton County Green Stormwater Infrastructure Research (OGSIR) Facility is a three-celled stormwater research facility for field-scale experiments and testing on green stormwater infrastructure. The cells provide the ability to test various stormwater treatment technologies and treatment of various stormwater contaminants. These cells are also instrumented with multiple sensors to enable better data collection and modeling.

Pollutants captured at this facility include tractor leaks, fuel tank spills, raw asphalt, road fill sediment, parking lot sediments and chemicals, and road paint spills. In addition to stormwater treatment, this facility supports long term research on stormwater quality to inform current and future projects for treating stormwater using ‘low impact development’ technology.

The lab is a partnership project to enhance water quality, provide long-term research and support stormwater and water quality education and outreach. Partners in the project include Benton County, OSU, Oregon BEST, State of Oregon Water Resources Department, and the Pacific Northwest Transportation Consortium.

GROUNDWATER RESEARCH LAB

The Groundwater Research Laboratory, located in the Oak Creek Building on the OSU campus, is involved in groundwater testing and research with an emphasis on clean-up of sites contaminated by radionuclides and chlorinated solvents. The lab, which features sophisticated equipment to detect a wide variety of contaminants in groundwater, concentrates on in situ aquifer characterization technologies, including the novel single-well “push-pull” method.

MULTIPURPOSE RIVER HYDRAULICS RESEARCH FACILITY

The MRHRF features a recirculating system with the ability to test two simultaneous and independent experiments with flows of up to 35 cubic feet per second. The facility is ideal for the construction and testing of river and low head pressurized hydraulic structures, and it can also be used for a wide range of research projects, including flood control, reservoir sedimentation, density currents, erosion and scour, aquatic habitat, stream restoration, fish passage and dam removal. The $600,000 Facility consists of a re-circulating system with a 20-m x 8-m concrete slab (platform for experiments), two independent head tanks, a sediment catchment, a clean water sump, pumps, and impulsion and return pipe lines. Partners for the lab include the United States Environmental Protection Agency, Oregon BEST, OSU, and Northwest Research Associates.

INSTITUTE FOR WATER AND WATERSHEDS

At OSU, over 125 faculty teach and conduct research in areas related to fresh water supply and quality. These faculty members are spread among six colleges and represents many different academic disciplines – including engineering, ecology, geosciences, social sciences, economics and arts. OSU also hosts a vibrant Water Resource Graduate Program where students can earn specialized degrees in water resources engineering, science, and policy and management.

The IWW is the hub for this diverse water research community. It seeks to solve complex water issues by facilitating integrative water research.
SCOTT ASHFORD
Dean, College of Engineering
Kearney Professor of Engineering
Geotechnical

RESEARCH: Dr. Ashford’s research focus is enhancing public safety and reducing potential economic loss worldwide from earthquake and coastal hazards. He performs trans-disciplinary work in earthquake and coastal engineering, focusing on full-scale modeling of soil-foundation-structure interaction, seismic site response, coastal erosion, and slope stability. His latest efforts are targeted at improving the resilience of the lifeline systems in the Pacific Northwest to better withstand earthquakes and tsunamis created by the Cascadia Subduction Zone.

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INGRID AROCHO
Assistant Professor
Construction

RESEARCH: Dr. Arocho’s research interests include construction equipment fleet management, pollution production during construction activities, and construction methods improvement to reduce environmental impact. Her previous research included the estimation and forecasting of pollution emissions from construction equipment fleets.

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TRACY ARRAS
Senior Lecturer/Lower Division Coordinator
Geomatics

RESEARCH: Dr. Arras’ technical interests are principally in the area of geographical information systems and the integration of geomatic technologies (remote sensing, image processing, and GPS) for engineering applications. Technical interests also include the development of new innovative and effective pedagogic approaches (e.g., use of information technology and connectivity) to engage freshman and sophomore students. Her teaching interests include introductory GIS, GIS and Water Resources, and introductory freshman and sophomore courses that utilize information technology.

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MEGHNA BABBAR-SEBENS
Assistant Professor
Water Resources
Eric H.I. and Janice Hoffman Faculty Scholar

RESEARCH: Dr. Babbar- Sebens’ research interests lie in the area of Hydroinformatics, which employs simulation modeling, and information and communication technologies to help solve problems in hydraulics, hydrology and environmental engineering for better management of water-based systems. Examples of specific research applications include: Monitoring and modeling of urban green infrastructure for stormwater management; Web-based participatory design of conservation practices in watersheds; Advanced optimization algorithms and approaches for adaptation planning in presence of uncertainty, multiple objectives, and multiple stakeholders.; Data assimilation in water quality models using multiple sensors (e.g., in-situ instruments, satellites, and unmanned aerial systems (UASs), etc.)

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**ANDRE BARBOSA**  
Assistant Professor  
Kearney Faculty Scholar  
Structural  

**RESEARCH:** Dr. Barbosa’s research focuses on the development of experimental testing programs and numerical tools and techniques geared towards improving structural performance and resilience of the built environment to multiple hazards. Studied within the group are earthquakes, fire, and tsunami hazards. Structural materials which are addressed are reinforced concrete, timber, and steel.  

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**AMBER BERGER**  
Instructor  
Structural  

**TEACHING:** A recent CCE master’s of science graduate, Ms. Berger has extensive experience in private industry as a structural engineer, designing commercial and nuclear-related structures. This fall, Berger teaches Orange LEAP, an innovative three-semester program aimed at assisting engineering students with the types of math pertinent to their degrees.  

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**SHANE BROWN**  
Associate Head of Undergraduate Affairs  
Associate Professor  
Transportation, Engineering Education  

**RESEARCH:** Dr. Brown’s research interests are in cognition and learning, with a particular emphasis on conceptual change and situated cognition. His conceptual change research examines why concepts are harder to learn than others and how to develop environments that facilitate understanding. His situated cognition research explores differences in ways of knowing and how core concepts are used in engineering practice.  

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**ERDEM COLERI**  
Assistant Professor  
Infrastructure Materials, Transportation  
John and Jean Loosley Faculty Fellow  

**RESEARCH:** Dr. Coleri’s research interests are in the areas of sustainable pavement materials and structures, energy efficient pavement design strategies, and infrastructure health monitoring using wireless sensor networks. The major objective of his research group is to develop methods and technologies to construct pavement structures that are more cost effective, socially beneficial, and does less damage to the environment. Main current research projects include: i) modeling and measuring excess vehicle fuel use due to pavement structural response; ii) asphalt pavement layer adhesion through tack coats; iii) adjusting asphalt mixes for increased durability; iv) improving performance of recycled asphalt pavement mixes.  

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**DANIEL COX**  
Professor  
Coastal and Ocean, Engineering Education  

**RESEARCH:** Dr. Cox’s research focuses on coastal engineering, including mitigation of coastal hazards stemming from hurricanes and tsunamis. His research includes wave/surge interaction with the built and natural environment; tsunami evacuation planning; wave impact forces on coastal structures; wave attenuation by vegetation; and coastal sediment transport.  

**CONTACT:** dan.cox@oregonstate.edu
T. MATTHEW EVANS  
Associate Professor  
Geotechnical, Engineering Education  

RESEARCH: Dr. Evans’ research interests include granular mechanics, soil behavior, image analysis, numerical methods, and unsaturated soil mechanics, with applications to renewable energy, multiphysics problems, waste isolation, and sustainable infrastructure. His work is broadly multidisciplinary and has relevance to fields such as materials handling, pharmaceuticals, biomechanical engineering, physics, and geology.  

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JOE FRADELLA  
Senior Instructor  
Hoffman Instructor  
Construction  

RESEARCH: Prior to OSU, Mr. Fradella worked as a construction project manager where projects included historic building restoration and conservation, retaining walls and hardscape work. During his career, he has worked for several engineering and construction firms, primarily focusing on mechanical and electrical systems. His research interests include energy efficiency and construction safety.  

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JOHN GAMBATESE  
Professor  
Oregon Electric Group Faculty Fellow  
Construction  

RESEARCH: Dr. Gambatese’s technical and research interests include: construction safety, constructability, sustainability, design-construction interface, lifecycle properties of constructed facilities, temporary construction structures, and construction engineering. He has conducted research on a variety of topics including: construction safety and health, designing for safety, constructability, innovation in the construction industry, construction automation, alternative contracting methods, and sustainability.  

CONTACT:

KIM GRATZ  
Writing Instructor  

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MERRICK HALLER  
Associate Head of Graduate Affairs  
Professor  
Coastal and Ocean  

RESEARCH: Dr. Haller’s teaching interests include hydraulics, wave mechanics, coastal engineering, and graduate writing. Much of his present research interest is related to the remote sensing of wave transformation processes, especially those processes that lead to hazardous wave conditions, wave breaking, and rip currents. Other efforts are related to interaction between waves and wave energy converters and quantifying the physical effects of wave energy arrays.  

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SALVADOR HERNANDEZ  
Assistant Professor  
Transportation  

RESEARCH: Dr. Hernandez is recognized nationally and internationally in the area of transportation safety and transportation network modeling. His current areas of research interest are: Transportation safety modeling of all modes encompassing crash countermeasures, crash and safety analysis, and statistical modeling; Use of large scale disaggregate data sets for developing strategic, tactical, and operational models and solution methods for problems that arise in the multidisciplinary and interdisciplinary areas of transportation systems. Dr. Hernandez is also interested in behavioral issues in natural disasters such as in earthquakes, travel demand modeling, freight supply & demand modeling, and supply chain logistics modeling.  

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CHRISTOPHER HIGGINS
Professor
Cecil and Sally Drinkward Professor
Structural

RESEARCH: Dr. Higgins’ research expertise is in experimental mechanics and he has extensive experience testing and evaluating structures subjected to a wide range of loading conditions including: seismic, wind, ocean waves, static, fatigue, and dynamic loads. He has conducted research on steel, concrete, composite, hybrid, and polymer structural materials. For his efforts, he has received numerous teaching and research awards throughout his career.

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KATHARINE HUNTER-ZAWORSKI
Associate Professor
Transportation

RESEARCH: Dr. Hunter-Zaworski’s research experience integrates biomechanics and ergonomics with rehabilitation and transportation engineering. She is passionate about developing safe, seamless and dignified accessible transportation systems for people with disabilities. She focuses on rail, aviation and public transportation.

CONTACT: katharine.hunter-zaworski@oregonstate.edu

DAVID HILL
Professor
Coastal and Ocean

RESEARCH: Dr. Hill’s research portfolio includes numerous topics related to nearshore waters. Some recent examples include the linkages between tidal evolution and sea-level rise, the relationships between nearshore oceanographic conditions and biological and ecological processes, the role of coastal freshwater discharge in nearshore processes, and optical measurements of complex flow fields.

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DAVID HURWITZ
Associate Professor
Transportation, Engineering Education

RESEARCH: Dr. Hurwitz conducts research in the areas of transportation operations and safety. In particular Dr. Hurwitz is interested in the consideration of user behavior in the design and innovation of transportation systems. His current research portfolio includes projects dealing with intersection safety (vehicle-bicycle and vehicle-pedestrian crashes), transportation user behavior (driver response to traffic control devices and teenage distracted driving), and transportation engineering education (conceptual assessment of student learning and the dissemination of evidence base instructional practices).

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JASON IDEKER
Associate Professor
Infrastructure Materials

RESEARCH: Dr. Ideker’s research group focuses on the prediction of long-term durability and characterization of early-age volume change of cement-based materials. Our multi-scale approach results in translational research that combines fundamental scientific understanding with the improvement and development of test methods and specifications that enhance concrete performance. We are recognized experts in concrete durability, namely alkali-silica reaction, early-age properties of calcium aluminate cements and characterization and prediction of drying shrinkage in high performance concrete.

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BURKAN ISGOR
Professor
Infrastructure Materials

RESEARCH: The main focus of Dr. Isgor’s research is bridging the gap between nano-scale and macro-scale scientific and engineering problems using applied mathematics, computational materials science (continuum modeling, molecular dynamics and first principles calculations) and advanced analytical, spectroscopic, electrochemical techniques. These techniques allow Dr. Isgor to study interdisciplinary problems in materials science and engineering using both bottom-up (nano-to-macro) and top-down (macro-to-nano) approaches. Dr. Isgor’s research has applications in surface and interface science, corrosion science, electrochemistry, thin films & oxides, durability of materials, transport in porous media, cement & concrete research, inverse modeling and non-destructive testing and evaluation.

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JACK ISTOK
Professor
Water Resources

RESEARCH: Dr. Istok’s research interests include: groundwater hydrology, groundwater quality and remediation, and subsurface fate and transport processes. He designed the large-scale physical aquifer models in the Groundwater Research Laboratory and has developed several novel methods for in situ aquifer characterization. Much of his research focuses on the single-well “push-pull” method, which consists of the controlled injection of a prepared test solution into a single well followed by the extraction of the test solution/aquifer mixture from the same well. The test is being applied at a variety of contaminated sites to study and quantify in situ microbial metabolic processes, sorption and ion exchange reactions, NAPL dissolution and mobilization, and heavy metals solubilization and mobilization.

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JUDY LIU
Professor
Structural, Engineering Education

RESEARCH: In her research, Dr. Liu explores resilient steel buildings, with a focus on seismic and disproportionate collapse resistance. She has interests in behavior and design of structural steel connections and innovative systems for lateral resistance.

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CIVIL AND CONSTRUCTION ENGINEERING FACULTY

PEDRO LOMÓNACO  
Director, O.H. Hinsdale Wave Research Lab  
Coastal and Ocean

RESEARCH: Dr. Lomonaco joined OSU from the Environmental Hydraulics Institute, University of Cantabria, in Spain, where he was the Head of the Hydraulics, Coasts and Offshore Laboratory from 2007-2014. Previously, Dr. Lomonaco was a Research Officer of the National Research Council’s Canadian Hydraulics Centre, in Ottawa, where he designed and executed physical model testing of hydraulic, coastal and ocean structures.

Besides managing and coordinating the activities at the Hinsdale Wave Research Lab, his scientific activity primarily deals with studies of physical and numerical modelling of wave generation and propagation, wave-structure interaction, stability of coastal and submarine structures, behaviour of floating structures, hydrodynamics, and non-linear behaviour of long-waves in shallow waters.

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JOSEPH LOUIS  
Assistant Professor  
Construction

TEACHING: Dr. Louis teaches undergraduate and graduate classes in heavy civil operations and equipment, and analytical tools for construction. His research interest lies at the intersection of simulation, visualization, and automation within the context of construction operations. He draws upon concepts in these areas to provide construction managers with better means of planning, monitoring, and controlling their operations to improve safety, maximize productivities, and minimize equipment idle times. Dr. Louis is passionate about engaging with the broader community and has organized university-level TEDx talks. He was awarded the Zimmerman Award for Innovation and Outreach at Purdue University for his efforts at introducing robotics to middle school students.

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KENNY MARTIN  
Senior Instructor  
Structural

TEACHING: Mr. Martin’s areas of interest include structural design and analysis, design of wood structures, timber mechanics, and the properties & behavior of wood. He teaches undergraduate and graduate courses in engineering mechanics and structural engineering. Courses include ENGR 211 Statics, CE 484/584 Wood Design, and CE 427/527 Temporary Structures.

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BEN MASON  
Assistant Professor  
Geotechnical

RESEARCH: Dr. Mason’s research interests include soil-fluid-structure interaction, residual and momentary soil liquefaction, cyclic mobility of intermediate soils, seismic resiliency on a city-scale, cumulative damage caused by successive hazards, and the seismic response of Willamette Valley silt. He focuses on megathrust earthquakes created by the Cascadia Subduction Zone. Dr. Mason leads the group’s Soil Dynamics laboratory, which contains cyclic triaxial and cyclic simple shear devices.

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THOMAS MILLER  
Associate Professor  
Structural, Engineering Education

RESEARCH: Dr. Miller’s structural engineering and structural mechanics current research interests include earthquake engineering, timber structures and cold-formed steel structures. Recent research projects involve modeling, behavior and seismic response of residential timber structures, effects of perforations in wood I-joists, environmental impacts of various construction materials in structures, directionality of oriented strand board in resisting shear and cross-laminated timber diaphragms.

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JOSEPH LOUIS  
Assistant Professor  
Construction

TEACHING: Dr. Louis teaches undergraduate and graduate classes in heavy civil operations and equipment, and analytical tools for construction. His research interest lies at the intersection of simulation, visualization, and automation within the context of construction operations. He draws upon concepts in these areas to provide construction managers with better means of planning, monitoring, and controlling their operations to improve safety, maximize productivities, and minimize equipment idle times. Dr. Louis is passionate about engaging with the broader community and has organized university-level TEDx talks. He was awarded the Zimmerman Award for Innovation and Outreach at Purdue University for his efforts at introducing robotics to middle school students.

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TUBA OZKAN-HALLER
Professor
Coastal and Ocean

RESEARCH: Dr. Ozkan-Haller’s interests include numerical, field and analytical investigations of water motions in the nearshore zone, defined by water depth at the order of 10-meters or less. Of special interest is the application of numerical models to predict nearshore circulation as well as the modeling of bathymetric change due to this circulation field. Verification of the results is carried out using field and laboratory data.

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CHRIS PARRISH
Associate Professor
Geomatics

RESEARCH: Dr. Parrish’s research focuses on full-waveform LiDAR, topographic-bathymetric LiDAR, hyperspectral imagery, uncertainty modeling, and UAVs for coastal applications. Parrish is the Director of the American Society for Photogrammetry and Remote Sensing (ASPRS) LiDAR Division and associate editor of the journal Marine Geodesy. Prior to joining OSU, he served as lead physical scientist in the Remote Sensing Division of NOAA’s National Geodetic Survey and affiliate professor in the Center for Coastal and Ocean Mapping – Joint Hydrographic Center at University of New Hampshire.

CONTACT: christopher.parrish@oregonstate.edu

MICHAEL OLSEN
Associate Professor
Geomatics

RESEARCH: Dr. Olsen’s current areas of research include the application of terrestrial laser scanning, remote sensing, GIS, geohazard analysis, computer programming, and 3D visualization to various problems within civil engineering. He has developed new, ground-breaking courses in 3D laser scanning and Digital Terrain Modeling. Recent projects he has been involved with include a diverse range of applications including: development of mobile laser scanning guidelines for DOTs, earthquake and tsunami reconnaissance (following recent events in American Samoa, Chile, New Zealand, and Japan), landslides and slope stability analysis, seaciff erosion mapping using LiDAR, liquefaction hazard mapping for Utah, and modeling and studying historical buildings such as the Palazzo Medici and Palazzo Vecchio in Florence, Italy.

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JIHYE PARK
Assistant Professor
Geomatics

RESEARCH: Dr. Park’s research interests include GNSS positioning/navigation and GNSS remote sensing. She focuses on advanced algorithms in order to improve positioning and navigation performance in harsh environments and detecting geophysical events such as natural hazards or artificial explosions by monitoring ionospheric disturbances via GNSS remote sensing.

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CATARINA PESTANA
Instructor
Construction

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ROBERT SCHULTZ
Professor
Geomatics

RESEARCH: Professor Schultz’s interests include surveying and mapping; geodesy; photogrammetry; and boundary law. Subject matter of interest includes all surveying and mapping topics. These include Plane and Geodetic surveying, Photogrammetry and Remote Sensing, Survey Law and Property Surveying, and Highway Location and Design. A professor at OSU since 1962, Schultz has won numerous institutional and national honors for his dedication to students and the field of geomatics.

CONTACT: robert.schultz@oregonstate.edu
CIVIL AND CONSTRUCTION ENGINEERING FACULTY

MICHAEL SCOTT
Associate Professor
Structural

RESEARCH: Dr. Scott’s current research interests include nonlinear structural analysis and dynamics, fluid-structure interactions, structural response sensitivity, and numerical methods. He has experience teaching a number of graduate and undergraduate courses in the areas of structural analysis and dynamics, finite elements, structural simulation and modeling, and computer-aided engineering.

CONTACT: michael.scott@oregonstate.edu

DAVID SILLARS
Associate Professor
Construction

RESEARCH: Dr. Sillars’ technical and research interests include interorganizational relationships in the construction industry; cultural factors in facility delivering; project delivery alternatives; and strategic organizational structuring at the project and enterprise level. For example, one of his recent research projects was evaluating how to use construction contract provisions to encourage timely construction.

CONTACT: david.sillars@oregonstate.edu

ARMIN STUDELEIN
Associate Professor
Geotechnical

RESEARCH: Dr. Stuedlein’s primary research interests center on the behavior, performance, and reliability of geotechnical structures, including deep and shallow foundations, improved ground, and mechanically stabilized earth walls. Dr. Stuedlein recently completed research for the Oregon DOT on the behavior of pipes and culverts installed by ramming, including the development of a comprehensive framework for the evaluation of pipe drivability. His approach combines the evaluation of instrumented geotechnical structures with lab-based soil characterization, numerical modeling, random field theory and geostatistics, and reliability theory to better understand and predict geotechnical performance.

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DAVID TREJO
Professor
Hal Pritchett Chair
Construction, Infrastructure Materials

RESEARCH: Dr. Trejo’s research focuses on the design and development of materials and systems for efficient construction processes and products. His interests focus on the design and development of systems that allow for accelerated and durable construction. Specific research projects have included development of precast overhang systems for safe, rapid, and durable bridge construction, assessment and modeling of segmental, post-tensioned bridges exhibiting strand corrosion, modeling and performance assessment of glass fiber-reinforced polymer (GFRP) concrete reinforcement, and many others.

CONTACT: david.trejo@oregonstate.edu
HARRY YEH
Professor
Coastal and Ocean

RESEARCH: Dr. Yeh’s expertise is in the field of hydrodynamics associated with natural hazards, especially those in a wide variety of tsunami-related problems. He has conducted a wide range of field studies during his career and a majority of his recent research activities are cooperative with applied mathematicians, numerical experts, mitigation strategists, and information technologists and he has extensive collaborative experience with Japanese scientists and engineers.

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HAIZHONG WANG
Assistant Professor
Transportation

RESEARCH: Dr. Wang conducts research in the areas of multi-scale traffic modeling and simulation for transportation operation and system management; stochastic agent-based modeling and simulation for emergency evacuation and disaster response; traffic control and network optimization; and critical lifeline infrastructure interdependency. In addition, his research also includes studying transportation system planning and travel behavior analysis; mobility, safety, energy and environmental analysis of connected and autonomous vehicle; road user charge economic analysis; and bicycle safety analysis.

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SOLOMON YIM
Professor
The Glenn Willis Holcomb Professor in Structural Engineering Coastal and Ocean, Structural

RESEARCH: Dr. Yim’s research focuses on fluid and structural mechanics in the marine environment using high-performance computing based multi-physics, multi-scale and multi-domain systems methods. His recent research topics include hydroelasticity, free-surface flow and fluid contact/impact on deformable marine structures; waves, tsunami, storm surge and earthquake loads modeling and simulation in field and laboratory environments; and mechanics of wave-energy conversion systems.

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JASON WEISS
School Head, Professor
The Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering Director of the Kiewit Center for Infrastructure and Transportation Research Infrastructure Materials

RESEARCH: Dr. Weiss is a leading researcher in the development of more durable and sustainable concrete. At CCE, Weiss directs the Kiewit Center for Infrastructure and Transportation Research and holds the Miles Lowell and Margaret Watt Edwards Distinguished Chair in Engineering. Weiss is internationally recognized for his work in concrete pavement, building and bridges. Specifically, he has focused on minimizing cracking, improving durability, and making concrete more sustainable. As head of CCE, Weiss is leading efforts to improve the resilience of the aging infrastructure.

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