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Sustainable Technology and the Built Environment
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ACADEMIC APPOINTMENTS

- 2016-Present **Appalachian State University**, Boone, North Carolina, USA
Dept. Assistant Chair + Associate Professor
- 2010-2016 **Appalachian State University**, Boone, North Carolina, USA
Assistant Professor, Building Science Program
- 2009-2010 **Texas A&M University**, College Station, Texas, USA
Postdoctoral Research Associate, Zachary Department of Civil Engineering

EDUCATION

- 2006-2009 **Texas A&M University**, College Station, Texas, USA
Ph.D., Zachry Department of Civil Engineering, May 2009
Dissertation: "Systems Approach and Quantitative Decision Tools for Technology Selection in Environmentally Friendly Drilling"
Advisors: Jean-Louis Briaud (Chair), Seth D. Guikema, David Burnett, and Roy Hann
- 2003-2005 **Texas A&M University**, College Station, Texas, USA
M.S., Department of Construction Science, December 2005
Area: Construction Management / Building Information Modelling (BIM)
Advisor: Dr. Julian H. Kang
- 1992-1999 **KonKuk University**, Seoul, Korea
B.S., Department of Civil Engineering, February 1999

RESEARCH / TEACHING INTERESTS

- Renewable Energy System Development:
 - Integrated biomass greenhouse heating system.
 - Biochar as a soil amendment.
 - Real-time monitoring and controlling system using micro-controllers (automation).
- Infrastructure Sustainability:
 - Remote structural health monitoring, Natural hazard mitigation (i.e., Early warning systems).
- Building Information Modeling:
 - Building energy (e.g., IESVE, eQUEST), Construction visualization (4D CAD).
- Risk and Decision Analysis for Project Management:

- Project risk management, Bayesian probability, Forecasting, Optimal modeling, Data regression.
- Life cycle assessment and cost benefit analysis in the built environment.

FUNDED RESEARCH EXPERIENCES

(Total Amount = \$665,837; PI = \$319,280, Co-PI = \$346,557)

- 2017-2018 **Demonstrating Syngas Production from BioEnergy Crops**
Co-Principal Investigator, Appalachian State University
Sponsor: Bioenergy Research Initiative Program, NC Department of Agriculture and Consumer Services (\$97,231 awarded)
Investigators: Ferrell, J. (PI), Houser, J., Hambourger, M., and Kim, H.
- 2016-2017 **Promoting Biomass Greenhouse Heating Systems**
Principal Investigator, Appalachian State University
[\[http://ok.tec.appstate.edu/biomass\]](http://ok.tec.appstate.edu/biomass)
 - Implemented biomass heating technologies to cooperative farms.Sponsor: Bioenergy Research Initiative Program, NC Department of Agriculture and Consumer Services (\$85,343 awarded)
Investigators: Ferrell, J. and Kim, H.
- 2016 **CONCERT Grant**
Principal Investigator, Appalachian State University
 - Conducted combustion and emission analysis for a biochar-maker at Nexus.Sponsor: Research Institute for Environment, Energy and Economics, Appalachian State University (\$ 4,328 awarded)
Investigators: Ferrell, J. and Kim, H.
- 2015-2017 **P3 Awards: Integration of Biomass Greenhouse Heating Systems**
Principal Investigator, Appalachian State University
 - Integrated heating technologies into greenhouse heating system.Sponsor: Environmental Protection Agency (Phase II, \$74,553 awarded)
Investigators: Ferrell, J., Domermuth, D., Houser, J., and Oh, S.
- 2015-2016 **Biomass Greenhouse Heating Systems for Resource-Limited Farmers**
Principal Investigator, Appalachian State University
 - Developed and refined biomass greenhouse heating systems (Nexus).Sponsor: Bioenergy Research Initiative Program, NC Department of Agriculture and Consumer Services (\$83,150 awarded)
Investigators: Domermuth, D. and Houser, J.
- 2014-2016 **Graduate Research Associate Mentoring Award**
Principal Investigator, Appalachian State University
 - Installed energy monitoring devices to the Watauga County Jail, NC to predict facility energy consumption and to refine energy modelling tools.Sponsor: Appalachian State University (\$24,000 awarded)
Investigators: Holcomb, J. and Tiller, J.

- 2013-2015 **IDEXlab: Integrative Design Experience Laboratory (TUES Grant)**
Co-Principal Investigator, Appalachian State University
- Developed project-based integrative Design Experience Laboratory (IDEXlab).
- Sponsor: National Science Foundation (\$199,741 awarded)
Investigators: Everhart, C. (PI), Russell, J., Debelius, C., and Ramsdell, J.
- 2015 **Greening North Carolina's Jail System**
Principal Investigator, Appalachian State University
- Installed an energy monitoring system to the Caldwell County Jail, NC to predict facility energy consumption.
- Sponsor: Appalachian Energy Center (\$4,000 awarded)
Investigators: Holcomb, J. and Tiller, J.
- 2015 **Real-time Landfill Gas Monitoring System**
Co-Principal Investigator, Appalachian State University
- Developed and installed a remote landfill gas monitoring system using Modbus TCP/IP protocol at Wilkes County Landfill, NC.
- Sponsor: Appalachian Energy Center (\$3,000 awarded)
Investigators: Raichle B. (PI) and Peralion, J.
- 2014-2015 **P3 Awards: A National Student Design Competition for Sustainability for Focusing on People, Prosperity and the Planet**
Principal Investigator, Appalachian State University
- Developed biomass greenhouse heating systems to extend growing seasons.
- Sponsor: Environmental Protection Agency (Phase I, \$14,806 awarded)
Investigators: Domermuth, D. and Houser, J.
- 2014 **Biomass Manufacturing Facility Development**
Principal Investigator, Appalachian State University
- Conducted a research regarding the business potential of new development of a bio-burner.
- Sponsor: Mitchell County Economic Development Commission (\$5,000 awarded)
Investigators: Domermuth, D. and McCurry, C.
- 2013-2014 **Implementation of the ASU BV System to Convert Biomass to Useful Products and Biofuel**
Co-Principal Investigator, Appalachian State University
- Developed and implemented the ASU BV system.
- Sponsor: TVA Ag & Forestry Fund, NC Department of Agriculture and Consumer Services (\$45,000 awarded)
Investigators: Domermuth, D. (PI)
- 2013 **Greening North Carolina's Jail System**
Principal Investigator, Appalachian State University
- Installed an energy monitoring system to the Watauga County Jail, NC.
- Sponsor: Appalachian Energy Center (\$2,100 awarded)
Investigators: Holcomb, J. and Russell, J.

- 2012-2013 **Greening NC's Prison System: An Interdisciplinary Investigation**
Co-Principal Investigator, Appalachian State University
- Developed a decision making tool to support optimized capital investment in sustainable project planning.
- Sponsor: University Research Council, Appalachian State Univ. (\$1,585 awarded)
Investigators: Holcomb, J. (PI) and Russell, J.
- 2012-2013 **Real-time Monitoring of Landfill Gas Using Remote Monitoring Technology**
Principal Investigator, Appalachian State University
[\[http://ok.tec.appstate.edu/landfill\]](http://ok.tec.appstate.edu/landfill)
- Developed a landfill gas monitoring and controlling unit.
- Sponsor: University Research Council / Department of Technology and Environmental Design, Appalachian State University (\$11,500 awarded)
- 2010-2012 **Real-time Structural Health Monitoring System for Buildings**
Principal Investigator, Appalachian State University
[\[http://ok.tec.appstate.edu/structure\]](http://ok.tec.appstate.edu/structure)
- Developed a web-based real-time building health monitoring system.
- Sponsor: Department of Technology and Environmental Design, Appalachian State University (\$10,500 awarded)
- 2009-2010 **Environmentally Friendly Drilling (EFD) Systems (Phase II)**
Post-Doctoral Research Associate, Texas A&M University
[\[http://stochasticgeomechanics.civil.tamu.edu/efd\]](http://stochasticgeomechanics.civil.tamu.edu/efd)
- Developed a Web-Based Decision Optimization Tool (Causal approach) for system selection in EFD.
- Sponsor: Research Partnership to Secure Energy for America (\$2,700,000 awarded)
Investigators: Haut, R. (PI), Burnett, D., and Medina-Cetina, Z.
- 2009-2010 **Real-time Monitoring of Scour Events Using Remote Monitoring Technology**
Post-Doctoral Research Associate, Texas A&M University
- Developed a Web-Based Bridge Scour Monitoring System.
- Sponsor: Texas Department of Transportation (\$375,733 awarded)
Investigators: Briaud, J.-L. (PI), Hurlebaus, S., and Chang, K.
- 2006-2009 **Environmentally Friendly Drilling (EFD) Systems (Phase I)**
Research Assistant, Texas A&M University
- Designed deep foundations with elevated platform for onshore EFD and performed a parametric study for the feasibility of using composite mats.
- Sponsor: U.S. Department of Energy (\$2,400,000 awarded)
Investigators: Haut, R. (PI), Burnett, D., and Briaud, J.-L.
- 2004-2005 **Web-Based Bridge Design Support System (WBDSS)**
Research Assistant, Texas A&M University

- Developed a Web-Based Bridge Design Support System and evaluated its commercial potential.

Sponsor: Ministry of Construction and Transportation of the Korean Government
(\$450,000 awarded)

Investigators: Lho, B. (PI) and Kang, J.

PROFESSIONAL INDUSTRY EXPERIENCES

- 2000-2003 **Daehan Consultants Co., Ltd.**, Seoul, Korea
Bridge and Tunnel Design Engineer, Structural Division
- Performed numerical analysis (2D, 3D) for "Jookryung Tunnel Master Plan & Layout" project: Jookryung Tunnel is one of the longest road tunnels in Korea (4.5 km).
 - Performed static and dynamic structural analysis of tunnels for "Jeonju~Hamyang Highway (Sect.10)" project.
 - Performed numerical analysis (2D, 3D) for "Gumga Bridge Alternative Design Competition" project: steel arch bridge (800 m).
- 1998-2000 **Dongshin Engineering & Development Co., Ltd.**, Seoul, Korea
Structural Engineer, Structural Division
- Performed static structural analysis of bridges, generated drawings using AutoCAD, and prepared engineering reports including estimated bill of quantities for "Hampyung~Hampyung I.C. Extension & Paving Layout" project.

MILITARY SERVICE

1993-1996 *Sergeant*, **Ministry of National Defense**, Seoul, Korea

LICENSES AND CERTIFICATES

- **Professional Engineer** (No. 041698), North Carolina, 2014.
- **Professional Engineer** (No. 105221), Texas, 2009 (surrendered).
- Certificate In Business, Mays Business School, Texas A&M University, 2008.
- Engineer-In-Training (EIT), Texas, 2007.
- EIT, Korea, 1998.
- Construction Safety Certificate, Korea, 1998.

HONORS AND AWARDS

- Outstanding Scholarship/Creative Activity Award, Appalachian State University, 2016
- The U.S. Environmental Protection Agency P3 Award, 2015
- Korean American Scholarship Foundation Award, 2008.
- Korean Honor Scholarship, 2008.
- Oscar T. Trevino Endowed Scholarship, 2005.
- Construction Industry Advisory Council Scholarship, 2004.
- Excellent Research Proposal Award, 2004.
- O.N. Mitchell, Junior, Endowed Graduate Fellowship, 2003.
- Academic Excellence Scholarship, 1997 and 1998.

- Merit Scholarship, 1992.

PROFESSIONAL AFFILIATIONS

- Member, International Biochar Initiative
- Member, North Carolina Board of Professional Engineers
- Expert Member, The Global Network of Korean Scientists & Engineers (KOSEN)
- Member, Korean-American Scientists and Engineer Association (KSEA)
- Member, American Society of Civil Engineers (ASCE)
- Member, Institute for Operations Research and the Management Sciences (INFORMS)

PUBLICATIONS (* denotes a student)

[Refereed Journal Articles]

1. **Yu, O.-Y.**, Harper, M.*, Hoepfl, M., Domermuth, D. (2017). "[Characterization of Biochar and its Effects on the Water Holding Capacity of Loamy Sand Soil: Comparison of Hemlock Biochar and Switchblade grass Biochar Characteristics](#)," *Environmental Progress and Sustainable Energy*, 36 (No. 5), pp. 1474-1479.
2. **Yu, O.-Y.** and Moore, S.* (2015). "[A Case Study for the Effectiveness of Solar Powered Attic Ventilation Fans](#)," *Energy Efficiency*, 8 (No. 4), pp. 691-698.
3. **Yu, O.-Y.**, Raichle, B., and Sink, S.* (2013). "[Impact of Biochar on the Water Holding Capacity of Loamy Sand Soil](#)," *International Journal of Energy and Environmental Engineering*, 4:44.
4. **Yu, O.-Y.**, Guikema, S., Briaud, J.-L., and Burnett, D. (2012). "[Sensitivity Analysis for Multi-Attribute System Selection in Onshore Environmentally Friendly Drilling \(EFD\)](#)," *Systems Engineering*, 15 (No. 2), pp. 153-171.
5. **Yu, O.-Y.**, Medina-Cetina, Z., Guikema, S., Briaud, J.-L., and Burnett, D. (2012). "[Integrated Approach for the Optimal Selection of Environmentally Friendly Drilling Systems](#)," *International Journal of Energy and Environmental Engineering*, 3:25.
6. **Yu, O.-Y.**, Guikema, S., Briaud, J.-L., and Burnett, D. (2011). "[Quantitative Decision Tools for System Selection in Environmentally Friendly Drilling](#)," *Civil Engineering and Environmental Systems*, 28 (No. 3), pp. 185-208.
7. Kang, J., Lho, B., Kim, J., and **Yu, O.-Y.** "Design Automation and Sustainable Drawing Management on the Web using ASP, XML and SVG," *Journal of Computing in Civil Engineering*, ASCE (accepted as technical note).

[Peer-Reviewed Conference Papers]

1. **Yu, O.-Y.**, Roxby, E.*, Tiller, J., and Holcomb, J. (2015). "Energy Modeling for Jails and Detention Facilities," *2015 ASHRAE Annual Conference (#AT-15-C011)*, Atlanta, GA, USA.
2. Kim, H.*, **Yu, O.-Y.**, Hoyle, J., Houser, J., Ramsdell, J., and Hoepfl, M. (2014). "Decision-Making in the Selection of Food Waste Diversion Systems by Life Cycle Assessment and Cost Benefit Analysis," *The Fourth Annual Asian Conference on Sustainability, Energy and the Environment (#0089)*, Osaka, Japan.
3. Domermuth, D., **Yu, O.-Y.**, Houser, J., Smith, A.*, and Harper, M.* (2014). "Nexus," *American Society for Engineering Education Southeast Section Conference*, Macon, GA, USA.

4. **Yu, O.-Y.** and Moore, S.* (2013). "Real-time Structural Health Monitoring of Live Loads on a Flat Commercial Roof," *SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring (#8695-8)*, San Diego, CA, USA.
5. **Yu, O.-Y.** and Medina-Cetina, Z. (2012). "Best Selection of Oil and Gas Environmentally Friendly Drilling Systems Using Bayesian Decision Networks," *Rina Conference, ICSOT: Developments in Fixed & Floating Offshore Structures*, Pusan, Korea.
6. **Yu, O.-Y.**, Medina-Cetina, Z., and Briaud, J.-L. (2011). "Towards an Uncertainty-Based Design of Foundations for Onshore Oil and Gas Environmentally Friendly Drilling (EFD) Systems," *Geo-Frontiers 2011 (#1751)*, Dallas, TX, USA.
7. Al-Yami, A.*, Schubert, J., Medina-Cetina, Z., and **Yu, O.-Y.** (2010). "Development of Drilling Expert System for Designing and Applying Successful Cement Jobs," *IADC/SPE Asia Pacific Drilling Technology Conference and Exhibition (IADC/SPE 135183)*, Ho Chi Minh City, Vietnam.
8. Yao, C., Darby, C., **Yu, O.-Y.**, Briaud, J.-L. et al. (2010). "Scour Monitoring Development for Two Bridges in Texas," *International Conference on Scour and Erosion (ICSE)*, San Francisco, CA, USA.
9. Briaud, J.-L., Yao, C., Darby, C., **Yu, O.-Y.** et al. (2010). "Motion Sensors for Scour Monitoring: Laboratory Experiments and Numerical Simulations," *Transportation Research Board (TRB) 89th Annual Meeting*, Washington, D.C., USA.
10. **Yu, O.-Y.**, Medina-Cetina, Z., Briaud, J.-L., and Burnett, D. (2009). "Towards a Causal Probabilistic System Selection in Environmentally Friendly Drilling," *16th International Petroleum and Biofuels Environmental Conference*, Houston, TX, USA.
11. **Yu, O.-Y.**, Guikema, S., Bickel, E., Briaud, J.-L., and Burnett, D. (2009). "Systems Approach and Quantitative Decision Tools for Technology Selection in Environmentally Friendly Drilling," *SPE Americas E&P Environmental & Safety Conference (SPE 120848)*, San Antonio, TX, USA.
12. Burnett, D., **Yu, O.-Y.**, and Schubert, J. (2009). "Well Design for Environmentally Friendly Drilling System: Using a Graduate Student Drilling Class Team Challenge to Identify Options for Reducing Impacts," *SPE/IADC Conference and Exhibition (SPE/IADC 119297)*, Amsterdam, The Netherlands.
13. Yao, C., Darby, C., **Yu, O.-Y.**, Briaud, J.-L. et al. (2009). "Motion Sensors for Scour Monitoring: Laboratory Experiment with a Shallow Foundation," *GeoFlorida 2010*, West Palm Beach, FL, USA.
14. Darby, C., Yao, C., **Yu, O.-Y.**, Briaud, J.-L. et al. (2009). "Motion Sensors for Bridge Scour Monitoring: Preliminary laboratory and Field Experience," *Texas Section-American Society of Civil Engineers*, The Woodlands, TX, USA.
15. Lho, B., Kim, J., **Yu, O.-Y.**, and Kang, J. (2005). "Sustainable Design Automation and Management Using XML," *The 1st International Conference on Construction Engineering and Management (ICCEM)*, Seoul, Korea.

[Technical Reports]

1. Briaud, J.-L., **Yu, O.-Y.** et al. (2011). "Real-time Monitoring of Bridge Scour Using Remote Monitoring Technology (Report 0-6060-1)," *Real-time Monitoring of Scour Event Using Remote Monitoring Technology Project*, Texas Department of Transportation.

2. **Yu, O.-Y.**, Briaud, J.-L. et al. (2007). "Environmentally Friendly Foundation System for Onshore Oil and Gas Drilling Platform," *Environmentally Friendly Drilling Systems Project*, GPRI.
3. **Yu, O.-Y.** (2005). "The Four Dimensional Visualization Tool for Developing Construction Schedule of a Typical Residential House in the United States," *Mitchell Fellowship Report*, Department of Construction Science, Texas A&M University.

INVITED LECTURES

1. "Biomass Greenhouse Heating System, Nexus," *Department of Electrical Engineering, Chien Hsin University of Science and Technology*, Taoyuan, Taiwan, 20 May 2015.
2. "Introduction of Real-time Monitoring Research," *Department of Civil Engineering, Gangneung-Wonju National University*, Gangneung, Korea, 5 June 2012.
3. "What are Decision Tools for Technology Selection in Environmentally Friendly Drilling?," *School of Civil & Environmental Engineering, Pusan National University*, Pusan, Korea, 22 May 2012.

CONFERENCE PRESENTATIONS

1. "The Effects of Biochar as a Soil Amendment on Soil Quality and Plant Growth: A Study for the North Carolina High County," *Biochar: Production, Characterization and Applications, Engineering Conferences International*, Alba, Italy, 24 August 2017.
2. "Characteristics Comparison of Two Different Types of biochar obtained from a Small-scale Biochar Production System," *Asia Pacific Biochar Conference 2016*, Chuncheon, Korea, 22 October 2016.
3. "A Low-Cost Remote Monitoring System Using Arduino and ModBus TCP," *2016 AASHE Conference & Expo*, Baltimore, MD, USA, 10 October 2016 (Poster).
4. "Local Farmers, Season Extension, and Technology transfer: Experiences from the "Nexus" Greenhouse project at Appalachian State," *2016 AASHE Conference & Expo*, Baltimore, MD, USA, 10 October 2016 (Poster).
5. "Energy Efficiency in Jails and Secure Detention Facilities," *2016 NC State Energy Conference*, Raleigh, NC, USA, 21 April 2016.
6. "NEXUS: Demonstration site for biomass greenhouse-heating systems to extend growing seasons for resource-limited farmers," *2015 AASHE Conference & Expo*, Minneapolis, MN, USA, 26 October 2015 (Co-Author).
7. "Identification of Potential Benefits of Using Energy Modeling by Comparing Two Campus Buildings," *ASHRAE Energy Modeling Conference*, Atlanta, GA, USA, 2 October 2015.
8. "Energy Modeling for Jails and Detention Facilities," *2015 ASHRAE Annual Conference*, Atlanta, GA, USA, 28 June 2015.
9. "Decision-Making in the Selection of Food Waste Diversion Systems by Life Cycle Assessment and Cost Benefit Analysis," *The Fourth Annual Asian Conference on Sustainability, Energy and the Environment*, Osaka, Japan, 13 June 2014.
10. "The Effect of Atmospheric Conditions on the Performance of a Landfill Gas Collection," *Solid Waste Association of North America - NC Chapter Spring Conference*, Raleigh, NC, USA, 9 April 2014.

11. "Real-time Structural Health Monitoring of Live Loads on a Flat Commercial Roof," *SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring Conference*, San Diego, CA, USA, 11 March 2013.
12. "Reliability-based Design of Foundations for Oil and Gas Elevated Platforms," *Palisade Risk Conference*, Las Vegas, NV, USA, 7 November 2012.
13. "Best Selection of Oil and Gas Environmentally Friendly Drilling Systems Using Bayesian Decision Networks," *Rina Conference, ICSOT: Developments in Fixed & Floating Offshore Structures*, Pusan, Korea, 23 May 2012.
14. "Evolution of Decision Tools for Technology Selection in Environmentally Friendly Drilling (EFD)," *Research Partnership to Secure Energy for America (RPSEA) Project Workshop – Accessible Software Developed for Application to Unconventional Resources*, Houston, TX, USA, 30 June 2011.
15. "Towards an Uncertainty-Based Design of Foundations for Onshore Oil and Gas Environmentally Friendly Drilling (EFD) Systems," *Geo-Frontiers*, Dallas, TX, USA, 15 March 2011.
16. "Towards a Risk-Based Environmentally Friendly Drilling System Selection," *16th International Petroleum and Biofuels Environmental Conference*, Houston, TX, USA, 4 November 2009.
17. "Systems Approach and Quantitative Decision Tools for Technology Selection in Environmentally Friendly Drilling," *SPE Americas E&P Environmental & Safety Conference*, San Antonio, TX, USA, 24 March 2009.
18. "Systems Approach and Decision Optimization for Technology Selection in Environmentally Friendly Drilling," *Research Partnership to Secure Energy for America (RPSEA) Forum*, College Station, TX, USA, 30 May 2008.
19. "Systems Approach for Technology Selection in Environmentally Friendly Drilling," *INFORMS Southwest Regional Conference*, College Station, TX, USA, 18 April 2008.

TEACHING EXPERIENCES

[Appalachian State University]

TEC 2758: Survey, Soils & Foundations (3 credit hours)

- This course is a combination of two short courses; one is on soils and foundations, and the other one is on construction surveying.
- Student evaluation average: 4.7 (department average: 4.3)

TEC 3039: Material Science (3 credit hours)

- In-depth introduction to the structure, characteristics, analysis, and real-world application of fundamental materials used in construction today, with an emphasis on the structure/properties/ performance interrelationship.
- Student evaluation average: 4.6

TEC 3531: Residential Construction Management (3 credit hours)

- The National Association of Home Builders (NAHB) Student Chapters Residential Construction Management Competition is one of the highlights of the annual NAHB International Builders' Show. The competition gives students the opportunity to apply skills learned in the classroom to a real construction project by completing a management proposal. This course is for the preparation of the competition.

TEC 3548: Architecture and Energy Efficiency in Korea (3 credit hours)

- This study abroad course is for students who are interested in learning historical architectural design and energy efficiency in Korea and Taiwan. The course explores to learn about historical architectural design in Asia and floor heating system technology and other energy efficient approaches to construction. Students will conduct initial research while at Appalachian State and complete their research project in Taiwan and Korea.

TEC 4103: Leadership Technical Settings - Project Risk Management (3 credit hours)

- This course aims at developing an integrated probabilistic approach (risk assessment) to project organizational design and management. Note: For Building Science majors in Integrative Design Experience Laboratory (IDEXlab) cohort only.

TEC 4638: Contemporary Problems in sustainable Technology (3 credit hours)

- This course is designed to provide students with an overview of contemporary problems facing the Sustainable Technology movement such as affordable and efficient alternative energy systems, small scale production systems, waste management and recycling, bioregional development, community and shelter design and technology transfer methodology.

TEC 4758: Planning and Scheduling (3 credit hours)

- Co-taught with Dr. Jamie Russell.

TEC 4900: Internship (6 credit hours)

- This course is designed to provide a capstone experience in which students are able to apply knowledge and skills gained through course work, and to demonstrate their capacity to function successfully in a professional setting.

[Texas A&M University]

- Fall 2009 Registered for the Graduate Teaching Academy (GTA)
- GTA is a graduate student-led organization supported by Texas A&M University. The mission is to provide professional development opportunities to equip participants in the area of college teaching.
- Spring 2009 **Co-Instructor, CVEN 687: Foundation Engineering**
- Taught various design methods of shallow and deep foundations for different soil conditions.
- 2008-2010 **Guest Lectures, PETE 661: Drilling Engineering (each spring semester)**
- Introduced and taught how to use the Web-Based Decision Optimization Tools for student's well site design term project.
- Fall 2009 **Guest Lectures, CVEN 365: Introduction to Geotechnical Engineering**
- Taught soil consolidation theory (soil compressibility).
- Spring 2008 **Guest Lectures, CVEN 687: Foundation Engineering**
- Taught various design methods of pile foundations (i.e., driven piles and drilled shafts) for different soil conditions (sand and clay).

STUDENT ADVISING

[M.S. Thesis Chair]

- **Alexandra Lowrie** (expected December 2017), Thesis Title: "*Energy Modeling of Jails: A Case Study of Watauga County Detention Facility*," Appalachian State University.
- **Jared Sanborn** (May 2017), Thesis Title: "*The Effects of Biochar as a Soil Amendment on Soil Quality and Plant Growth*," Appalachian State University.
- **David Harrill** (May 2014), Thesis Title: "*Analysis of Changes in Landfill Gas Output and the Economic Potential for Development of a Landfill Gas Control Prototype*," Appalachian State University.

[M.S. Research Advisor]

- **Mason Atkinson** (expected May 2019), "*The Effects of Biochar as a Soil Amendment on Soil Quality and Plant Growth*," Appalachian State University.
- **Jon Linck** (expected December 2018), "*Real-time Monitoring System Development at Nexus*," Appalachian State University.
- **Henry Mull** (expected December 2018), "*Bioenergy Crop Growing at Nexus*," Appalachian State University.
- **Devan Shumate** (expected May 2018), "*The Effects of Biochar as a Concrete Ingredient*," Appalachian State University.
- **Barry Febos** (expected May 2018), "*Biogas Cleaning and Storing at Nexus*," Appalachian State University.
- **Reid Anderson** (May 2017), "*Structural Health Monitoring System Development*," Appalachian State University.
- **Johnny O'Neal** (December 2016), "*Lighting Effect of Plant Growing on Aquaponics System*," Appalachian State University.
- **Nathan Anderson** (December 2016), "*NC Green Built Credit analysis*," Appalachian State University.
- **Pedro Franco** (May 2016), "*Development of a Remote Control and monitoring system for Greenhouse Heating*," Appalachian State University.
- **Chelsea Davis** (May 2016), "*Identification of Potential Benefits of Using Energy Modeling by Comparing Two Campus Buildings*," Appalachian State University.
- **Christopher Schoonover** (December 2015), "*Affect of Cycle Times on the Growth Rate of Spinach and Lettuce in an Ebb and Flow Aquaponics System*," Appalachian State University.
- **Alan Smith** (May 2015), "*Conversion of Biomass to Biofuel and Useful Biochar*," Appalachian State University.
- **Miranda Harper** (December 2014), "*Characterization of Biochar and its Effects on the Water Holding Capacity of Loamy Sand Soil: Comparison of Hemlock Biochar and Switchgrass Biochar Characteristics*," Appalachian State University.
- **Stacy Moore** (May 2013), "*Evaluating Solar Powered Attic Ventilation Fans*," Appalachian State University.
- **Janet Miller** (May 2012), "*Public Education for Residential Energy Efficiency*," Appalachian State University.

[Mentor]

- Mentored 7 undergraduate/graduate students (EPA P3 Expo participants) for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$150/student, May 2017).
- Jared Sanborn, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$300, December 2016).
- Alex Hannum, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$300, December 2016).
- Johnny O'Neal, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$300, October 2016).
- Bahareh Shirkhanloo, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$300, October 2016).
- Christopher Schoonover, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$300, December 2015).
- Chelsea Davis, mentored for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$500, October 2015).
- Alexandra Lowrie, mentored for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$250, July 2015).
- Mentored 5 undergraduate/graduate students (EPA P3 Competition participants) for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$150/student, February 2015).
- David Harrill, mentored for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$225, March 2014).
- David Harrill, mentored for *Cratis D. Williams Graduate Student Research Grant*, Office of Student Research, Appalachian State University (Funded: \$500, September 2013).
- Laura McCree, mentored for *National Association of Home Builders (NAHB) Student Chapters Outstanding Student Award* (January 2013).
- Laura McCree and Austin Westmoreland, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$250/student, December 2012).
- Mentored 7 undergraduate students (Residential Construction Management Competition participants) for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$200/student, December 2012).
- Stacy Moore, mentored for *Cratis D. Williams Graduate Student Research Grant*, Office of Student Research, Appalachian State University (Funded: \$500, September 2012).
- Laura Clark, mentored for *NAHB Student Chapters Outstanding Student Award* (February 2012).
- Levi Pritchett and Laura Clark, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$200/student, January 2012).
- Mentored 14 undergraduate students (Residential Construction Management Competition participants) for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$100/student, January 2012).

- John Arnaud, mentored for *NAHB Student Chapters Outstanding Student Award* (January 2011).
- John Arnaud and Andrew Ferguson, mentored for *Research Grant*, Office of Student Research, Appalachian State University (Funded: \$350/student, December 2010).
- Mentored 13 undergraduate students (Residential Construction Management Competition participants) for *Travel Grant*, Office of Student Research, Appalachian State University (Funded: \$225/student, December 2010).
- Al Y. Abdullah, Ph.D. dissertation on *Development of a Drilling Expert System*, Texas A&M University, Co-advised with Professors Jerome Schubert and Zenon Medina-Cetina (May 2012).
- C. Steinmetz, Undergraduate research project on *Environmentally Friendly Drilling Systems*, Texas A&M University, Co-advised with Professor Zenon Medina-Cetina (May 2010).
- Mentored J. Kim, D. Yang, H. Zhang, M. Surendra, Y. Tian, and F. Solomon for Environmentally Friendly Drilling well site design project on *Drilling Engineering (PETE 661)*, Texas A&M University (Spring 2010).

ACADEMIC SERVICES

[Journal Editorial Positions]

- **Editorial Board Member**, *Modern Management Science & Engineering*.
- **Reviewer**, *Environmental Progress and Sustainable Energy*.
- **Reviewer**, *ASCE Journal of Infrastructure Systems*.
- **Reviewer**, *Modern Environmental Science and Engineering*.
- **Reviewer**, *Journal of Buildings*.
- **Reviewer**, *Journal of Natural Gas Science and Engineering*.
- **Reviewer**, *International Journal of Low-Carbon Technologies*.

[Conference Session Chair]

- *The Fourth Annual Asian Conference on Sustainability, Energy and the Environment*, Osaka, Japan, June 12 – 15, 2014.

UNIVERSITY SERVICES

- **Member**, *Sustainable Technology and the Built Environment Department Chair Search Committee*, 2016-2017.
- **Member**, *Promotion and Tenure Committee*, 2016-Present.
- **Member**, *Program Development Committee*, 2016-Present.
- **Member**, *Curriculum Development Ad Hoc Committee*, 2016-Present.
- **Member**, *Fine and Applied Arts Dean Search Committee*, 2015-2016.
- Hosted Nexus Open House Event as part of National Bioenergy Day, a campaign to unite bioenergy supporters across the country, 2015.
- Hosted an IESVE, Building Energy Modeling Software Demonstration Seminar, 2015.
- **Member**, *QEP/ International Experiences Committee*, 2015-2016.
- **Member**, *Promotion and Tenure Policy Development Committee*, 2014-2015.
- **Faculty Advisor**, *Renewable Energy Initiative (REI)*, 2013-2016.
- **Faculty Advisor**, *REI Data Management Sub-Committee*, 2013-Present.

- **Member**, *Building Coordinator Committee*, 2011-Present.
- **Member**, *Faculty Development Committee*, 2014-2015.
- **Member**, *Web/Social Networking Committee*, 2010-2015.
- **Faculty Advisor**, *Solar Decathlon Europe 2014 Competition, Appalachian State University, USA + University of Angers, France – Maison Reciprocity*.
- Helped the team to analyze the structural stability of the proposed solar complex.
- **Member**, *QEP/ International Liaison Committee*, 2013-2014.
- **Coordinator**, *Department Equipment and Instrumentation*, 2012-2013.
- **Coordinator**, *Program Digital Media*, 2012-2013.
- **Faculty Advisor**, *Residential Construction Management Competition*, NAHB, 2010-2013.
- **Faculty Advisor**, *Student Builders Association (SBA)*, 2011-2012.
- **Consultant**, *Appalachian Solar Decathlon Project – Solar Homestead*, 2011:
- Helped the team to estimate wind load applied to the solar house.
- Won the People’s Choice Award.

OUTSIDE SERVICES

- Mentor, IDEXlab students to design and build the Farmers Market at Alleghany County, NC, 2013-2015.
- Mentor, IDEXlab students to design and build the Welcome Center at Valle Crucis Community Park, NC, 2013-2015.
- Choir Member, St. John Lee Korean Catholic Church, Charlotte, NC, 2011-2013.
- Mentor, an Eagle Scout student, College Station, TX, 2008:
- Helped him to re-build a bridge at Carter Lake Subdivision.
- President, Korean Student Association (KSA), Texas A&M University, 2006-2007:
- Handled various organizational events for about 700 Korean students and their families. KSA is the 3rd largest international student organization at Texas A&M University.
- Contributed to the organization of the Korean movie screening to introduce Korea to the university students and staffs.
- Korean Choir Member, Saint Mary Catholic Church, College Station, TX, 2005-2010.
- Student Officer, Department of Civil Engineering, KonKuk University, Seoul, Korea, 1997.
- Freshman Representative, Department of Civil Engineering, KonKuk University, Seoul, Korea, 1992.