IRA A. FULTON SCHOOLS OF ENGINEERING

Transcending the traditional
Focusing on the student experience and student success
Inspiring future engineers
Pursuing use-inspired research
Attracting top faculty

Dean
Paul C. Johnson

school of sustainable engineering and the built environment

School Director
G. Edward Gibson, Jr.

biofuels
waste conversion to energy
public health-technology-environment interactions
microorganism-human health connections
infrastructure and product lifecycle analysis
earth systems engineering
water purification
resource-climate interactions
indoor air quality
SMART innovations
transportation materials and systems project performance
underground infrastructure

school of computing, informatics, and decision systems engineering

School Director
Ronald G. Askin

personalized learning
educational gaming
energy-efficient data storage and computing
health informatics
haptic interfaces
assisting devices
health care system logistics
information assurance
production logistics
artificial intelligence
transportation
production logistics

school of electrical, computer and energy engineering

School Director
Stephen M. Phillips

photovoltaics
power and energy systems
biosignatures discovery automation
wireless implantable devices
sensors and signal processing
flexible electronics
power grid management and stability
sensors and sensing

school for engineering of matter, transport and energy

School Director
Kyle Squires

personalized learning
ingeosystemskindergarten through 12th grade STEM
electrical energy storage
thermal energy storage and conversion
energy production separations
therapeutics and bioseparations
rehabilitation and robotics
adaptive and intelligent materials
high-performance computing
simulations
atmospheric processes

school of biological and health systems engineering

School Director
Marco Santello

medical diagnostics
rehabilitation
neuroengineering
biomaterials and therapeutics delivery
synthetic and systems biology
healthcare technology
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Greetings! It is an honor to serve as the Director for the School of Sustainable Engineering and the Built Environment (SSEBE). Over the past year, I have had the great privilege to work closely with our faculty, staff, and students in setting the course for our future. Our School is a unique blend of civil and environmental engineering and construction management-focused programs.

This annual report highlights the diversity of activities and accomplishments that make up the collective experiences of our School. As we prepare a new generation of engineers and constructors, our efforts are redefining how we approach the problems that will challenge our future.

It has been a wonderful year for our students, staff, faculty, and alumni. Our students have won a number of prestigious awards and competed very successfully at regional and national competitions. They are matriculating and joining the workforce to help make our world a better place. I am very proud of the work our staff is doing supporting our school, and the recognition they are receiving. Our faculty members continue to win teaching awards, and at the same time, expended over $9.1 million in cutting-edge research last year; a record for our school and an increase of 50 percent over the past five years. Finally, our alumni, young and old, are doing amazing things in their careers.

We are excited about the opportunities in front of us in 2012. In May, eight of our faculty members will be moving into the new ISTB IV building. We are currently planning the new Del E. Webb School of Construction space as the primary academic tenant in a new building set to be built in the Block 12 area near College Avenue. SSEBE administration will also occupy space in this new building that should be open in early 2014.

We are actively recruiting new faculty members. Although we bade farewell to four of our members in 2011, we attracted six outstanding new faculty members. The coming year promises more hiring, as we are pursuing faculty members for as many as eight positions.

We continue to work on improving our curricula and engaging our students in engineering and construction opportunities from the first day on campus. At the same time, we are putting plans forward that promise even more involvement of our industry partners.

The excitement within SSEBE is palpable, and if you are in Tempe, please contact me and come by for a visit.

G. Edward Gibson, Jr., PhD, PE
Professor and Sunstate Chair
Director, School of Sustainable Engineering and the Built Environment


**Gibson named Director of SSEBE**

G. Edward (Edd) Gibson, Jr. was named Director of the School of Sustainable Engineering and the Built Environment in March 2011.

He was appointed as interim director in August 2010. Gibson joined ASU in 2009 as program chair of the Del E. Webb School of Construction. He is professor and Sunstate Chair of Construction Management and Engineering in the School of Sustainable Engineering and the Built Environment.

Gibson has taught at the university level for over 20 years and has developed and taught numerous short courses for industry. He has won several teaching awards, including the Construction Industry Institute’s Instructor of the Year and the National Society of Professional Engineers’ Outstanding Engineering Educator.

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**School of Sustainable Engineering and the Built Environment**

**Research Expenditures**

Dollars in Millions

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<tr>
<th>Fiscal Year</th>
<th>Research Expenditures</th>
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I am excited about the successes we’ve been experiencing in the Civil, Environmental and Sustainable Engineering program in the last year. Our academic programs have been growing with about 600 undergraduate students, 190 graduate students, and 30 teaching and research faculty. Recently, we added to our faculty Drs. Mike Chester and Amy Landis in the sustainable engineering area, Dr. Matt Fraser in the environmental engineering area, and Dr. Zihua Wang in the hydrosystems engineering area.

We are increasing our emphasis in sustainability as an important tool to our graduates who would be using it on a daily basis throughout their career. We recently introduced the sustainable engineering concentration in the undergraduate curriculum and we have been incorporating sustainability in our courses. Our faculty have been increasing their research in sustainability and attracting a large amount of research funds in this area.

We are doing our best to provide hands on experience to our students at different levels. Our freshman students are heavily involved in developing projects in their Intro to Engineering class. We are also considering different alternatives to the senior design class by incorporating the ASCE concrete canoe and steel bridge projects.

We would like to keep in touch with our alumni and get them involved in our academic activities. Our Friends of Civil Engineering (FOCE) members have been working hard to improve the connection between our CESE program and industry. The annual Arizona Pavement/Materials conference organized by CESE with the cooperation of ADOT and the local pavement community has been attracting a large audience and has been receiving great feedback from the local industry.

I want to sincerely thank all of you who stand by our CESE program in so many ways. Your support has been crucial in helping us provide an excellent academic and research environment and enhance the opportunities for our graduates. We welcome new ideas for improving our program performance and creating endowment funds to recognize our outstanding faculty.

The Del E. Webb School of Construction Management Programs continued to consolidate their leading position among the academic programs in the nation. Even though the construction industry was still facing headwinds in 2011, more than 90% of the 89 DEWSC students who earned their bachelor of science in 2011 had appropriate jobs at the time of graduation. Compared to last year, the average starting salary for the DEWSC graduates was higher by about 5%, mainly thanks to a 10% increase at the upper range of the offers. Several graduates received offers above $60K.

We attribute the success of our students to the continuous care of our professors and an increased collaboration between DEWSC and the industry. Throughout their education, each student benefits from a dual mentorship; one from a faculty member and one from an industry representative. We are also encouraging our students to become mentors themselves. By mentoring a junior fellow or a relative attending high school, they increase their emotional maturity and professionalism thus becoming more employable.

In addition to student mentoring and internships, industry members are directly involved in delivering course material to our students. Almost twenty faculty associates (domain experts who are teaching a full class at DEWSC) and about eighty guest speakers worked closely with the full time faculty to ensure that the material learned in classrooms is relevant and well delivered. The industry support of the DEWSC programs was further evident in the direct involvement of industry coaches in preparing our students for the annual Associated Schools of Construction Student Competition in Reno. DEWSC had the best overall performance, taking home trophies in five of the seven problem categories that we competed in.

At the graduate level, the PhD in Construction program has grown to 15 students and our new Doctors in Construction have already been hired by other universities. The PhD program is on its way to provide about 5 new professors per year to enter the construction education and research.

ASU recognizes the value of the DEWSC model of collaboration between students, faculty and industry, and has started to make significant investments in the DEWSC programs. These investments include a significant increase in the number of full-time faculty (hiring is on its way), a new building and support for the new learning laboratories that will be part of the new building.
GRADUATE PROGRAM

Subramaniam Rajan, PhD, PE  
Graduate Program Chair

The Civil, Environmental & Sustainable Engineering graduate degree programs continue to show a healthy growth in spite of the economic conditions. From 2008 AY to 2011 AY, not only did the number of applications for the graduate program increase from 225 to 306 - a 36% increase, but so did the quality measured in terms of GPA, GRE scores and undergraduate/graduate institutions of the applicants. Graduate specialty areas include environmental engineering, geotechnical engineering, hydrosystems engineering, structural engineering, sustainable engineering and transportation engineering. Currently there are 185 graduate students - 52 pursuing the MSE degree, 61 pursuing the MS degree and 72 pursuing the PhD degree. We have also seen a small increase in the number of enrolled under-represented groups and our goal is to make our program more diverse and inclusive. In the same period, the research expenditures have increased from $5.6 million to $9.1 million. This funding increase has enabled us to financially support a large number of our MS and almost all of our PhD students either as research assistants or as teaching assistants. We also graduated the first batch of Accelerated Bachelor’s/Master’s (aka “4+1”) degree students. There are currently 24 students enrolled in this program and the numbers continue to rise showing how much students value the depth of knowledge they get in the graduate program.

The new Master of Science in Engineering (MSE) in Construction Engineering is currently underway with our first group of students enrolled in the program. This graduate degree is a multi-disciplinary program encompassing the civil engineering areas of geotechnical, structural, construction, and transportation with the business knowledge of construction management to prepare students for a career working at the interface of design and construction. Particular emphasis is on developing the necessary skill sets for students interested in a career emphasizing the construction of infrastructure. A construction engineering graduate degree focuses on planning, design, and management for the construction of facilities such as highways, bridges, pipelines, airports, railroads, industrial plants, buildings, dams, and reservoirs. Construction engineers typically engage in the design of temporary structures, cost estimating, planning and scheduling, materials procurement, selection of equipment, and cost control. Applicants must have an undergraduate degree in an engineering discipline to be admitted to the program since we are educating engineers who are eligible to be licensed as professional engineers.

CONSTRUCTION ENGINEERING

Samuel T. Ariaratnam, PhD, PE  
Construction Engineering Program Chair

The newly formed Construction Engineering program is underway and we are excited about the opportunities for students interested in studying the engineering side of the construction industry. Both BSE and MSE degrees are offered. This is the newest program in the U.S. and one of about 15 nationwide. The program focuses on planning, design and management for the construction of infrastructure projects including bridges, airports, pipelines, and other systems that are vital to our nation. Our program curriculum is an integration of Civil Engineering and Construction Management, which provides the best of both worlds in terms of exposure to engineering design and management of construction projects.

We currently have 17 undergraduate students enrolled in Construction Engineering and expect significant growth over the next few years as the program continues to mature. Having a mandatory internship between the Junior and Senior year provides our students with invaluable exposure to the industry, making them desirable to future employers. Additionally, our graduates are well positioned to pursue graduate or advanced professional degree programs such as business or law. We expect our first graduate in fall of 2012.

We look forward to graduating future leaders with the skill set to work towards building and revitalizing our nation's infrastructure systems.

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**School of Sustainable Engineering and the Built Environment**

![Graph showing School of Sustainable Engineering and the Built Environment](image)
new faculty join SSEBE

Mikhail (Mike) Chester, PhD, University of California Berkeley joined the Ira A. Fulton Schools of Engineering School as an assistant professor in the School of Sustainable Engineering and the Built Environment in 2011. He has a joint appointment with the School of Sustainability. Previously, he was a post-doctoral researcher at the University of California, Berkeley, and guest researcher at Lawrence Berkeley National Laboratory.

Chester’s area of expertise is the energy and environmental assessment of large infrastructure systems. His research has focused on transportation systems and cities, evaluating life-cycle and supply chain effects and their associated human and environmental impacts. Chester’s research expands the assessment boundaries of complex systems to understand comprehensive effects of policies and decisions, including infrastructure interdependencies. Ultimately, he is interested in determining the external control and damage costs of these impacts and how internalization of these costs may inform behavioral economics for sustainable policies and decisions.

Matthew Fraser, PhD, Caltech, associate professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability directs several research projects on urban air quality. His research focuses on using organic speciation and receptor modeling to apportion ambient pollutants to their original source. To tackle this complex problem, Fraser’s research group has been involved in field monitoring programs, source characterization studies, emission inventory preparation, and analytical method and instrument development projects.

Fraser received his Bachelors of Science (with University Honors) in Chemical Engineering from Carnegie Mellon University and his Masters and Ph.D. in Environmental Engineering Science from Caltech. Prior to joining ASU, Fraser was on the faculty of Rice University in the Department of Civil and Environmental Engineering.

Keith D. Hjelmstad, PhD, University of California Berkeley is Professor of Mechanics in the School of Sustainable Engineering and the Built Environment. From 2008-11 Hjelmstad served as University Vice President and Dean of the College of Technology and Innovation at Arizona State University. Prior to coming to ASU he spent 25 years on the faculty at the University of Illinois at Urbana-Champaign as professor, associate dean for academic affairs, and a member of the Science Steering Committee of the Center for Simulation of Advanced Rockets.

Hjelmstad is the author of the book Fundamentals of Structural Mechanics (Springer, 2/e) and numerous articles on computational mechanics, earthquake engineering, stability of structures, nondestructive evaluation of large structures, and numerical simulation of complex structures.

Amy Landis, PhD, University of Illinois at Chicago joined the School of Sustainable Engineering and the Built Environment in January 2012 as an associate professor. Most recently a member of the faculty at the University of Pittsburgh, Landis brings a strong research portfolio in the area of sustainable engineering.

Her research interests include: life cycle impact assessment, biofuels, biopolymers and biolubricants. Her teaching interests include supporting underrepresented students and promoting diverse learning styles as well as encouraging active and collaborative learning. She has created service learning opportunities and outreach programs for high school students to encourage interest in the study of sustainable and green engineering.

Narayanan Neithalath, PhD, Purdue University associate professor, joined the School of Sustainable Engineering and the Built Environment in April 2011. Neithalath received his Ph.D. in Civil Engineering (specializing in Concrete Materials) from Purdue University in 2004. His research interests are in the areas of sustainable cementitious materials and systems including high volume cement replacement materials for concrete, development of novel materials for desired performance levels such as pervious concretes, cement-free binder systems and lightweight aggregate concretes, and fundamental aspects of property development.
in conventional and novel cementitious (and cement-less or alkali activated) systems.

Neithalath is also interested in transport properties of porous materials and modeling the structure-property response in a variety of porous media, electrical impedance sensing and sensor systems for infrastructural systems, and non-invasive and non-destructive testing of concrete. He has published over 100 papers in peer reviewed journals and conference proceedings, and has received several awards for his work on novel concrete materials including the NSF CAREER Award, Bengt Friberg Award for Outstanding Paper, and PCA fellowship.

Zhihua Wang, PhD, Princeton University joins the hydrosystems engineering faculty in the School of Sustainable Engineering and the Built Environment as an assistant professor. Previously, Wang was a post-doctoral research associate at Princeton University.

Wang's research interests include multi-scale environmental flows, urban hydrology and meteorology, boundary-layer meteorology, land-atmosphere interaction, atmospheric turbulence, computational mechanics, and heat and mass transfer. Wang is a member of the American Meteorological Society, American Physical Society, American Geophysical Union and International Association for Urban Climate.

Wang received his Ph.D. in environmental engineering and water research and M.A. in materials, mechanics and structures from Princeton University. He earned his M.Eng and B.Eng in civil and environmental engineering from Nanyang Technological University (Singapore).

Thomas Attard, PhD, Arizona State University is an associate research professor in the School of Sustainable Engineering and the Built Environment and lecturer for Academic and Student Affairs. He has taught numerous courses, including Structural Dynamics, Advanced Composites, Inelastic Stress Analysis and Plasticity, Pre-stressed Concrete, Advanced Steel Design, and Statics.

Attard's current research focuses on the seismic retrofit of already-damaged structures using "CarbonFlex," which is a new patent-protected strength-sustainable composite that stabilizes crack growth in damaged substrates using an energy-dissipating mechanism.

Attard has served as chairman of two international conferences on Applied Mechanics and as the director of a large-scale experimental shaking table laboratory. He has published several journal articles and received federal and state research grants from Caltrans, NSF, DoE, and DHS. Attard has also served as coordinator for a Step-to-college high-school outreach program.

Recent Books by Faculty


In the past year, Brad Allenby has had four books published:

Industrial Ecology and Sustainable Engineering (with Tom Graedel, published by Pearson/Prentice-Hall);

The Theory and Practice of Sustainable Engineering (published by Pearson/Prentice-Hall);

The Techno-Human Condition (published by MIT Press); and

The Growing Gap Between Emerging Technologies and Legal/Ethical Oversight (co-edited with Gary Marchant and Joe Herkert, published by Springer.)
Paul Westerhoff is the new associate dean for research in the Ira A. Fulton Schools of Engineering. He is a professor in the School of Sustainable Engineering and the Built Environment, and a senior sustainability scientist at the Global Institute of Sustainability. During his tenure, he has served as chair of Civil, Environmental and Sustainable Engineering and director of the School of Sustainable Engineering and the Built Environment. Westerhoff has gained recognition for his research in the area of emerging contaminants and innovative treatment processes for water. His work has led to prominent research awards from the American Society of Civil Engineers and the Water Environment Federation. He has authored more than 120 peer reviewed journal papers during his career.

Jason Lueke, assistant professor in DEWSC and Brooke Mayer, lecturer in CESE won the 2011 EPICS Gold Faculty Mentor of the Year Award. EPICS (Engineering Projects in Community Service) solve engineering and technology-based problems with not-for-profit community agencies, schools, and government units. This partnership provides many benefits to the students and the community alike. EPICS at ASU began in fall 2009, joining 20 other member universities. EPICS Gold projects are performed without charge by multi-disciplinary student teams comprised of a mix of freshmen through seniors, male and female, etc. Current projects include Bridges to Prosperity Team “Taming Water Cohort” in Guatemala and Bangla-EPICS Water Team “Bangla-EPICS Cohort” in Bangladesh. Each year EPICS gives out two awards for the mentors involved in the program.

Barzin Mobasher’s paper titled “Behaviour of strain-hardening cement-based composites under high strain rates” published on the Advanced Concrete Technology has been selected as one of the best three papers of the year 2011 by the Japan Concrete Institute. This paper is a result of research collaborations with the Technical University of Dresden, Germany and Federal University of Rio de Janeiro, Brazil. Mobasher is a professor in the School of Sustainable Engineering and the Built Environment.

Edward Kavazanjian, professor, is the recipient of the 2011 Karl Terzaghi Award from ASCE. The Karl Terzaghi Award is given to an author of outstanding contributions to knowledge in the fields of soil mechanics, subsurface and earthwork engineering, and subsurface and earthwork construction. This award is one of the most prestigious awards given to a geotechnical engineer. Kavazanjian was cited “For application of the Principles of soil mechanics to the quantification of the Properties of municipal solid waste and the analysis and design of solid waste landfills.”

Paul C. Johnson, dean, Ira A. Fulton Schools of Engineering and professor, School of Sustainable Engineering and the Built Environment, received the Engineers Week 2011 Outstanding Educator of the Year Award.

ASU engineers will develop groundwater treatment technologies for EPA

Paul Westerhoff and Kiril Hristovski will lead a three-year, $500,000 U.S. Environmental Protection Agency project to develop improved technologies for monitoring and removing common groundwater contaminants.

Westerhoff is associate dean for research in the Ira A. Fulton Schools of Engineering and a professor in the School of Sustainable Engineering and the Built Environment. Hristovski is an assistant professor in the Department of Applied Sciences and Mathematics in the College of Technology and Innovation.

The research will focus on developing effective groundwater treatment systems for smaller communities. Testing will be done in areas with extreme climates – Arizona and Alaska – that experience especially high or low temperatures. The results are expected to yield methods and technologies that can be applied to provide improved groundwater treatment systems in locations throughout the country.
SSEBE Faculty receive NSF CAREER Awards

CAREER awards recognize young engineers and scientists who are demonstrating potential to be research and education leaders in their fields.

Soyoung Ahn, assistant professor, has received an NSF CAREER award for her proposal entitled “Dynamic state transition in vehicular traffic and the effects of driver behavior.”

Rosa Krajmalnik-Brown, assistant professor, NSF CAREER award will provide more than $430,000 over five years to help fund research she is conducting in the Center for Environmental Biotechnology on “managing microbial communities.”

Bruce Rittmann, professor in the School of Sustainable Engineering and the Built Environment, has been named a Fellow of the International Water Association (IWA). The IWA is a global network for engineers, scientists and other professionals in the water resources field. Its more than 10,000 members include researchers, utility managers, consultants, industry representatives, health regulators and equipment manufacturers. As a Fellow, Rittmann will have opportunities for collaborations with other leading IWA members.

Rittmann is an ASU Regents’ Professor of Environmental Engineering, a Distinguished Sustainability Scientist with ASU’s Global Institute of Sustainability and director of the Swette Center for Environmental Biotechnology at ASU’s Biodesign Institute.

Rittmann also travelled to Washington, DC to receive the prestigious Environmental Engineering Excellence Award for 2011 from the American Academy of Environmental Engineers for his hydrogen-based membrane biofilm reactor, a technology that is capable of removing nitrate, perchlorate, selenite, chromate and trichloroethene from water.

Cliff Schexnayder, PhD, PE, Dist. MASCE, faculty associate in DEWSC, is the recipient of the ASCE OPAL Award for Education. Established in 1999, the Outstanding Projects and Leaders (OPAL) awards recognize and honor outstanding civil engineering leaders whose lifetime accomplishments and achievements have made significant differences in one of five categories: construction, design, education, government, and management.

Claudia Zapata, assistant professor in SSEBE, will soon begin a three-year term as chair of the national Transportation Research Board’s Committee on Engineering Behavior of Unsaturated Soils. The committee of about 30 members advises the board on matters important to establishing adequate engineering, construction and environmental protection standards for transportation infrastructure.

Zapata has served on the board’s unsaturated soils committee since 2007 and on the Seasonal Climatic Effects on Transportation Infrastructure committee since 2008. She also has played a leading role in various projects for the National Cooperative Highway Research Program.

Top 5% Teacher Awards

Quality and innovative instruction is one of the top priorities of the Ira A. Fulton Schools of Engineering. Faculty are recognized for their excellence in instruction with an annual Teaching Excellence Award and Top 5% Teachers List. Students’ nominations and feedback are reviewed by a faculty committee in determining these honors. Congratulations to the following SSEBE faculty for achieving the Top 5% List for 2010-2011.

Christopher Lawrence, lecturer
Brooke Mayer, lecturer
Paul Westerhoff, professor
Avi Wiezel, associate professor
Professor helps lead international construction group

Samuel Ariaratnam, professor in the Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment since 2001, has taken on a top leadership role for a growing international engineering and construction technology association.

He is beginning a three-year term as chairman of the United Kingdom-based International Society for Trenchless Technology (ISTT), which has more than 5,000 members in 32 countries on six continents. He is only the second North American to serve as the organization’s chairman.

The ISTT promotes the benefits of trenchless technology, a rapidly growing sector of the construction and civil engineering industry. It involves various advanced sustainable construction methods and technologies than can be used to install, repair or replace underground infrastructures with far less disruption to roadways, businesses and homes than conventional underground construction techniques.

Ariaratnam received an award from the Polish Foundation for Trenchless Technology for his contributions as Chairman of the International Society for Trenchless Technology and significant academic achievements in the area of trenchless technology. He was presented with a statuette at a ceremony held in Kielce, Poland.

Ariaratnam was also named as North America's 2012 Trenchless Technology Person-of-the-Year by Trenchless Technology magazine. He was cited for his contributions to advancements in the field of trenchless technology over his career. This is the highest honor bestowed upon an individual in the industry. He is the youngest recipient and only the third academic to receive this distinction.

Ariaratnam’s teaching and research focuses on urban infrastructure management and rehabilitation. His expertise is in trenchless engineering applied to horizontal directional drilling, trenchless pipe replacement and underground utility asset management.

Science Cafés are informal discussions held at the Arizona Science Center that bring together members of the community and university scientists, to discuss how science and technology can change the future. In a typical café, scientists speak for 15-20 minutes on a topic, with the rest of the time for the public to ask questions and present concerns.

April 15, 2011 – “Disasters in Arizona: Are We Prepared?” Edward Kavazanjian, Jr., PhD, PE, GE, Professor, School of Sustainable Engineering and the Built Environment and Tim Lant, Research Director, Decision Theater and Decision Center for a Desert City, Assistant Research Professor, Department of Mathematics and Statistics.

May 20, 2011 – “Germ-Free and Other Myths: Examining Antimicrobial Products” Rolf Halden, PhD, PE, Associate Professor, School of sustainable Engineering and the Built Environment and Ben Hurlbut, Assistant Professor, School of Life Sciences.

Dean’s Lecture Series, Ira A. Fulton Schools of Engineering

January 20, 2011 – Dean's Lecture Series: “What is taking so long? The Empire State Building was completed in 14 months, the Pentagon in 16 months and we made it to the moon in a decade. Why do “simple” buildings, bridges and highways seem to take years?” G. Edward Gibson, Jr., PhD, PE, National Academy of Construction Member, Director, School of Sustainable Engineering and the Built Environment.

March 15, 2012 – Dean’s Lecture Series: “Learning from adversity: Shake, rattle and row” Edward Kavazanjian, Jr., PhD, PE, GE, Professor, School of Sustainable Engineering and the Built Environment. Enhancing Infrastructure Resilience Through Post-Disaster Reconnaissance.
Leaving a legacy

William (Bill) Badger retired from the Ira A. Fulton Schools of Engineering this year, leaving a legacy of progress and innovation in construction education.

In his last lecture, Badger shared leadership wisdom—55 nuggets—with a crowded room of students, faculty, family, alumni, donors, advisors and friends. His book, The DNA of Leadership, is aimed at emerging professionals in the construction industry, but his insights are applicable to all.

Badger has served as professor in the Del E. Webb School of Construction for 25 years, including 17 years as the school’s director. His vision and commitment have helped ASU garner recognition as one of the top construction programs in the nation.

Over the course of his tenure, Badger helped build many of the Del E. Webb School of Construction’s endowments and scholarships, including the $4 million endowment after which the school is now named. Recently, Badger initiated a significant campaign to support the school.

Prior to his work at Arizona State University, Badger had a distinguished 26-year career in the U.S. Army Corps of Engineers, serving in China, Vietnam, Saudi Arabia, Europe and the United States.

A registered Professional Engineer and member of the National Academy of Construction, Badger holds a doctoral degree in soil mechanics from Iowa State University, a master’s in civil engineering from Oklahoma State University and a bachelor’s in mechanical engineering from Auburn University.

Matthew Witczak, a professor in the School of Sustainable Engineering and the Built Environment, retired from ASU in May 2011. He served on the faculty of the University of Maryland for 26 years before becoming professor of Civil Engineering at ASU in 1999.

Witczak is an internationally recognized expert in the area of highway and airfield pavements. He has been involved in numerous worldwide consulting activities and has been invited to speak in all five continents. Witczak has received many honors and distinctions including the Asphalt Institute Honor Roll, Walter J. Emmons Award of the Association of Asphalt Paving Technologies and the Thomas B. Deen Distinguished Lectureship Award.

Witczak graduated with his PhD in Civil Engineering from Purdue University in 1969. Nearly 50 years later he has retired from academia after teaching 41 years of his professional career. His teaching experience has spanned Purdue University, The University of Maryland and Arizona State University. In addition to his academic career, he has had the great fortune to work on hundreds of consulting projects, in all corners of the globe, covering over 70 different countries.

The Last Lecture of Professor Witczak focused upon a critical assessment, via his own experiences, impressions and opinions, of how civil engineering education has changed for the good and bad over the last 50 years.

This year two of our faculty moved on to new appointments. Eric Williams, assistant professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability has joined the faculty at Rochester Institute of Technology and Panagiotis Mitropoulos, assistant professor in the Del E. Webb School of Construction has joined the College of Engineering at San Diego State University. We wish to thank them for their service and wish them good luck in their new positions.
student honors and awards

2012 International Road Federation (IRF)
63RD CLASS OF FELLOWS

The IRF Road Scholar Program identifies promising international students currently enrolled in graduate programs at IRF Member universities in the United States. The Executive Fellows are recommended by their professors, and must demonstrate not only great educational accomplishments, but a strong desire to use their education in their home countries.

As Executive Fellows, these students are invited to participate in the Road Scholar Program, alongside IRF’s current class of Traditional Fellows, which is designed to provide the Fellows with a better understanding of the process of doing business in the transportation industry in the United States, the importance of leadership, and the benefits and merits of the International Road Federation. The Road Scholar Program allows IRF members to make contact with some future international leaders before they return to their home countries.

Jeffrey Stempihar – Recipient of the Reed/Valley Slurry Seal Fellowship – Area of Academic Study: Pavements and Materials Engineering

Undergraduate Honors and Scholarships

Fall 2011 Barrett Honors: 57
Fall 2011 Merit Scholars: 297
Scholarships: 92 recipients
For a total of $297,863

Udall scholars advance tribal health care, environment

John Kondziolka, a junior concentrating on environmental engineering, is one of the recipients of the 2011 Udal Scholarships. Kondziolka wants to help develop sustainable water systems, becoming a leader in new technologies for water purification. He is active in the ASU chapter of Engineers Without Borders, and has worked on refurbishing a water system in a small village in Ecuador.

DEWSC AWARDS

Fall 2010
Outstanding Senior – Chase Farnsworth
Leadership and Service – Silvino Villanueva, Ashleigh Feiring, Josephine Bierwagen

Spring 2011
Outstanding Senior – Rebecca Freitas
Leadership and Service – Brittany Hoste

Fall 2011
Outstanding Senior - Kaitlyn Mulhollan
Leadership and Service – Alex Bertheau, Homero Garcia Jr.

CESE AWARDS

Spring 2011
Outstanding Senior – Joy Marcella

Fall 2011
Outstanding Senior – Amie Stockwell
Leadership and Service – Frederick Tack, Bobby Cottam
4.0 Award – Grant Dickerson
Construction students provide holiday gifts for children

Joshua Marriott and Ashley Bagley sort through toys collected for Cardon Children’s Medical Center.

This past holiday season, Joshua Marriott, a senior in the concrete industry management program, led an effort that obtained donations from more than a dozen local construction, engineering and concrete companies, and partnered with the Arizona Builders Alliance annual toy drive to collect truckloads of toys.

Marriott began the drive with some fellow members of ASU’s student chapter of the American Concrete Institute (ACI).

The ACI student chapter provided funds to buy posters to promote support for the toy drive. As word spread, the director of the state ACI professional chapter, Jim Rodgers, solicited donations from his group. James Ernzen, an associate professor in the Del E. Webb School of Construction programs, asked students in his classes to contribute.

More than 900 toys were contributed by ASU students and faculty and local companies, including Suntech, Cemex, Drake, Ninyo and Moore, the ACI Arizona Chapter, CSW, AMEC, Cal Portland, the Ira A. Fulton Schools of Engineering student advising office, Perlman and Perlman, Climotech, TDI, Kortman Electric, Sundt, T-Pac, DP Electric, Rural Electric and others.

With additional donations from Arizona Builders Association members, about 2,000 toys were delivered to the medical center a few days before Christmas.

Leila Kabiri-Badr, a PhD student in SSEBE, is one of 14 winners of the Achievement Rewards for College Scientists Scholarship.

Ali Fakhri, a PhD student in SSEBE, has been appointed by the City of Scottsdale Mayor Lane and Council Members to serve on the Development Review Board.

Engineering student one of 12 to receive national scholarship

Civil engineering junior Adriana Ruiz was named an Obama Scholar by the Hispanic Scholarship Fund (HSF) in August 2011. Ruiz received $2,500 at the beginning of the school year and will be awarded an additional $2,500 next year. The scholarship was given to 12 Hispanic students nationwide — including students from USC, Harvard and UA — who plan to pursue a career in teaching high school science, technology, engineering and math classes. Ruiz said she plans to pursue a teaching career in one of these fields after earning her master’s degree. The scholarship is funded by a donation of $125,000 to the HSF from President Obama’s 2009 Nobel Peace Prize award money.

Jorge Luis Amaya, a civil engineering undergraduate student, was selected for a competitive internship with the Federal Highway Administration over the summer of 2011. Out of 1,000 applicants Amaya was one of 100 who earned an internship position. He worked in D.C. at the FHWA agency and was recognized as one of the top 5 interns in the program at the conclusion.

Fariya Sharif, a PhD student in SSEBE, has been chosen as one of the 2011 Wateruse AZ Scholarship winners.

Vanessa Chavez has been selected to receive a Ford Graduate Engineering Fellowship for $5,000. Chavez received $2,500 in fall 2011 and $2,500 in spring 2012.

The Transportation Research Board 2011 Pyke Johnson Award for the Best Paper in the Planning and Environment topic areas was awarded to Karthik Konduri, PhD student, Xin Ye, former PhD student and post-doctoral researcher and Bhargava Sana, former graduate student. The paper was titled “Joint Tour-Based Model of Vehicle Type Choice and Tour Length.” Faculty advisor is Professor Ram Pendyala.
Kyle Doudrick’s paper entitled “Photocatalytic Reduction of Nitrate in Water Using Titanium Dioxide Loaded with Silver” won 3rd place in the Geosyntec’s Student Paper Competition for 2011.

Keith Christian, a master’s student in civil engineering, was selected to receive a 2011 Dwight David Eisenhower Graduate Fellowship. The estimated amount of the fellowship is $62,300 plus $1,500 to attend the 2012 TRB Annual Meeting in Washington DC. The objectives of the Dwight David Eisenhower Transportation Fellowship Program are to attract qualified students to the field of transportation and advance transportation workforce development.

Joy Marsalla, a student in ASU’s Barrett, The Honors College, was awarded one of the highly prized Tau Beta Pi fellowships to support students seeking graduate degrees in engineering.

Alexandra Polasko is the recipient of the Arizona Stockholm Junior Water Prize, Regional Water Prize Award Ricoh Sustainable Development Award, Excellence Award for Biological Sciences, and Association for Women in Science Silver Medal, Microbiology Division.

Amie Stockwell is the SSEBE awardee of the Graduate College Reach for the Stars $15,000 Fellowship.

Arjun Krishna Venkatesan has been awarded the Phoenix/Scottsdale Groundwater Contamination Scholarship for Environmental Science for 2010-12.

Kristen Barlish, recipient of the prestigious Fulbright Scholarship and the outstanding graduate award from the Del E. Webb School of Construction, is now working on her master’s in construction management. With a deep interest in building efficiency, she will travel to Italy to study how addressing facilities management needs upfront can lengthen the lifecycles of industrial buildings.

Elham Bani Hashem, a PhD student in Geotechnics/Pavement Materials, won the 2011 Helene M. Overly Memorial/Esther Kmetty Scholarship awarded by the Women’s Transportation Seminar Phoenix Metropolitan Chapter.

Helping to bring holistic approach to sustainable urban development

ASU engineering grad student Alexander Baish has a key role in a collaborative effort involving researchers at ASU and Mexico’s Monterrey Institute of Technology and Higher Education (commonly shortened to Tec de Monterrey). They’ve formed the Water Innovation Consortium to do the groundwork for providing the city of Monterrey and its suburbs a modern and sustainable water resources management system.

Monterrey is one of Mexico’s most prosperous cities but with a population of about four million the region is far from fully prepared for the rapid economic growth and land development it has been experiencing, and its lack of quality water resources infrastructure could threaten its opportunities for success.

Among the most critical of challenges is ensuring access to an adequate water supply and the safety of that water, and providing extensive flood protection. The need for the latter became dramatically clear when a rampaging flood resulting from Hurricane Alex pummeled the region last year.

Baish’s adviser, Enrique Vivoni, an associate professor in the School of Sustainable Engineering and the Built Environment and the School of Earth and Space Exploration, is a leader of the consortium—one of several sustainability projects Vivoni is conducting in Mexico.

Vivoni sent Baish to Monterrey last spring for a month of field work and data collection with partners at Tec de Monterrey. Baish is producing simulations that account for the topographical, environmental and meteorological conditions that made the area so vulnerable to flood waters from the hurricane storm. He is also helping set up workshops to educate the local populace and its government, industry and community leaders, and prepare them to contribute to the design process.
Doctoral Graduates

Spring 2011
Abdullah Alsanad
PhD Dissertation: Novel Biopolymer Treatment for Wind Induced Soil Erosion
Chair: Dr. Edward Kavazanjian

Simon Ghanat
PhD Dissertation: Duration characteristics of mean horizontal component of the shallow crustal earthquake records in active tectonic regions
Chair: Dr. Edward Kavazanjian

Seung Lim
PhD Dissertation: Quantitative Structure Analysis Relationships for Predicting the Fates of Future Contaminants in Indirect Potable Reuse Systems
Chair: Dr. Peter Fox

Summer 2011
Mehdi Bakhshi
PhD Dissertation: Controlling Early-Age Cracking and Improving Transport Properties to Achieve Sustainable Cement-Based Materials
Chair: Dr. Barzin Mobasher

Mohamed G. Arab
PhD Dissertation: The Integrity of Geosynthetic Elements of Waste Containment Barrier Systems Subject to Seismic Loading
Chair: Dr. Edward Kavazanjian

Fall 2011
Mohammad Abbaszadeh
PhD Dissertation: The Effect of Cracks on Unsaturated Flow and Volume Change Properties of Expansive Clays and Impacts on Foundation Performance
Chair: Dr. Sandra Houston

Carlos Cary
PhD Dissertation: Characterization of the Pore Water Pressure Response of a Soil Subjected to Traffic Load
Chair: Dr. Claudia Zapata

Mehlika Kiser
PhD Dissertation: Fate of Engineered Nanomaterials in Wastewater Treatment Plants
Chair: Dr. Paul Westerhoff

Jie Sheng
PhD Dissertation: Downstream Processing of Synechocystis for Biofuel Production
Chair: Dr. Bruce Rittmann

Doctoral Graduates in the new Construction Management Program

Fall 2010
Leonard Robert Kawecki
PhD Dissertation: Environmental Performance of Modular Fabrication: Calculating the Carbon Footprint of Energy Used in the Constructions of a Modular Home
Chair: Dr. Howard Bashford

Summer 2011
Marcel M. Maghiar
PhD Dissertation: Crew Coordination Modeling in Wood-Framing Construction
Chair: Dr. Avi Wiezel

Graduate Fellowships

Dean's Fellowship $25,000
Alexander Baish
James Gifford
David Hanigan
Chase Holton
Levi Straka
Kirk Vance

Fulton Fellowship $5,000
David Hanigan
Benjamin Rehder
Levi Straka

Science Foundation Arizona (SFAz) Fellowship $25,418
Bridget Cavanagh
Isaac Roll
Daniel Rosenbalm
Congratulations to the following students on their achievement and a special thank you to the donors for their contributions. Total scholarships were awarded in the amount of $297,863.

### DEL E. WEBB SCHOOL OF CONSTRUCTION

<table>
<thead>
<tr>
<th>Scholarship Name</th>
<th>Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.G.C. Construction ASU Student Scholarship</td>
<td>Jacob Carver, Brennon Fish, Joshua Marriott, Jonathan Meek, Joshua Mischung, Adam Walter</td>
</tr>
<tr>
<td>Advancing Minorities in Construction Award</td>
<td>Cynthia Barela, Enrique Collazo, Eduardo Duenas, Robert Kong, Alejandro Mota, Angel Rosas, Luis Ruiz</td>
</tr>
<tr>
<td>Andrew Hanneman Scholarship</td>
<td>Jonathan Meek and Natalie Wilkins</td>
</tr>
<tr>
<td>Bechtel Construction Scholarship</td>
<td>Ashley Bagley, Joshua Brown, Che Chavez, Gaired Fressadi, James Padilla, Kelly Reimers, Adam Walter</td>
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<tr>
<td>Ben C. Griggs Memorial Scholarship</td>
<td>William Fugett</td>
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<tr>
<td>CFMA Joseph J. Ouigley Memorial Scholarship</td>
<td>Kaitlyn Muhoian and Jared Stradling</td>
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<tr>
<td>Charles and Nancy O’Bannon Scholarship for Construction</td>
<td>Alyssa Ersparmier</td>
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<tr>
<td>D. L. Withers Construction Scholarship</td>
<td>Lindsay Johnson</td>
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<tr>
<td>Daniel and Katherine Mandan Scholarship</td>
<td>James Padilla</td>
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<tr>
<td>Dave Clifton Memorial and ASPE Chapter 6 Scholarship</td>
<td>Joshua Marriott</td>
</tr>
<tr>
<td>Del E. Webb Foundation Finance and Accounting Scholarship</td>
<td>Carolyn Gaxiola and Amanda Nichols</td>
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<tr>
<td>Del E. Webb Foundation Undergraduate Student Scholarship</td>
<td>Bryan Langdorf</td>
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<td>Del E. Webb Foundation Women in Construction Scholarship</td>
<td>Jessica Metier</td>
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<tr>
<td>Del E. Webb Memorial Scholarship</td>
<td>Joshua Mischung and Kimberly Rahberger</td>
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<td>Dr. Sandra L. Weber Memorial Scholarship</td>
<td>Rayna Koon</td>
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<tr>
<td>FNF Construction, Inc. Scholarship</td>
<td>Domenic Syer</td>
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<tr>
<td>Frank M. Chandler Memorial Scholarship</td>
<td>Cassandra Hudiec</td>
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<td>James Fann Memorial Scholarship</td>
<td>Jacob Carver, Justin Kiduff, Michael Lynch</td>
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<td>Jan Bennettt Endowed Scholarship</td>
<td>Nathaniel Gorrocino</td>
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<td>Jason McElroy Memorial Scholarship</td>
<td>Ryan Ramos</td>
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<td>Jerry King Scholarship</td>
<td>Jonathan Meek</td>
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<tr>
<td>Jim Beboud Scholarship</td>
<td>Joseph De Matteis</td>
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<tr>
<td>Native American Construction Management Scholarship</td>
<td>Leonard Black, Kammy Harding, Joshua Lisson, Buu Nygren, Jeffrey Yazzie, Sylvester Yazzie, Lecton Zomme</td>
</tr>
<tr>
<td>Opus West Construction Corporation Undergraduate Scholarship</td>
<td>Benjamin Swanson</td>
</tr>
<tr>
<td>PENTA Building Group Scholarship</td>
<td>Ashley Bernardze, Skyler Holloway, Cassandra Hudec, Lindsay Johnson, Chase Roberts, William Scott</td>
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<tr>
<td>Pulte Home Corporation Scholarship</td>
<td>Adam Walter</td>
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<tr>
<td>R. Glen Schoeffler Scholarship</td>
<td>Gary Aanenson</td>
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<tr>
<td>Robert H. Johnson Undergraduate Scholarship</td>
<td>Brennon Fish, Brandon Gallimore, Skyler Holloway, Kimberly Rahberger</td>
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<td>Robert J. Wheeler Memorial Scholarship</td>
<td>Joshua Brown, Michael Lynch, Brian Park</td>
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<td>Ron Pratte Scholarship</td>
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<td>Samuel F. Kitchell Undergraduate Leadership Award</td>
<td>William Brandon, Che Chavez, Brennon Fish, Gaired Fressadi, Brad Jensen, Rayna Koon, Joshua Mischung, Kimberly Rahberger, Christian Sosinski, Adam Walter, Ryan Whitt</td>
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<tr>
<td>The Ames Family Scholarship</td>
<td>Sabrina Scott and William Scott</td>
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<tr>
<td>The Beavers Heavy Construction Scholarship</td>
<td>Rayna Koon and Luis Ruiz</td>
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<tr>
<td>William G. Rein Construction Scholarship</td>
<td>Kelly Reimers</td>
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### CIVIL, ENVIRONMENTAL & SUSTAINABLE ENGINEERING

<table>
<thead>
<tr>
<th>Scholarship Name</th>
<th>Recipients</th>
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<tbody>
<tr>
<td>APS Diversity Scholarship</td>
<td>Jose Reyes</td>
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<tr>
<td>Arizona Society of Civil Engineers (AzSCE) Scholarship</td>
<td>Michaela Doherty</td>
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<tr>
<td>Arlo Richardson Endowed Scholarship</td>
<td>Ryan Sariego</td>
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<tr>
<td>Carl L. and Jean Woicott Meng Memorial Scholarship</td>
<td>Andrew Chil</td>
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<tr>
<td>Charles and Nancy O’Bannon Scholarship</td>
<td>Elizabeth Barnes</td>
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<tr>
<td>Charles Lemon Memorial Scholarship</td>
<td>Bryan Wright</td>
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<tr>
<td>CIRC Scholars Program</td>
<td>Jorge Amaya, Melissa Archer, Christopher Gino, Antonio Lopez, Nathan Merrill, Ivan Ramirez, Ashley Welton</td>
</tr>
<tr>
<td>CIRC/METS Scholars Program</td>
<td>Matthew Aguayo, Erick Barrios Ponce, Triana Gonzalez Neves, Cari Henning, Brannon Maldonado, Lauren McMurrant, Breeann Sharma</td>
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<tr>
<td>Civil and Environmental Engineering General Scholarship</td>
<td>Bobby Cottman, Triana Gonzalez Neves, Sam Grombacher, Cari Henning, Jose Reyes, Jacob Vander Vis</td>
</tr>
<tr>
<td>Elyse and Paul Johnson Scholarship</td>
<td>Nathan Dunkin</td>
</tr>
<tr>
<td>Jan Tuma Memorial Scholarship</td>
<td>Erick Barrios Ponce</td>
</tr>
<tr>
<td>Kenneth R. and Kathryn Geiser Memorial Scholarship</td>
<td>Lindsey Beames</td>
</tr>
<tr>
<td>Kiewit Companies Scholarship</td>
<td>Erick Barrios Ponce and Ashley Bagley</td>
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<tr>
<td>Martin H. Rosness Memorial Scholarship</td>
<td>Jan Joseph Bitoon</td>
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<tr>
<td>Marvin Sheldon Memorial Scholarship</td>
<td>Sara Toovey</td>
</tr>
<tr>
<td>Mike Kelling Memorial Scholarship</td>
<td>Nicholas Palmer and Cynthia Barela</td>
</tr>
<tr>
<td>National Association of Corrosion Engineers (NACE) Arizona Section Scholarship</td>
<td>Tate Jensen</td>
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<tr>
<td>Paragon Structural Design, Inc. Scholarship</td>
<td>Benjamin Immonen</td>
</tr>
<tr>
<td>Rod J. McMullin SRP Water Resource Scholarship</td>
<td>John Kondolika and Joshua Steele</td>
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<tr>
<td>Stanley Consultants Scholarship</td>
<td>George Whitten</td>
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<tr>
<td>Terry Bourland Memorial Scholarship</td>
<td>Vanessa Chavez</td>
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<tr>
<td>Wood, Patel and Associates, Inc. Scholarship</td>
<td>Sam Grombacher</td>
</tr>
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</table>
Students shine at construction competition

Each year ASU students travel to Reno, NV to compete in the Associated Schools of Construction (ASC) competition. This year 50 students consisting of eight teams competed against teams from universities and colleges in the West Coast and Southwest that have construction management programs.

ASU placed first in the Determining Project Risk competition that challenged students to assess the risks for the construction of a large medical and research building for the University of California in San Francisco. Students had to show how they would manage costs and work schedules, negotiate subcontractor services and work out site logistics.

The Design-Build team took third place in the Design-Build category. Students had to devise viable plans for a 1,100 stall parking structure that could be integrated into an adjacent casino/amphitheater complex in Tucson. The project had to be cost-estimated, designed and built within roughly one year.

Teams were judged by representatives of companies who worked on these actual projects. Besides showcasing their skills, students met with industry recruiters. Many companies in construction and related businesses sponsor the competitions. ASU’s teams are supported in part by more than 20 local construction companies, some of whose employees volunteer time to mentor student teams.

The primary goal of the competition is to prepare students for their eventual careers in construction by working through real-life problems and scenarios that they actually might encounter.

ASU competed with teams in the following problem categories: LEED, BIM, Determining Project Risk, Design Build, Commercial, Heavy/Civil, and Electrical Concrete. All teams gave solid efforts and represented ASU well.

Friends of Civil Engineering

Friends of Civil Engineering (FOCE) in the School of Sustainable Engineering and the Built Environment Civil Engineering program help support our students to achieve success. FOCE supports a variety of student activities, including:

- Textbook scholarships to offset expenses
- Travel to research meetings and conferences
- Mixers to help students make industry connections
- Student organizations projects and outreach in the community
- Commencement luncheon honoring new graduates

2011 member list

AMEC Environment & Infrastructure, Inc.
Black & Veatch Corporation
Carollo Engineers
Coe & Van Loo Consultants, Inc.
Consultant Engineering, Inc.
Dibble Engineering
Entellus, Inc.
Erie & Associates
FNF Construction, Inc.
Harvard Investments, Inc.
HilgartWilson, LLC
Kiewit
Kimley-Horn and Associates, Inc.
Michael Baker Corporation
Nabar Stanley Brown, Inc.
Prelude Engineering Consultant Services
RBF Consulting, a Michael Baker Company
T & S Diversified
Historically, the United States has never recovered from an economic downturn without a corresponding resurgence of the construction industry.

Today 10 percent of American jobs are dependent on the construction and related design industries, so it’s critical that effective strategies be implemented to spark their recovery.

The Alliance for Construction Excellence (ACE) at Arizona State University has been studying the impact of the extended economic recession on the construction industry with the goal of helping it chart a path toward renewed prosperity. To expand that effort, ACE is organizing and guiding a series of think tank sessions, bringing together industry leaders from around the country to address questions pertinent to that goal.

“The recession has altered our industry's methods of delivering its services, changed business owners’ attitudes and reduced profit margins,” Aller says. “The balance of power has shifted into a buyer's market in which owners are driving contracting methods and influencing the construction process.”

Equally critical issues are intensifying international competition, the increasing impacts of the global economy, decreasing profit margins, reduced government funding and fewer public-private partnerships, lack of productivity, and industry consolidation trends. Such issues will be addressed at future think tank sessions.

“We want to provide the industry the data and the guidance it needs to develop informed strategies to deal with what appears to be an uncertain future,” Aller says.

Aller and other think tank participants identified numerous areas in which the industry’s business models need to be reformulated if recovery is to proceed.

The major challenges include the impact of technological advances, diminishing workers’ skill levels, labor shortages, credit and financing uncertainty and reduction of union influence.
Modernizing public infrastructure is among the major challenges facing municipalities throughout the United States. So it’s certain that a branch of construction engineering called trenchless technology is about to become a more active field.

The field involves advanced sustainable construction methods and technologies for installing, repairing or replacing underground infrastructure systems with far less disruption to roadways, businesses and homes than conventional underground construction techniques.

Arizona State University has one of the nation’s trenchless technology leaders in professor Samuel Ariaratnam, the chair of the construction engineering program in the Del E. Webb School of Construction Programs, which is part of the School of Sustainable Engineering and the Built Environment. He and Jason Lueke, assistant professor in SSEBE, are performing several research projects focusing on underground infrastructure issues.

Ariaratnam established a student chapter of the North American Society of Trenchless Technology (NASTT) several years ago. This club focuses on the importance of educating today’s students in an area of expertise that will be critical to the country’s future.
Developing a transportation system that is smart, sustainable, and resilient

With an aging infrastructure that is being tasked to accommodate an ever-increasing amount of passenger and freight travel, transportation networks are increasingly vulnerable to shocks in an era of diminishing resources and heightened sensitivity to sustainability considerations. Ongoing research activities are aimed at developing the computational tools and theoretical models needed to better plan, operate, and design multimodal transportation networks under a wide range of system conditions and geographical contexts.

New computational model systems capable of simulating the daily travel patterns of individual residents in a region have been developed and applied to assess the traffic, energy, and air quality impacts of new light rail alignments, changes in fuel prices, and extreme events. Using new theories that explain how drivers behave in different traffic conditions, researchers are developing more accurate computer models that can better predict congestion and prevent bottlenecks before they occur. These models have been further extended to develop decision support systems capable of identifying locations that are prone to high crash occurrence, providing the ability to take preventive measures before safety is compromised.

A number of research activities are underway to analyze the economic and environmental efficacy of implementing a high speed rail network in the nation. Researchers are conducting life cycle analysis of high speed rail systems, forecasting ridership on proposed corridors, and assessing the energy and air quality impacts within a sustainability framework.

Our transportation faculty members are engaged in cutting edge research to develop the next generation of transportation systems that are smart, sustainable, and resilient.

Safe and efficient transportation networks are vital to ensuring the economic competitiveness of a region and providing a high quality of life for residents and visitors.
How do hybrid and plug-in hybrid electric vehicles stack up against gasoline-powered cars?

Given currently available technologies, hybrid and plug-in hybrid vehicles with small battery packs win out over conventional gasoline-powered and all-electric automobiles with large battery packs.

That's according to recent research by Mikhail Chester, assistant professor in the School of Sustainable Engineering and the Built Environment and colleagues at Carnegie Mellon University and the RAND Corporation. Chester and his partners determined the total costs of travel for each kind of vehicle. In addition to purchase, maintenance, and operation costs, their life-cycle cost valuation includes human health impacts, environmental impacts and oil displacement benefits.

In the average electricity mix, their results show that small battery pack vehicles produce lower total costs than other vehicles. The study includes assessment of life-cycle considerations that include manufacturing, electricity generation, and vehicle operation in numerous counties throughout the United States.

It's an important finding considering the use of government incentives to encourage consumers to opt for alternative-fuel vehicles in the effort to reduce dependency on oil and reduce polluting emissions. The team's research results show that the American Recovery and Reinvestment Act of 2009, which provides a tax credit of up to $7,500 for up to 200,000 vehicles, might produce more benefit if directed at hybrids or plug-ins with small battery packs.

“It's possible that in the future plug-in vehicles with large battery packs might offer the largest benefits at competitive costs if the right factors fall into place, including sufficiently low-cost batteries, high gasoline prices, low emission electricity and long battery life,” Chester says. “But such a future is not certain, and in the near term HEVs and plug-in vehicles with small battery packs provide more emissions benefits and oil displacement benefits per dollar spent.”

An ASU engineer helps determine the most cost-effective and environment-friendly options among conventional gasoline-powered automobiles and newer alternative-fuel vehicles.
feature story

Chemicals used to fight pests may affect human development

An arsenal of chemicals is used to effectively battle noxious pests. The costs to human health from pesticide exposure, however, have not received adequate scientific attention.

Rolf Halden, a researcher at Arizona State University's Biodesign Institute and School of Sustainable Engineering and the Built Environment, joined forces with key collaborators from other major research institutions, to study two particularly pervasive pesticides, examining their levels in utero and the effects of these chemicals on newborns. The group's research – the first of its kind to examine the health implications of two leading pesticides during fetal development – recently appeared in the journal Environmental Science & Technology.

Due to the widespread use of pesticides, humans are exposed to an assortment of these chemicals throughout their lives. Chlordane and permethrin, two common chemicals, are the focus of Halden's multi-institutional team involving Arizona State University, Johns Hopkins University, the National Cancer Institute and Emory University.

Chlordane, having been identified as a likely human carcinogen, was banned from use in 1988. It remains a human health issue long after its discontinued use, however, as it is known to persist in the environment along with other such organohalide chemicals. Halden stresses: "Chlordane is just one of many mass produced organohalides that are detectable in the U.S. environment, where they cause ecological and human health concerns, due to their inherent persistence, toxicity and strong tendency to bioaccumulate in living organisms, including humans."

Permethrin, known as a pyrethroid insecticide, doesn't share chlordane's long-term persistence in the environment, but is nevertheless of serious health concern. It is one of the most broadly used pesticides today—applied for commercial and residential insect control, for food and feed crops, on clothing and as part of mosquito abatement programs.

The health effects from environmental contaminants like chlordane and permethrin are a matter of growing concern, particularly during sensitive stages of fetal development. Halden notes that the human immune system is vulnerable to changes caused by such chemicals. White blood cells including lymphocytes (T and B cells), natural killer (NK) cells and monocytes, which can mature into macrophages and migrate to other tissues, are all part of the complex fabric of immunity.
Morals and machines

According to Brad Allenby, professor in SSEBE and associate director of the Lincoln Center for Ethics, we’re already behind the curve in developing laws, policies and guidelines to deal with issues and controversies sure to arise as the robotics explosion potentially spawns a more interwoven technohuman world.

Technological advances are making it feasible that robots could become inextricably intertwined in most aspects of society – health care, transportation, personal security, national defense, law enforcement, even childcare, government and the economy.

Robot scientists are incorporating technology with humans in ways that could threaten cultural and ethical ideas. Allenby has written his views in a book review titled “Morals and machines” in Nature magazine.

“Robot Ethics: The Ethical and Social Implications of Robotics,” is an anthology edited by two philosophers and a computer scientist that presents various experts’ perspectives on the complex questions that are in need of answers as robots expand their reach into daily life.

Allenby provides a guide to challenges addressed by the book’s contributors, noting how the authors offer the value of sometimes sharply differing views on how to address those challenges.

Among interesting questions pondered:

Should robots be able to understand the laws governing warfare before being deployed in military actions?

Should they not be trusted in roles as caregivers unless they can be given ability to understand human emotion?
Can water disinfection be sustained without chemicals?

The focus of this research has been on technologies that can prevent the formation of scale in both domestic and industrial water systems. Technologies such as template assisted crystallization can effectively prevent scale formation in many systems. Developing a fundamental understanding of how these technologies work is critical to applying them for different water qualities. Research is also being done on antimicrobial coatings and materials to determine if disinfection can be sustained without chemical addition.

Peter Fox continues to do research on water reuse and groundwater recharge systems. Relationships between sub-surface travel and surface area have been developed and demonstrate why most groundwater recharge systems in the world provide similar levels of treatment. When travel times are used as a design parameter, the sub-surface surface does not vary significantly for common types of aquifer materials. Present research is attempting to experimentally verify the modeling results.

Recently, Fox completed a study where over 2000 compounds in the FDA data base were analyzed to determine their potential as future contaminants in indirect potable reuse systems. The study concluded that in the future, the majority of new pharmaceutical compounds will be produced by biotechnology and should not be as persistent as synthetic compounds.
Integrating technologies for water resource predictions in the southwest US

Arid and semiarid hydrosystems in the southwest U.S. are susceptible to a wide array of environmental challenges related to human activities. For example, anthropogenic climate change will significantly increase air temperatures in the next century, in the range of 1 to 4 °C, with a myriad of consequences on the natural and built environment. These pending changes require that engineering systems related to water supply and quality be retrofitted or altered in their operation to meet changing conditions and growing demands.

**Enrique Vivoni**, associate professor in the School of Sustainable Engineering and the Built Environment and the School of Earth and Space Exploration, is undertaking several, multi-year efforts to study arid and semiarid watersheds in Arizona, New Mexico and Sonora, Mexico. These studies involve the integration of technologies for environmental monitoring, imaging and prediction in rangeland basins that act as a source of water and sediment as well as mediate energy and carbon exchanges with the atmosphere. Technologies include distributed sensor networks, unmanned aerial vehicles and high performance computer modeling.

By combining field and modeling methods, the team is laying the ground work to study the impacts of climate change and land use alterations on the water resources of the southwest US. These predictions will help society better assess future water availability in the natural and built environment and how engineering methods may help in adapting to impending changes.

**Principal Investigator:** Enrique Vivoni, Associate Professor

**SSEBE Graduate student Nolie Pierini installs wiring for soil moisture and temperature sensors and a rain gauge at the Santa Rita Experimental Range near Green Valley, Arizona (Photo: Tom Story)**

A team of graduate students in SSEBE, including **Ryan Templeton (MS, 2011)**, **Nolie Pierini** and **Cody Anderson**, are comparing the water, energy and carbon dynamics in two rangelands:

- Sonoran Desert savanna near Green Valley, Arizona and
- Chihuahuan Desert shrubland near Las Cruces, New Mexico.

Initial efforts have revealed the spatial and temporal variability of rainfall, soil moisture and runoff within each watershed.

Importantly, the team has found that using the distributed soil moisture measurements improved the estimation of evapotranspiration, the major water loss in these hydrosystems, as a residual of the watershed water balance.
Current research in geotechnical engineering at ASU includes both experimental work and numerical analysis. ASU continues to remain one of the leading institutions for studying the engineering behavior of unsaturated soils and the ISTB-2 laboratory is one of the premier facilities in the world for testing of unsaturated soils.

Current unsaturated soils research includes a continued focus on the effect of environmental conditions on the performance of pavement and airfield subgrades based on stochastic approaches as well research on cracking of soils and the properties of cracked and expansive soils. This work is supported by the National Science Foundation (NSF) and the Transportation Research Board and includes analytical components as well as experimental work. NSF-sponsored research on development of student-centered lecture and laboratory modules on the basic principles of unsaturated soils theory is also being conducted.

Ongoing experimental work in the Enamul and Mahmuda Hoque Geotechnical Laboratory includes NSF supported work on the post-liquefaction behavior of soils and on microbial induced carbonate precipitation for soil improvement. The work on post-liquefaction behavior of soil is a collaborative project with Stanford University and Bucknell University and will take ASU students to U.C. Davis for testing on the shared-use dynamic geotechnical facility there.

Ongoing ASU geotechnical research also includes collaborative work with the U.C. San Diego and industrial partner Geosyntec Consultants on numerical analysis of the integrity of geosynthetic elements of waste containment systems subject to extreme loads under the NSF GOALI (Grant Opportunities for Academic Liaison with Industry) program.
The team at the Swette Center is working at the forefront of engineering and science endeavors to “manage microbial communities” in ways that could provide more sustainable processes to produce energy from renewable sources, clean up pollution and keep water supplies uncontaminated.

Rittmann reports on progress in his field – for instance, development of a “photosynthetic factory” that uses photosynthesis to make bacteria into fuel molecules, resulting in what could become a viable nonpolluting alternative to burning fossil fuels.
The laboratory is fully equipped to perform a variety of applied microbiological analyzes such as detection of parasites and viruses by cell culture and advanced molecular techniques; Cryptosporidium and Giardia viability and disinfection studies; evaluation of water treatment efficiencies including coagulation and filtration performance; coliform regrowth, biological treatment, microbial disinfection studies and the detection of Giardia and Cryptosporidium in water samples using microscopy.

There are three segregated areas for the cell culture assays, PCR sample preparation and epifluorescence microscopy. The cell culture and PCR laboratories are equipped with UV lights and positively pressured with Hepa filtration systems to significantly reduce any chance of sample contamination. The microbiology research laboratories are well equipped for the performance of all areas of water microbiology, pathogen monitoring and molecular tracking of microbes.
Arizona State University’s construction programs are considered among the very best in the nation, based in no small part to the contributions and support of William “Wink” Ames, founder of Minard-Ames Insurance Group.

Mr. Ames’ advocacy for the construction industry and education has spanned generations. Wink grew up in the construction industry and has continued the legacy of his father, Bill Ames. Wink is a particularly strong advocate for students. He has taught graduate and undergraduate classes for decades. He spent 20 years on the Industry Advisory Council, and has served Fulton Engineering as the first chair of the recruitment and recognition committee. During this time, he launched the inaugural construction recognition banquet, which will celebrate its 22nd anniversary this year.

He has also encouraged greater diversity in the industry. Wink has endowed scholarships to help recruit African-American and female students to the construction programs at ASU. In the fall of 2007, ASU honored Wink with its Alumni Appreciation award at Homecoming.

Recently, the Beavers Charitable Trust, a nonprofit organization that promotes education and assists students pursuing careers in the heavy construction industry, established a Heavy Construction Chair endowment in honor of Bill Ames and Wink Ames at ASU. Wink and friends have given to the endowment, providing Fulton Engineering a strong tool to attract more high-caliber faculty.

The holder of the chair will have a leading role in developing a bachelor of science program in construction engineering, as well as strengthening the existing heavy construction emphasis in the Del E. Webb School of Construction programs.

“I have received a lot of fulfillment from serving the construction industry,” says Ames. “I hope I will leave it in a better place. It has been a fun ride.”
Emerson Ward, a 2006 graduate of ASU’s Del E. Webb School of Construction, has been involved in more than a dozen construction and renovation projects on the university’s campuses through his job as a project manager for Core Construction Services.

Since graduating in 2006 with a bachelor’s degree in construction management from the Del E. Webb School of Construction Programs, Ward has been helping to build many of the university’s newer facilities and renovate older ones.

He’s now in his sixth year with CORE Construction Services of Arizona, Inc. – a company that does more than $700 million a year in business in seven states – where he rose to a project manager position in just two years.

Ward has managed more than a dozen projects at ASU – large and small jobs adding up to more than $60 million in construction work – including a new and extensively modernized university police department facility on the Tempe campus and renovations of Sun Devil Stadium and the Memorial Union student center.

That list also includes renovations of the Psychology Main Building and labs for the Department of Psychology’s Behavioral Neuroscience Program. In addition he’s worked on projects to fortify seven buildings with new roofing systems, enabling them to support arrays of photovoltaic panels as part of the university’s efforts to use solar energy to power more of its facilities.

Elsewhere in the community he’s been involved in construction for the Deer Valley Unified School District, Gilbert School District and the city of Apache Junction. He also recently helped complete a new police and courts center in Tolleson.

Current ASU projects include reroofing of the Wells Fargo Arena, the Student Services building and Interdisciplinary Building B on the Tempe campus, plus construction of a student housing facility and dining hall on the university’s Polytechnic Campus.

“For me, it’s great to be part of making the campuses better places,” Ward says. “I’m very passionate about it, because the quality of what we’re building will contribute to the aesthetics of the campuses and create environments conducive to students’ success, and it will all have an impact on the character and progress of ASU far into the future.”
ASU grad Rob Jeter, now an engineer for the U.S. Department of State, was part of an emergency-response effort after the devastating 2010 earthquake in Haiti. Jeter who earned the class of 1997 Outstanding Senior Award in what was then ASU’s Department of Civil and Environmental Engineering now works for the Office of Design and Engineering in the U.S. Department of State's Bureau of Overseas Building Operations. Jeter has also worked in Afghanistan, Pakistan, Yemen, Mauritania, Chile, Finland, Lebanon, England and Germany. In all he’s worked in at least 20 different countries since joining the State Department early in 2008.

Lori Ann Stevens, LEED AP, recently joined the San Diego business unit of Turner Construction Company as a Senior Project Manager. Stevens will be responsible for managing projects within Turner's Special Projects Division, as well as assisting with Business Development. She received her bachelor's degree in Construction Management from ASU and her master's degree in Civil Engineering from San Diego State University.

Two alumni of ASU’s Del E. Webb School of Construction Programs were recently honored by the Construction Financial Management Association (CFMA) for their contributions to the industry. The national organization's 2011 Arizona Construction Industry Pioneer Award was given to Ron Rodgers, former president of J.B. Rodgers Mechanical Contractors. He graduated from ASU with a degree in construction management in 1977. CFMA's 2011 Arizona Construction Executive of the Year Award went to Mike Fann, president of Fann Contracting. Fann earned his construction management degree in 1980.

Lieutenant Colonel Corey Spencer, a graduate of the DEWSC construction management masters’ program, became Deputy Commander of the U.S. Army Corps of Engineers (USACE) Afghanistan Engineer District-South (AED-South), based on Kandahar Airfield, on August 6, 2011. As Deputy Commander, Lieutenant Colonel Spencer assists in leading AED-South in its design and construction programs and directs the day-to-day operations of the District’s staff. He was commissioned into the U.S. Army Corps of Engineers following graduation from Colorado State University in 1991 where he earned a bachelor's degree in construction management. He holds a master's degree in construction management from Arizona State University. His military education includes the Engineer Officer Basic and Advance Courses, and the Command and General Staff College.

John W. Nicklow, PhD, earned his doctorate in civil engineering from Arizona State University in 1998 under the supervision of Professor Larry Mays, has been named Southern Illinois University Carbondale's new provost and vice chancellor for academic affairs. Nicklow joined the faculty as an assistant professor in the Department of Civil and Environmental Engineering in 1998. He became an associate professor in 2003 and was promoted to professor in 2007. He served as acting chair of the department from July through December 2005, and was interim associate dean of the College of Engineering from 2006 to 2007. He became permanent associate dean in 2007.

Debra Larson, PhD, earned her doctorate in civil engineering in 1994 from Arizona State University, has been named dean of the College of Engineering at California Polytechnic State University. Larson joined Cal Poly Engineering as dean on August 22, 1011. She previously served as the associate vice provost at Northern Arizona University (NAU) in Flagstaff, AZ where she led and managed the business systems, student and curricula processes, and policies of academic affairs. She holds the academic rank of professor; is a licensed professional engineer in the states of Oregon and Arizona; is well-known for her activities in engineering education; and serves as an ABET EAC evaluator. Larson's academic career began in 1994, after an earlier career as a civil and structural engineer working in manufacturing, product development and sales, and consulting.

Kent Dibble (BSCE 1975 Arizona State University), president of Dibble Engineering, has been recognized by the American Public Works Association for achieving Lifetime Membership Status after having served 30 years in the organization. Dibble Engineering and Caruso, Turley and Scott were the engineers on the new Chandler City Hall. This project is listed in the Engineering News-Record (ENR) Best of the Best top projects of 2011 in the government/public building category.
Morteza Abbaszadegan, PhD
Professor, PhD, University of Arizona
Morteza.Abbaszadegan@asu.edu
(480) 965-3868

Research Expertise: Contemporary water quality issues related to health-related water microbiology including microbial detection methodologies, pathogens inactivation and removal mechanisms during water treatment processes, water quality in water distribution systems and microbial monitoring of source waters. He has developed many new techniques for the detection of viruses, bacteria and parasites in water environments.

Abbaszadegan is a professor of environmental microbiology/engineering and founding director of the National Science Foundation (NSF) Water & Environmental Technology (WET) Center at Arizona State University. The NSF Center provides a platform to address issues as diverse as water quality by capitalizing the strengths of partner organizations. He joined the school in 1999 after spending more than six years as a microbiology research manager in private industry. He developed three different courses for the program including an Environmental Microbiology course (CEE 467/567) for engineers.

Honors and Distinctions: Abbaszadegan has authored more than 100 research manuscripts, book chapters and reports in the area of environmental microbiology and engineering. He serves as Editor of the Journal of Water and Health, an IWA publishing, and successfully established NSF Centers in Water Quality and Environmental Technology at ASU. He has also served on several national and international committees and currently is the Chair, Section 9510, Detection of Enteric Viruses for Standard Methods. Abbaszadegan received the Outstanding Research Team Award, University of Arizona.

Selected Publications:

Soyoung Ahn, PhD
Assistant Professor, PhD, University of California-Berkeley
Soyoung.ahn@asu.edu (480) 965-1052

Research Expertise: Traffic flow analysis and modeling, safety effects of traffic flow features, congestion management and mitigation, applications of intelligent transportation systems for mobility and safety improvements.

Honors and Distinctions: Ahn is a recipient of the National Science Foundation CAREER award (2012-2017). Ahn serves as a member of the Traffic Flow Theory and Characteristics committee of the Transportation Research Board and a member of the Editorial Board of Transportation Research Part B.

Selected Publications:

Braden Allenby, PhD, JD
Professor, PhD, Rutgers University
Braden.Allenby@asu.edu (480) 727-8594

Research Expertise: Sustainable engineering, Design for Environment, industrial ecology, engineering and applied ethics, transhumanism and emerging technologies, and earth systems engineering and management.

Honors and Distinctions: Brad Allenby is the Lincoln Professor of Engineering and Ethics, and of Law, past President of the International Society for Industrial Ecology, ex-Chair of the AAAS Committee on Science, Engineering, and Public Policy, Chair of the IEEE Presidential Sustainability Initiative, an AAAS Fellow, an AT&T Industrial Ecology Fellow, a Batten Fellow at Darden Business School at the University of Virginia, and a Fellow of the Royal Society for the Arts, Manufactures & Commerce. Allenby is also the founding chair of the Consortium for Emerging Technologies, Military Operations, and National Security; founding director of the Center for Earth Systems Engineering and Management; and Associate Director of the Lincoln Center for Applied Ethics.

Selected Publications:
In the past year, Allenby has had four books published:
Industrial Ecology and Sustainable Engineering (with Tom Graedel, published by Pearson/Prentice-Hall);
The Theory and Practice of Sustainable Engineering (published by Pearson/Prentice-Hall);
The Techno-Human Condition (published by MIT Press); and
The Growing Gap Between Emerging Technologies and Legal/Ethical Oversight (co-edited with Gary Marchant and Joe Herkert, published by Springer).
Samuel Ariaratnam, PhD, PE, P.Eng.
Professor and Construction Engineering Program Chair, PhD, University of Illinois at Urbana-Champaign
ariaratnam@asu.edu (480) 965-7399

Research Expertise: Sustainable urban underground infrastructure systems with an emphasis on horizontal directional drilling and trenchless pipe replacement

Samuel Ariaratnam is a professor in the Del E. Webb School of Construction in the School of Sustainable Engineering and the Built Environment. He received his B.A.Sc. in Civil Engineering from the University of Waterloo (Canada) and his M.S. and Ph.D. from the University of Illinois at Urbana-Champaign.

Honors and Distinctions:
Ariaratnam has published over 175 technical papers, holds three patents, co-authored five textbooks, and is active in numerous professional organizations.

In 2003 he was presented with the Young Civil Engineer Achievement Award from the University of Illinois at Urbana-Champaign. He is a past recipient of the John O. Bickel Award from the American Society of Civil Engineers (ASCE) and was named to the Phoenix Business Journal’s prestigious “Top Forty under 40” list in 2006. Currently, he serves as the Chairman of the International Society for Trenchless Technology. Recently, Ariaratnam was named the "2012 Trenchless Technology Person-of-the-Year" by Trenchless Technology Magazine.

Ariaratnam is a registered professional engineer in the State of Arizona and the Province of Ontario (Canada).

Selected Publications:

Howard Bashford, PhD, PE
Associate Professor, PhD, Brigham Young University
Howard.bashford@asu.edu (480) 965-4513

Research Expertise: Design of Production Systems for Construction Residential construction issues

Howard Bashford owned and operated an engineering consulting firm for 19 years and a construction development company for 8 years before coming to DEWSC in 1991. He has been a faculty member ever since, spending two years at Brigham Young University and the remainder of the time at DEWSC.

Bashford has served as director of the graduate program since 1997. He has also worked with Drs. Walsh and Sawhney of DEWSC to develop a collaborative research program focused upon residential construction. This has led to the development of the Arizona Partnership for Advancing Technology in Homebuilding (AzPath), a partnership with five local home builders, National Science Foundation, and the US Department of Housing and Urban Development (HUD).

Honors and Distinctions:
Bashford is also the Director of the Housing Research Institute (HRI) at ASU. Bashford also heads the Master of Real Estate Development program at DEWSC. This accelerated program is part of a university wide trans-disciplinary degree, collaborating with the schools of design, law and business at ASU.

2003 Crescodia Award for Outstanding Excellence in Environmental Education

Selected Publications:


Allan Chasey, PhD, PE
Associate Professor, PhD, Virginia Tech
achasey@asu.edu (480) 965-7437

Research Expertise: Construction process for high-technology, controlled environment facilities

Allan Chasey, an associate professor in the Del E. Webb School of Construction, received his Ph.D. from Virginia Tech, M.S. in Engineering Management from the Air Force Institute of Technology, and B.S. in Civil Engineering from ASU. He is also the Sundt Professor of Alternate Delivery and Sustainable Development.

He is Director of CREATE, a research consortium of companies representing the Advanced Technology Facility design and construction industry.

He is currently developing the Building Information Modeling (BIM) curriculum for the School of Construction.

Honors and Distinctions:
Chasey is a registered Professional Civil Engineer in Arizona, an OSHA Construction Outreach Trainer, and a LEED AP. He is a member of the American Society of Civil Engineers (ASCE), the Association for the Advancement of Cost Engineering (AACE), International Society of Pharmaceutical Engineers (ISPE), and the Semiconductor Environmental, Safety and Health Assoc. (SESHA). He also serves as the lead of the Facilities Working Group for the Factory Integration TWG for the International Technology Roadmap for Semiconductors (ITRS).

Selected Publications:


Mikhail Chester joined the School of Sustainable Engineering and the Built Environment in 2011. He has an affiliate appointment with the School of Sustainability. Previously, he was a post-doctoral researcher at the University of California, Berkeley, and guest researcher at Lawrence Berkeley National Laboratory.

Chester's research expands the assessment boundaries of complex systems to understand comprehensive effects of policies and decisions, including infrastructure interdependencies. Ultimately, he is interested in determining the external control and damage costs of these impacts and how internalization of these costs may inform behavioral economics for sustainable policies and decisions. Chester applied these research interests as a consultant for the National Research Council of the National Academies’ Hidden Costs of Energy study.

Chester’s transportation life-cycle assessment research project website with up-to-date results and in-depth methodological documentation is available at www.sustainable-transportation.com.

Honors and Distinctions:
Chester’s Environmental Assessment of Passenger Transportation Should Include Infrastructure and Supply Chains publication was recently selected as one of the journals top 3 manuscripts for 2009.

Selected Publications:
Yeganah Mashayekh, Paulina Jaramillo, Mikhail Chester, Chris Hendrickson, and Chris Weber, 2011, Costs of Automobile Air Emissions in U.S. Metropolitan Areas, Transportation Research Record, 2233, Transportation Research Board.

James Ernzen, PhD, PE
Associate Professor, PhD, University of Texas at Austin
James.ernzen@asu.edu (480) 965-0389

Research Expertise: Concrete materials and concrete production and construction operations, integrated project delivery methods

Honors and Distinctions:
In 2001 he was selected to participate on a joint FHWA-AASHTO sponsored International Scanning Tour to investigate innovative contracting methods in Europe. In 2002 he was designated as one of 75 charter Fellows of the Design Build Institute of America (DBIA). He is a member of several committees with the Transportation Research Board as well as DBIA and the American Concrete Institute. He has been recognized by American Institute of Steel Constructors, with their "Distinguished Service Award". From 2005-2009 he was director of the Del E. Webb School.

selected publications:
Peter Fox, PhD, PE  
Professor, PhD, University of Illinois  
Peter.fox@asu.edu (480) 965-1734

Research Expertise: Water reuse, biological treatment processes and brine disposal/desalination

Peter Fox has been a faculty member in Civil, Environmental and Sustainable Engineering at ASU for 20 years. He received his Ph.D. in Environmental Engineering from the University of Illinois in 1989, his M.S. in Environmental Engineering from the University of Illinois in 1985 and his B.S. in Chemical Engineering with Honors from the University of Illinois.

His professional interests are primarily in water reuse, biological treatment processes and brine disposal/desalination. He has focused his work on natural treatment systems, groundwater recharge and indirect potable water reuse for the last fifteen years.

Honors and Distinctions:
Fox served on the National Academy of Science ad-hoc committee that published the National Research Council report entitled “Prospects for Managed Underground Storage of Recoverable Water” in 2008. He also authored the groundwater recharge chapter in the Metcalf and Eddy textbook on water reuse. In addition, Fox was an executive committee member for the development of the national roadmap for desalination and water purification.

Fox was awarded the Quentin Mees Research Award from the AZWater Association in 1991, 1994, 1997 and 2003. He was awarded for his special contribution to students at Arizona State University in 1997 and 1998.

Selected Publications:

Matthew Fraser, PhD
Associate Professor, PhD, Caltech  
Matthew.fraser@asu.edu (480) 965-3489

Research Expertise: Urban air quality, sources and control of air pollution, sustainability analysis of energy systems

Matt Fraser is the Executive Director of the Quantum Energy and Sustainable Solar Technologies Engineering Research Center (QESST ERC), as well as an Associate Professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability at ASU. The QESST ERC is an interdisciplinary team consisting of multiple universities, world-renowned companies, and leading PV entrepreneurs focused on building a strategic partnership to generate innovative solutions to sustainable electricity generation. More details at www.qesst.org.

As a faculty member, Fraser directs his own research projects on urban air quality. His research focuses on using organic speciation and receptor modeling to apportion ambient pollutants to their original source. To tackle this complex problem, Fraser’s research group has been involved in field monitoring programs, source characterization studies, emission inventory preparation, and analytical method and instrument development projects. Fraser teaches courses related to energy and the environment, renewable energy, and the scientific basis for global environmental change.

Fraser received his Bachelors of Science in Chemical Engineering from Carnegie Mellon University and his Masters and Ph.D. in Environmental Engineering Science from Caltech.

Honors and Distinctions:
Presenter “University/City Partnerships in Promoting Urban Sustainability” presentation at the White House Office of Science and Technology Policy Workshop on Energy Efficiency, March 2011, Washington DC.
Panelist at the American Association for the Advancement of Science and Brookings Institute Forum on “Eco-Engineering: Building Sustainable Cities”, Washington DC, October 2011.

Selected Publications:

G. Edward (Edd) Gibson, Jr., PhD, PE, NAC
Professor and Director of the School, Sunstate Chair of Construction Management and Engineering, PhD, Auburn University  
GEEdwardGibsonJr@asu.edu (480) 965-7972

Research Expertise: Front end planning, alternative project delivery methods, risk management, dispute resolution

Edd Gibson joined ASU and the Del E. Webb School of Construction in August 2009 as its programs chair. He was named director of the School of Sustainable Engineering and the Built Environment in 2011.

Gibson has led over $9 million in funded research during his career from sponsors such as NSF, Construction Industry Institute, NRC, Alfred P. Sloan Foundation, and others. He has taught on the university level for over 20 years and has delivered more than 180 short courses to industry, receiving awards for university and continuing education instruction.

Gibson has several years of industry employment experience and is a licensed professional engineer in Texas.

Honors & Distinctions:

Selected Publications:
Rolf Halden, PhD, PE  
Professor, PhD, University of Minnesota  
halden@asu.edu (480) 727-0893

Research Expertise: Environmental biotechnology, wastewater treatment, green chemistry and public health, impact of anthropogenic activities on environmental quality and human health

Rolf Halden is Professor in SSEBE, Interim Co-Director of the Center for Health Information and Research, and Associate Director of the Swette Center for Environmental Biotechnology at ASU’s Biodesign Institute. Halden has led over $75M in funded research during his career at Lawrence Livermore National Laboratory, Johns Hopkins University and ASU, with sponsors including the NIH, EPA, DOD and DOE. He has published over 100 peer-reviewed journal articles, reports, book chapters, and patents as well as over 250 conference papers and presentations. His works include a book on contaminants of emerging concern, the first map of the human cord blood proteome, and the whole genome sequence of a dioxin-degrading bacterium. The devices he developed for groundwater monitoring and remediation have sparked two startup companies and are currently being evaluated at multiple U.S. priority (Superfund) cleanup sites.

Honors and Distinctions:  
Congressional Briefing (2011); Leroy E. Burney Lecturer, Johns Hopkins School of Public Health (2011); Biodiversity Impact Accelerator Program, Selected Startup Company, ASU (2010); Award for Research Excellence, Arizona Biotechnology Association’s BIOFEST 2010, Nominee and Finalist (2010); Invited Member of the NRC Committee of the National Academies (2006-07); Food and Drug Administration’s Nonprescription Drugs Advisory Committee (2005); Governor-appointed Maryland State Water Quality Advisory Committee Member (2003-05); Faculty Innovation Award, Johns Hopkins University (2002); Two Recognition Awards, Lawrence Livermore National Laboratory (2000).

Selected Publications:  

Keith Hjelmstad, PhD  
Professor, PhD, University of California, Berkeley  
keith.hjelmstad@asu.edu (480) 316-5988

Research Expertise: Computational mechanics, earthquake engineering, stability of structures, optimization, structural identification, nondestructive evaluation of large structures, and numerical simulation of complex structures

Keith Hjelmstad is Professor of Structural Engineering in the School of Sustainable Engineering and the Built Environment (SSEBE) in the Ira A. Fulton Schools of Engineering at Arizona State University.

Hjelmstad previously served as University Vice President and Dean of the College of Technology and Innovation at ASU. As the Dean he was responsible for the applied science and mathematics, engineering, engineering technology, cognitive science and engineering, and technological entrepreneurship and innovation management programs. As University Vice President, he served on the University leadership team of ASU and he championed further academic development of programs, activities and community relations for the Polytechnic campus.

Honors and Distinctions:  
Prior to coming to ASU Hjelmstad was on the faculty at the University of Illinois at Urbana-Champaign for 25 years where he was a professor, associate dean of academic affairs, and a member of the Science Steering Committee of the Center for Simulation of Advanced Rockets. As a professor, he was recognized for his excellence in advising and teaching.

Hjelmstad is the author of the book Fundamentals of Structural Mechanics (Springer, 2/e). He is a member of several professional associations for engineers and serves as associate editor of the Journal of Constructional Steel Research and the ASCE Journal of Structural Engineering.

Selected Publications:  

Keith Hjelmstad, PhD  
Professor, PhD, University of California, Berkeley  
keith.hjelmstad@asu.edu (480) 316-5988

Research Expertise: Computational mechanics, earthquake engineering, stability of structures, optimization, structural identification, nondestructive evaluation of large structures, and numerical simulation of complex structures

Keith Hjelmstad is Professor of Structural Engineering in the School of Sustainable Engineering and the Built Environment (SSEBE) in the Ira A. Fulton Schools of Engineering at Arizona State University.

Hjelmstad previously served as University Vice President and Dean of the College of Technology and Innovation at ASU. As the Dean he was responsible for the applied science and mathematics, engineering, engineering technology, cognitive science and engineering, and technological entrepreneurship and innovation management programs. As University Vice President, he served on the University leadership team of ASU and he championed further academic development of programs, activities and community relations for the Polytechnic campus.

Honors and Distinctions:  
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Hjelmstad is the author of the book Fundamentals of Structural Mechanics (Springer, 2/e). He is a member of several professional associations for engineers and serves as associate editor of the Journal of Constructional Steel Research and the ASCE Journal of Structural Engineering.

Selected Publications:  

Sandra Houston, PhD, PE  
Professor, PhD, University of California, Berkeley  
sandra.houston@asu.edu (480) 965-2790

Research Expertise: Advancement of methodologies for dealing with arid region problem soils, particularly collapsible and expansive soils

Sandra Houston is a long-standing member of the Civil, Environmental and Sustainable Engineering faculty at ASU and former chair of the department. Her primary area of expertise is geotechnical engineering. Houston’s contributions to the field of geotechnical engineering focus on unsaturated soils, including in particular advancement of methodologies for dealing with arid region problem soils, particularly collapsible and expansive soils. She is the regular instructor of undergraduate and graduate level foundation engineering classes and teaches a graduate level course on Unsaturated Soil Mechanics.

A heavy emphasis on the advancement of unsaturated soil mechanics into the practice of geotechnical engineering is evident by her professional service activities, research, and publications.

Honors and Distinctions:  
Houston has a long history of leadership in professional society organizations, particularly through participation in the American Society of Civil Engineers (ASCE), the Geo-Institute of ASCE, and the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE).

She is a recipient of the William H. Wisely American Civil Engineer Award, and serves as the chair of the Unsaturated Soils Committee of the Geo-Institute of ASCE, as a member of the ISSMGE Committee on Unsaturated Soils, and as chair of the ASCE Committee on Diversity and Inclusion.

Selected Publications:  


Paul C. Johnson, PhD, PE
Dean, Ira A. Fulton Schools of Engineering
Professor, School of Sustainable Engineering and the Built Environment, PhD, Princeton University
Paul.C.Johnson@asu.edu (480) 965-9235

Research Expertise: Soil and groundwater remediation and risk assessment, specifically, the design, monitoring and optimization of soil and groundwater remediation systems and the monitoring and modeling of exposure pathways

Paul Johnson is the dean of the Ira A. Fulton Schools of Engineering at Arizona State University and a professor in the School of Sustainable Engineering and the Built Environment. Johnson has been a faculty member at ASU since 1994 and has previously served as the university’s associate vice president for research, and as associate dean for research and as interim dean and executive dean for the Fulton Schools of Engineering. Prior to joining ASU, he was a senior research engineer at the Shell Oil/Shell Chemical Westhollow Technology Center in Houston, Texas.

Honors and Distinctions:
His research group recently received the 2011 Strategic Environmental Research and Development Program (SERDP) Project of the Year Award for their study of chemical vapor intrusion to homes overlying chlorinated-solvent impacted aquifers.

From 2003 through 2011, Johnson served as the editor for the National Ground Water Association’s journal, Ground Water Monitoring and Remediation. In 2011, he received the Keith E. Anderson Award from the association for outstanding contributions to the NGWA’s Scientists and Engineers division.

In 2011, Johnson was named the Outstanding Educator of the Year by the Arizona Professional Engineers Society.

Johnson is currently serving on the National Research Council Committee on Future Options of the Nation’s Subsurface Remediation Effort.

Selected Publications:

Kamil Kaloush, PhD, PE
Associate Professor, PhD, Arizona State University
Kamil.kaloush@asu.edu (480) 965-5509

Research Expertise: Pavements, materials characterization, crumb rubber applications, urban heat island

Kamil Kaloush is an associate professor in the School of Sustainable Engineering and the Built Environment, affiliate faculty in the School of Sustainability, and Director of the National Center of Excellence on SMART Innovations (www.asuSMART.com). He holds a Ph.D. degree specializing in pavements and materials from Arizona State University. He is a registered Professional Engineer, and has over 25 years of experience in pavement research and management services. His areas of expertise include pavement materials design, thermal properties, advanced laboratory testing, field performance evaluation, and pavement management systems.

Honors and Distinctions:
Kaloush is a member of several professional organizations and has over 100 publications in his field. He is the chair of the Transportation Research Board subcommittee on Pavement Materials and the Urban Climate; a member of the Civil Engineering Examination Committee, National Council of Examiners for Engineering and Surveying; Vice Chair of the Technical Advisory Board of the Rubber Pavements Association, and Advisor for the ASU-ASCE student chapter.

Kaloush is also an associate editor of the Journal of Materials in Civil Engineering. In 2009 he was the recipient of the Community Service Award presented by the joint ASU, ADOT, Industry and Local Government Pavements/Materials Conference committee.

Selected Publications:

Dean T. Kashiwagi, PhD, PE
Fulbright Professor, PhD, Arizona State University
Director, Performance Based Studies Research Group
Dean.Kashiwagi@asu.edu (480) 965-4273

Research Expertise: Supply chain best value procurement risk minimization

Dean Kashiwagi is the worldwide expert in optimizing the delivery of construction and other services using performance information. His structures/processes simultaneously minimize project/risk management functions up to 90%, increased vendor profit as much as 100%, increased performance to 98%, and decrease costs.

His Performance Information Procurement System (PIPS) and Performance Information Risk Management System (PIRMS) is licensed by the U.S. Army Medical Command and the General Services Administration. Kashiwagi has generated over $12M in grants over 18 years, and has successfully run over 975 project tests, delivering over $4.7B of construction and other services.

Honors and Distinctions:
Kashiwagi is an accomplished author with over 206 refereed conference and journal papers and is a registered engineer in eight states. His research has been recognized by the industry and recently awarded the 2011 Silver Award for Procurement Excellence by NASPO. He was the 2009 International Facility Management Association Educator of the Year. In 2005, he was the recipient of the CoreNet Global Innovation of the Year Award for the research being tested at Harvard University and in 2001 his work received the Pono Technology Award for research work and results in the State of Hawaii. Kashiwagi’s research has also expanded to Finland, Netherlands, Africa, and Malaysia.

Selected Publications:
Edward Kavazanjian, Jr., PhD, PE, GE
Professor, PhD, University of California, Berkeley
edkavy@asu.edu (480) 727-8566

Research Expertise: Geotechnical earthquake engineering, waste containment, mechanical properties of municipal solid waste

Edward Kavazanjian is a geotechnical engineer with 20 years of experience in engineering practice and 14 years of university teaching and research experience. His research and teaching interests include geotechnical earthquake engineering, analysis and design of waste containment systems, and the emerging area of biogeochemical engineering.

Honors and Distinctions:
Kavazanjian has been honored by the American Society of Civil Engineers (ASCE) with the 2011 Karl Terzaghi Award for outstanding contributions to knowledge in soil mechanics. He has also received the 2010 Thomas A. Middlebrooks award for his paper on “Shear Strength of Municipal Solid Waste” and the 2009 Ralph B. Peck Award for outstanding contributions to the geotechnical engineering profession through the publication of thoughtful, carefully researched case histories on landfill engineering from ASCE. In 2009 he was selected as Engineering Educator of the Year by the Phoenix chapter of the National Society of Professional Engineers.

Kavazanjian is co-author of the Federal Highway Administration guidance document on LRFD Seismic Design Guidance for Municipal Solid Waste Landfill Facilities. He is Past President of the Geo-Institute of ASCE and sits on the National Research Council Board of Earth Sciences and Resources, where he serves as chair of the standing Committee on Geological and Geotechnical Engineering.

Selected Publications:

Rosa Krajmalnik-Brown, PhD
Assistant Professor, PhD, Georgia Institute of Technology
Dr.Rosy@asu.edu (480) 727-7574

Research Expertise: Biotransformation and fate of environmental contaminants, bio remediation of soil, sediments, and groundwater, the use of microbial systems for bioenergy production with an emphasis on environmental applications of molecular microbial ecology

Rosa Krajmalnik-Brown is an assistant professor in Civil, Environmental & Sustainable Engineering (CESE). Before joining CESE she was a postdoctoral researcher at Biodesign working in the Center for Environmental Biotechnology. She received her B.S. (1996) in Industrial Biochemical Engineering from Autonomous Metropolitan University in Mexico City and her M.S. (2000) and Ph.D. (2005) in Environmental Engineering from Georgia Institute of Technology.

Another area of research where she applies her molecular microbial ecology expertise is the human intestinal microbial ecology and its relationship to obesity.

Her research has been published in Proceedings of the National Academy of Science, Applied and Environmental Microbiology, Environmental Science and Technology, FEMS Microbiology Ecology and Environmental Microbiology.

Honors and Distinctions:
NSF CAREER award 2011-2015
AEES Outstanding 2003 Ph.D. Candidate in Environmental Engineering
Fulbright Scholar 1997-2000
Best GPA of 1996 class “Medalla al Merito Universitario” IAM-I Mexico

Selected Publications:


Amy E. Landis, PhD
Associate Professor, PhD, University of Illinois at Chicago
Amy.Landis@asu.edu (480) 965-4028

Research Expertise: Industrial ecology, byproduct synergies, biofuels for bioremediation on marginal lands, biofuels, biopolymers, development of sustainability metrics, life cycle assessment

Amy E. Landis is an associate professor in the School of Sustainable Engineering and the Built Environment (SSEBE). Before joining SSEBE in January 2012, she was an assistant professor at the University of Pittsburgh’s Department of Civil and Environmental Engineering.

Landis is dedicated to sustainability engineering education and outreach; she works with local high schools, after school programs, local nonprofit organizations, and museums to integrate sustainability and engineering into the undergraduate curriculum, communities, and K-12 education.

Honors and Distinctions:

Selected Publications:

Amy E. Landis, PhD
Associate Professor, PhD, University of Illinois at Chicago
Amy.Landis@asu.edu (480) 965-4028

Research Expertise: Industrial ecology, byproduct synergies, biofuels for bioremediation on marginal lands, biofuels, biopolymers, development of sustainability metrics, life cycle assessment

Amy E. Landis is an associate professor in the School of Sustainable Engineering and the Built Environment (SSEBE). Before joining SSEBE in January 2012, she was an assistant professor at the University of Pittsburgh’s Department of Civil and Environmental Engineering.

Landis is dedicated to sustainability engineering education and outreach; she works with local high schools, after school programs, local nonprofit organizations, and museums to integrate sustainability and engineering into the undergraduate curriculum, communities, and K-12 education.

Honors and Distinctions:

Selected Publications:
Jason Lueke, PhD, P.Eng.
Assistant Professor, PhD, University of Alberta
Jason.Lueke@asu.edu (480) 965-7417

Research Expertise: Area of urban infrastructure management and rehabilitation, focusing on trenchless engineering and construction methodologies

Jason Lueke is an assistant professor in the Del E. Webb School of Construction (DEWSC). Prior to joining DEWSC in January 2009, he worked for 8 years as a civil infrastructure engineer in the contracting and consulting industries. He received his Ph.D. in Civil Engineering, specializing in Construction Engineering and Management, from the University of Alberta, Edmonton, in 2005. His research focuses on underground construction, buried infrastructure, and trenchless construction methods. He has published over 50 journals and conference papers in the area of trenchless design and construction.

Lueke has been involved professionally in numerous infrastructure projects including water distribution, and wastewater and storm water management; undertaking design services, feasibility studies, value engineering, risk mitigation, and tendering services; and has specialized expertise in trenchless construction methods including horizontal directional drilling, pipe relining, pipe bursting, case boring, and tunneling. Lueke is currently researching photogrammetric methods to provide quality assurance and to record as-builts; investigating behavior of buried plastic pipe installed by open trench and directional drilling beneath rivers; and researching methods to sustainably rehabilitate water distribution networks.

Honors and Distinctions:
- 2011 EPICS Gold Faculty Mentor of the Year, 2010 Trent Ralston Award from the North American Society for Trenchless Technology (NASTT) for excellence in the early stages of his career.

Selected Publications:

Michael S. Mamlouk, PhD, PE, FASCE
Professor and CESE Program Chair
PhD, Purdue University
Mamlouk@asu.edu (480) 965-2892

Research Expertise: Highway materials, pavement design and management, pavement evaluation, pavement maintenance and rehabilitation

Michael Mamlouk has over 30 years of research and teaching experience in the field of pavement/materials engineering. Prior to joining ASU, he worked at the State University of New York at Buffalo for 5 years. He received his Ph.D. degree from Purdue University in 1979. He is currently working as the Co-PI of an $840,000 project funded by the National Cooperative Highway Research Program (NCHRP) dealing with the endurance limit of hot-mix asphalt.

Honors and Distinctions:
- Mamlouk has published numerous technical papers and is actively involved in professional societies such as ASCE, AAPT, TRB and ASTM. He is the main author of the *Materials for Civil and Construction Engineers* textbook, which has been used by over 135 engineering schools worldwide. He has worked as a consultant and expert witness to many highway agencies and local industry and is a professional engineer in the State of Arizona. He received the community service award at the Arizona Pavements/Materials Conference in 2010.

Selected Publications:

Larry Mays, PhD, PE, PH, D.WRE, FASCE
Professor, PhD, University of Illinois
Mays@asu.edu (480) 965-2524

Research Expertise: Hydrosystems engineering

Larry Mays has been a professor at Arizona State University since 1989, and former chair of the department from 1989-1996. He started his academic career at the University of Texas at Austin in 1976, and became Director of the Center for Research in Water Resources in 1988.

His areas of research interest are in the study of ancient water systems and the use of optimization methods for the design and operation of water infrastructure systems to promote water resources sustainability. His research has been published in over 90 refereed journal publications, over 100 proceeding papers, over 70 chapters in books he edited and another invited 8 book chapters. He has mentored over 30 Ph.D. students.

Mays is the author, co-author, or editor-in-chief of over 22 books including the well-known textbooks Water Resources Engineering: Groundwater Hydrology; Applied Hydrology; Hydrosystems Engineering and Management; and handbooks including Water Resources Handbook; Water Distribution Systems Handbook; Hydraulic Design Handbook; and others.

Among his honors is a distinguished alumnus award from the University of Illinois at Champaign-Urbana. He is a Diplomate of the American Academy of Water Resources Engineers, a Fellow of ASCE and IWRA, and a past president of UCOWR.

Selected Publications:
- Ground and Surface Water Hydrology, John Wiley and Sons, Inc., Copyright 2012.
Barzin Mobasher, PhD, PE  
Professor, PhD, Northwestern University  
Barzin@asu.edu (480) 965-0141

Research Expertise: Mechanics of composite materials, development of new construction materials, durability of building materials, and performance based specifications

Barzin Mobasher, who joined the Ira A. Fulton Schools of Engineering faculty in 1991, has been involved in research and teaching in the area of cement and concrete engineering for more than 25 years. He received his Ph.D. in 1990 from Northwestern University. His specific expertise is in the mechanics of composite materials, the development of new construction materials and the durability of building materials.

Mobasher has published more than 150 peer-reviewed research papers on the mechanics and durability of concrete technology, and has delivered more than 120 technical presentations worldwide.

Honors and Distinctions:
In 2009 Mobasher was selected as a Fellow of the American Concrete Institute (ACI), one of the most prominent organizations in the concrete technology field.

He is a member of the American Society of Civil Engineers (ASCE) and American Ceramic Society and member of the International Editorial Board of Computers and Concrete.


His paper titled: Mechanical behaviour of strain-hardening cement-based composites (SHCC) under low and high tensile strain rates was selected among the top three papers in 2011 by the Japan Concrete Institute.

Selected Publications:


Narayanan Neithalath, PhD.  
Associate Professor, PhD, Purdue University  
Narayanan.Neithalath@asu.edu (480) 965-6023

Research Expertise: Sustainable construction materials including high volume cement replacement materials for concrete, development of novel materials for desired performance levels such as pervious concretes, cement-free binder systems and lightweight aggregate concretes, and fundamental aspects of property development in conventional and novel cementitious (and cement-less or alkali activated) systems

Narayanan Neithalath is an Associate Professor in the School of Sustainable Engineering and the Built Environment at Arizona State University. He received his PhD in Civil Engineering (specializing in Concrete Materials) from Purdue University in 2004.

He is also interested in transport properties of concretes, electrical impedance sensing and sensor systems for concrete, and non-invasive and non-destructive testing of concrete. He has published around 100 papers in peer reviewed journals and conference proceedings, and has received several awards for his work on novel concrete materials including the NSF CAREER award, Bengt Friberg award for outstanding paper, and PCA fellowship. (http://faculty.engineering.asu.edu/neithalath)

Honors and Distinctions:
NSF CAREER Award (2008)
Bengt Friberg Award (2006) for the Best Paper by a Young Author – 8th International Conference on Concrete Pavements, Colorado Springs, CO, Portland Cement Association (PCA) Fellowship (2003) for research on Enhanced Porosity Concrete systems
Associate Editor – Journal of Materials in Civil Engineering
Member of the editorial board of Cement and Concrete Composites

Selected Publications:


Ram Pendyala, PhD.  
Professor, PhD, University of California, Davis  
ram.pendyala@asu.edu (480) 727-9164

Research Expertise: Development and application of new methods for modeling and forecasting transportation demand and system performance under a wide variety of socio-economic, modal, and land use scenarios

Ram Pendyala joined ASU in 2006 after spending 12 years on the faculty at the University of South Florida. He received his Ph.D. from the University of California at Davis in 1992.

Pendyala teaches courses in transportation engineering, transportation systems analysis and modeling, and public transportation planning and design. He has conducted more than $5 million in sponsored research over the past 20 years for a variety of agencies including Federal Highway Administration, National Science Foundation, Florida Department of Transportation, Maricopa Association of Governments, Southern California Association of Governments, and Baltimore Metropolitan Council.

Honors and Distinctions:
Pendyala is currently Chair of the Transportation Research Board’s Travel Analysis Methods Section, and Chair of the International Association for Travel Behavior Research. He has published more than 100 articles in refereed journals, books, and conference proceedings. Pendyala has mentored over 50 M.S. and Ph.D. students.

Selected Publications:


Subramaniam (Subby) Rajan, PhD, PE
Professor and SSEBE Graduate Chair, PhD, University of Iowa
S.Rajan@asu.edu (480) 965-1712

Research Expertise: Finite element based design optimization, parallel computations, constitutive material modeling

Subby Rajan’s teaching and research interests include solid mechanics with emphasis on constitutive modeling, finite element analysis, design optimization and high-performance software development. Currently he is working on research projects sponsored by the Federal Aviation Administration (FAA), the Army Research Office (ARO) and local industries. These projects involve characterization of materials for blast and ballistic mitigation, development of constitutive models and computer simulations, and design optimization to reduce the weight, thickness and cost of body, vehicle and aircraft armor.

Honors and Distinctions:
Rajan’s awards include Outstanding Engineering Educator of the Year awarded during Greater Phoenix Area Engineer’s Week and Top Five Percent Faculty Award from Ira A. Fulton Schools of Engineering. He is a member of the Educator Advisory Board for the Kno Corporation, Board member for the Resource Center for Global Ecohappiness and Faculty Expert for the Indo-US Collaboration for Engineering Education.

Selected Publications:

Bruce Rittmann, PhD, NAE
 Regents’ Professor, PhD, Stanford University Director, Swette Center for Environmental Biotechnology
Rittmann@asu.edu (480) 727-0434

Research Expertise: Environmental biotechnology, or managing microorganisms to provide services to society

The services include bioremediating pollution of water and soil, and generating renewable bioenergy. This highly inter-disciplinary research links engineering fundamentals with microbial ecology, biochemistry, genetics, geochemistry, and materials.

Honors and Distinctions:
Rittmann’s awards include membership in the National Academy of Engineering (NAE), a Fellow of the AAAS and the IWA, the Huber and Freese Awards from the ASCE, and appointment as a Regents’ Professor at ASU. He has more than 490 publications and is on the ISI’s List of Most Highly Cited Researchers. Distinguished Member of ASCE.

Selected Publications:

Thomas P. Seager, PhD
Associate Professor, PhD, Clarkson University
thomas.seager@asu.edu (480) 727-0531

Research Expertise: Ultra-low energy community infrastructure, ethics education and life-cycle environmental implications of single-walled carbon nanotubes in energy applications

Tom Seager joined the School of Sustainable Engineering and the Built Environment in August 2010. Seager is formerly a founding faculty member at the Golisano Institute for Sustainability at Rochester Institute of Technology and led development of their PhD curriculum in sustainability.

He works at the leading edge of an integrative, transdisciplinary approach to engineering education and research and is currently leading projects related to ultra-low energy community infrastructure, ethics education for science and engineering graduate students, and the life-cycle environmental implications of single walled carbon nanotubes in energy applications.

Selected Publications:
Enrique R. Vivoni, PhD, PE
Associate Professor, PhD, Massachusetts Institute of Technology
vivoni@asu.edu (480) 965-5228

Research Expertise: Watershed hydrology and its linkages with ecological, atmospheric and geomorphologic processes

Enrique Vivoni is well known for his research in watershed hydrology and its linkages with ecological, atmospheric and geomorphologic processes. As a surface hydrologist, he performs research in hydrometeorology, ecohydrology, geomorphology and surface-groundwater interactions. His teaching is centered on surface hydrology and techniques for numerical and field studies.

Honors and Distinctions:
Vivoni is the recipient of several awards including the Presidential Early Career Award for Scientists and Engineers (2008), the U.S. Fulbright-Garcia Robles Scholarship (2009) and the Kavli Science Fellowship (2010). He is an active member of the American Geophysical Union, American Society of Civil Engineers and American Meteorological Society.

Selected Publications:

Zhihua Wang, PhD
Assistant Professor, PhD, Princeton University zhwang@asu.edu (480) 727-9592

Research Expertise: Urban environment under the changing climate, including land-atmosphere interactions, subsurface heat/water transport, mitigation of urban heat island effect and the long-term sustainability of cities

Zhihua Wang is originally from Zhejiang Province of China. He spent 9 years (1997-2006) in Singapore, a small beautiful tropical island in Southeast Asia, completed his Bachelor’s & Master’s degrees and later worked as a researcher in Nanyang Technological University. Prior to joining ASU, he worked with Prof. Elie Bou-Zeid and Prof. Jim Smith in Environmental Engineering and Water Research (EEWR) program in Princeton University.

Honors and Distinctions:
Wang is an active member of the American Meteorological Society (AMS), American Physical Society (APS), American Geophysical Union (AGU) and International Association for Urban Climate (IAUC). As a passionate and highly-motivated researcher, he has been highly productive and published more than 20 peer-reviewed papers in high impact journals and conference proceedings.

Selected Publications:
Paul Westerhoff, PhD, PE
Professor, SSEBE, Associate Dean of Research, IAFSE, PhD, University of Colorado
pwesterson@asu.edu (480) 965-2885

Research Expertise: Treatment and occurrence of emerging contaminants in water

Paul Westerhoff has a strong publication and research record, has garnered wide recognition for his work related to treatment and occurrence of emerging contaminants in water, and has been active in multidisciplinary research. He has lead research funded by AWWARF, USEPA, NIH, NSF and local organizations investigating reactions and fate of oxidants (bromate, nitrate, nitrite, sulfate) during water treatment, characterization, treatment and oxidation of natural organic matter in watersheds, formation of disinfection by-products, removal of taste and odor micropollutants and fate of nanomaterials in water. He has over 120 peer reviewed journal article publications and has been involved in over 250 conference presentations. He belongs to ASCE, AWWA, AEESEP, ACS, IOA, IWA, APWPA, and IHSS and serves on numerous voluntary committees for these organizations.

Honors and Distinctions:
Westerhoff has received several research awards including the 2005 ASCE Walter L. Huber Research Award and the 2006 WEF Paul L. Busch Award. He currently serves on the USEPA Science Advisory Board (Environmental Engineering Committee) and is Vice Chair of the WaterReuse Research Foundation Research Advisory Board.

Selected Publications:

Avi Wiezol, PhD, PE
Associate Professor and DEWSC Interim Chair
PhD, Technion-Israel Institute of Technology
aviwiesel@asu.edu (480) 965-4121

Research Expertise: Leadership in construction management, buildability modeling, construction education

A faculty member of ASU since 1995, Avi Wiezol holds a M.Sc degree in structural engineering and a M.Sc and Ph.D in building science.
Prior to becoming a professor, Wiezol held several managerial positions with construction and engineering firms in Europe and the Middle East. His activities resulted in continuous productivity improvements averaging 15% per year for the units in which he was in charge. Wiezol taught in four languages on three continents (Asia, Europe, and America) to students of all levels, ranging from vocational education to doctoral students.
Wiezol is a true interdisciplinary researcher, with interests ranging from computer modeling of human skills in construction, to engineering education, and leadership. He served as the President of the Faculty Senate in the School of Engineering and as the Chair of the Education Committee of the Technical Council on Computers and Information Technology (TCCIT) in the American Society of Civil Engineers (ASCE).

Honors and Distinctions:
Wiezol ranks among the top 5% of best teachers in the Ira A. Fulton Schools of Engineering and is the recipient of the Outstanding Faculty Member Award. He serves as the Coordinator of Construction Graduate Studies and the Interim Chairman of the Del E. Webb School of Construction Management Programs.

Selected Publications:

Claudia E. Zapata, PhD
Assistant Professor, PhD, Arizona State University
claudia.zapata@asu.edu (480) 727-8514

Research Expertise: Characterization and modeling of fluid flow and volume change behavior of unsaturated soils and lab/field instrumentation

Claudia Zapata received her PhD from Arizona State University in 1999. She has particularly focused on the characterization of problem soils; applications related to the behavior of pavement subgrades due to dynamic loading and environmental conditions; and the assessment of fluid flow and volume change of soils under slabs-on-ground residential foundation systems.
Zapata is currently working on three main research projects: The implementation of the Mechanistic-Empirical Pavement Design Guide for the Maricopa Department of Transportation; the study of cracked expansive clays for the National Science Foundation; and the development of an Atlas of unsaturated soil properties for the 50 states for the National Cooperative Highway Research Program.

Honors and Distinctions:
Zapata is the author of 20 technical publications focusing on expansive soils, unsaturated soil properties predicting models, and environmental effects on pavement design. She was featured in the May/June 2009 ASCE Geotechnical Engineering magazine, Geo-Strata, as a co-author of the article entitled “Application of Unsaturated Soil Mechanics to Pavement Subgrade Design.”

Selected Publications:
Absar Alum, PhD
University of Arizona
Assistant Professor Research, Civil, Environmental & Sustainable Engineering
alum@asu.edu (480) 965-6268

Expertise: Health related environmental microbiology, microbial pathogen survival and detection, and endocrine disrupting chemicals in water

Thomas Attard, PhD
Arizona State University
Associate Research Professor
Tom.attard@asu.edu (480) 965-5623

Expertise: Seismic retrofit of already damaged structures using “CarbonFlex” which is a new patent-protected strength-sustainable composite that stabilizes crack growth in damaged substrates using an energy-dissipating mechanism

Paul Dahlen, PhD
Arizona State University
Assistant Research Professor, Part-time appointment in Civil, Environmental & Sustainable Engineering
Paul.Dahlen@asu.edu (480) 965-0055

Expertise: Assessment and remediation of hydrocarbon impacts to soil/groundwater

Hong Luo, PhD
Arizona State University
Assistant Research Professor, Civil, Environmental & Sustainable Engineering
Hong.Luo@asu.edu (480) 965-0055

Expertise: Contaminant fate and transport in the subsurface with a focus on vapor intrusion

Della M. Roy, PhD, NAE, WAC
Research Professor, part-time joint appointment in the School of Sustainable Engineering and the Built Environment and the School of Mechanical, Aerospace, Chemical and Materials Engineering
Della.Roy@asu.edu (818) 865-1196

Roy is also a Professor Emerita of Materials Science at The Pennsylvania State University.

Expertise: Cementitious materials, chemically bonded ceramics, biomaterials research and radioactive waste management

Thomas Schleifer, PhD
Arizona State University
Assistant Research Professor, Del E. Webb School of Construction
Thomas.schleifer@asu.edu (480) 965-3740

Expertise: Construction management

CIM student Greg Carbajal (graduated spring 2011) and instructor Edwin Weaver mixing concrete in a CreteSheet in the concrete laboratory.
Aaron Cohen, MS
DePaul University
Aaron.cohen@asu.edu  (480) 965-6628

Associated General Contractors (AGC) Lecturer
Teaching focuses on courses in the heavy/civil concentration for the DEWSC Construction Management degree program.

Kraig Knutson, PhD
Arizona State University
Kraig.knutson@asu.edu (480) 965-1402

Senior lecturer in the DEWSC program
Teaching and research include historical construction methods, infrastructure security and application of industrial engineering techniques to construction processes.

Christopher Lawrence, PhD
Arizona State University
Chris.lawrence@asu.edu (480) 965-2893

Teaching areas include engineering mechanics, civil engineering materials, geotechnical engineering, and civil engineering project management. Lecturer in CESE and DEWSC programs. Research and engineering focus on unsaturated soils theory and the design, development and fabrication of advanced soil testing systems.

Brooke Mayer, PhD, PE
Arizona State University
Brooke.mayer@asu.edu (480) 965-0598

Lecturer in CESE teaches Unit Operations in Environmental Engineering, Introduction to Technology, Society, and Sustainability, Global Engineering, Statics, Numerical Methods and Introduction to Environmental Engineering.
Research related to the removal and inactivation of microbial pathogens from drinking water.

Edwin C. Weaver, PE
Arizona State University
Edwin.weaver@asu.edu (480) 965-8366

Senior Lecturer in DEWSC teaches and develops graduate and undergraduate courses in the Concrete Industry Management and Construction Management degree programs.
Research areas of interest include contracts and specifications for concrete construction, concrete paving for airfields and roadways and safety during concrete and masonry construction operations.

SSEBE Adjunct/Affiliate Faculty and Faculty Associates

Christopher Aulerich, Faculty Associate, Construction
Duane Church, Faculty Associate, Construction
Edward Fancher, Faculty Associate, Construction
Mark Felder, Faculty Associate, Construction
Danielle Feroletto, Faculty Associate, Construction
Michael Gilchrist, Faculty Associate, Construction
Samuel Hanna, Faculty Associate, Civil, Environmental & Sustainable
Jeff King, Faculty Associate, Construction
Patrick Okamura, Faculty Associate, Construction
Eric Petrie, Faculty Associate, Construction
Matthew Pierce, Faculty Associate, Construction
Martin Ramirez, Faculty Associate, Construction
Kenneth Ricker, Faculty Associate, Construction
James Rogers, Faculty Associate, Construction
David Sabers, Faculty Associate, Civil, Environmental & Sustainable
Clifford Schexnayder, Faculty Associate, Construction
Michael Smith, Faculty Associate, Construction
William Smith, Professor of Practice, Construction
Scott Thomas, Faculty Associate, Construction
William Washburn, Faculty Associate, Construction
James Willson, Faculty Associate, Construction
Clinton Wilkins, Faculty Associate, Construction