

# Jeremy M. Gernand

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## EDUCATION

PhD      Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA, 2013  
MS      Mechanical Engineering, Rice University, Houston, TX, 2007  
BS      Mechanical Engineering, Texas A&M University, College Station, TX, 1998

## EMPLOYMENT HISTORY

2013-Present      Assistant Professor, Penn State University, University Park, PA  
2009-2013      Graduate Research Assistant, Carnegie Mellon University, Pittsburgh, PA  
2008-2009      Research Administrator, Johns Hopkins University, Gaibandha, Bangladesh  
2006-2008      Reliability Engineer, Northrup Grumman, Baltimore, MD  
2000-2006      Safety and Reliability Engineer, Science Applications International, Johnson Space Center, Houston, TX  
1998-2000      Peace Corps Volunteer, Kankalabé, Guinea

## PUBLICATIONS

† indicates graduate student advisee

‡ indicates undergraduate student advisee

### *Peer-Reviewed Journal Publications*

1. Agrawal S.† and **Gernand J.** “Quantifying the Economic Impact of Hydraulic Fracturing Proppant Selection of Light of Occupational Particulate Exposure Risk and Functional Requirements.” *Risk Analysis*. *Accepted*.
2. Ramchandran V.† and **Gernand J.** “A Dose-Response-Recovery Clustering Algorithm for Categorizing Carbon Nanotube Variants into Toxicologically Distinct Groups.” *Computational Toxicology*. doi:10.1016/j.comtox.2019.02.003. 11:25-32. August 2019.
3. Eslambolchi S.†, Grayson R., and **Gernand J.** “Policy Changes in Safety Enforcement for Underground Coal Mines Show Size-Dependent Effects.” *Safety Science*. doi:10.1016/j.ssci.2018.10.005. 112(2019):223-231. February 2019.
4. Banan Z.† and **Gernand J.** “Evaluation of Gas Well Setback Policy in the Marcellus Shale Region of Pennsylvania in Relation to Emissions of Fine Particulate Matter.” *J. of Air & Waste Management Association*. doi:10.1080/10962247.2018.1462866. 68(9):988-1000. May 2018.
5. Edinger S.‡ and **Gernand J.** “N<sub>2</sub>BET is a Proxy for Primary Particle Size and is Not Representative of Biologically Available Specific Surface Area for Aggregated Nanoparticles.” *J. of Nanosci. and Nanotech.* doi:10.1166/jnn.2018.15353 18(5):3049-3058. May 2018.

6. Silva-Castro J., Li L., and **Gernand J.** “Reliability Analysis for Mine Blast Performance Based on Delay Type and Firing Time.” *Intl. J. Of Mining Science and Tech.* doi:10.1016/j.ijmst.2017.07.004. 28(2):195-204. March 2018.
7. York J.† and **Gernand J.** “Evaluating the Performance and Accuracy of Incident Rate Forecasting Methods for Mining Operations.” *J. of Risk and Uncertainty in Engineering Systems.* doi:10.1115/1.4036309. 3(4):041001. June 2017.
8. Stone V., Johnston H., Balharry D., Gulumian M., and **Gernand J.** “Approaches to Develop Alternative Testing Strategies to Inform Human Health Risk Assessment of Nanomaterials.” *Risk Analysis.* doi:10.1111/risa.12645. 36(8):1538-1550. August 2016.
9. **Gernand J.** “Evaluating the Effectiveness of Mine Safety Enforcement Actions in Forecasting the Lost-Days Rate at Specific Work Sites.” *J. of Risk and Uncertainty in Engineering Systems.* doi:10.1115/1.4032929. 2(4):041002. March 2016.
10. **Gernand J.** and Casman E. “Nanoparticle Characteristic Interaction Effects on Pulmonary Toxicity - A Random Forest Modeling Framework to Compare Risks of Nanomaterial Variants.” *J. of Risk and Uncertainty in Engineering Systems.* doi:10.1115/1.4031216. 2(2):021002. January 2016.
11. **Gernand J.** and Casman E. “A Meta-Analysis of Carbon Nanotube Toxicity Experiments - How Physical Dimensions and Purity Affect the Toxicity of Carbon Nanotubes.” *Risk Analysis.* 34(3):583-597. doi:10.1111/risa.12109. March 2014.
12. **Gernand J.** and Bayazitoglu Y. "Spiral Methanol to Hydrogen Micro-Reformer for Fuel Cell Applications." *Heat Transfer Engineering.* 30(14):1188-1196. doi:10.1080/01457630902975903. December 2009.

#### ***Other Refereed Journal Publications***

13. Casman E. and **Gernand J.** “Seeing the Trees for the Forest.” *Nature Nanotechnology.* doi:10.1038/nnano.2016.5. February 2016.
14. **Gernand J.** and Casman E. “Machine Learning for Nanomaterial Toxicity Risk Assessment.” *IEEE Intelligent Systems.* 29(3):84-88. doi:10.1109/MIS.2014.48. May-June 2014.

#### ***Peer-Reviewed Book Chapter***

15. **Gernand J.** “Understanding and Preparing for Human Bias in the Assessment of Risks.” Chapter 24 in *Safety Leadership and Professional Development.* Eds: Olawoyin R. and Hill D. American Society of Safety Professionals (ASSP). Park Ridge, IL. pp. 319-332. ISBN: 978-0-939874-18-7. 2018.

#### ***Peer-Reviewed Publications in Conference Proceedings***

16. **Gernand J.** “An Analysis of the Trends in US Offshore Oil and Gas Safety and Environmental Performance.” *Proc. of IMECE2019.* *Accepted.*
17. Ramchandran V.† and **Gernand J.** “Examining Pulmonary Toxicity of Engineered Nanoparticles Using Clustering for Safe Exposure Limits.” *Proc. Of IMECE2018.* No. 87431. doi:10.1115/IMECE2018-87431. November 2018.

18. **Gernand J.** “A Set of Preliminary Model Experiments for Studying Engineering Student Biases in the Assessment and Prioritization of Risks.” *Proc. Of IMECE2018*. No. 87888. doi:10.1115/IMECE2018-87888. November 2018.
19. **Gernand J.** “Occupational Safety Implications of the Changing Energy Mix.” *Proc. Of IMECE2018*. No. 86678. doi:10.1115/IMECE2018-86678. November 2018.
20. **Gernand J.** “Evaluation of Risk Reduction Effectiveness in OSHA’s Workplace Sampling Activities.” *Proc. of IMECE2016*. No. 65942. doi: 10.1115/IMECE2016-65942 November 2016.
21. **Gernand J.** “Limitations on the Reliability of In Vitro Toxicity Experiments to Predict Pulmonary Toxicity in Rodents.” *Proc. of IMECE2016*. No. 67151. doi: 10.1115/IMECE2016-67151. November 2016.
22. **Gernand J.** “Educating Engineering Students on Probabilistic Risk: Effects on the Perception of Ethics, Professional Responsibility, and Personal Agency.” *Proc. of IMECE2015*. No. 53055. doi:10.1115/IMECE2015-53055. November 2015.
23. York J.† and **Gernand J.** “Ascertainment of the Archetype Statistical Method for Incident Rate Forecasting Through Forecast Performance Evaluations.” *Proc. of IMECE2015*. No. 53138. doi:10.1115/IMECE2015-53138. November 2015.
24. **Gernand J.** “Particulate Matter: Fine and Ultrafine - How Emerging Data on Engineered Nanomaterials May Change How We Regulate Worker Exposures to Dust.” *Proc. of IMECE2015*. No. 53056. doi:10.1115/IMECE2015-53056. November 2015.
25. **Gernand J.** “Machine Learning Classification Models for More Effective Mine Safety Inspections.” *Proc. of IMECE2014*. No. 38709. doi:10.1115/IMECE2014-38709. November 2014.
26. **Gernand J.** and Casman E. “Selecting Nanoparticle Properties to Mitigate Risks to Workers and the Public - A Machine Learning Modeling Framework to Compare Pulmonary Toxicity Risks of Nanomaterials.” *Proc. of IMECE2013*. No. 62687. doi:10.1115/IMECE2013-62687. November 2013.
27. **Gernand J.** “Mitigating Crew Health Degradation During Long-Term Exposure to Microgravity through Countermeasure System Implementation.” *Proc. of IMECE2004*. No. 59029. doi:10.1115/IMECE2004-59029. November 2004.

#### ***Submitted Manuscripts Currently in Review at Peer Reviewed Journals***

1. Ramchandran V.† and **Gernand J.** “Examining the In Vivo Pulmonary Toxicity of Engineered Metal Oxide Nanomaterials Using a Genetic Algorithm-Based Dose-Response-Recovery Clustering Model.” *Computational Toxicology*. *Revisions Requested*.
2. Lai K.‡, Looi S.‡, Li M.†, İlçi F.†, Naushad H.‡, and **Gernand J.** “Characterization of User PM Exposure During the Application of Aerosol Mineral-Based Sunscreens Shows Minimal Risk.”
3. Banan Z.† and **Gernand J.** “Emissions of Particulate Matter due to Marcellus Shale Gas Development in Pennsylvania: Mapping the Implications.”
4. İlçi F.†, Li M.†, and **Gernand J.** “Detailed Physico-Chemical Characterization of the Ambient Fine and Ultrafine Particulate Matter at a Construction Site.”
5. Lashgari A., Kohler J., and **Gernand J.** “An Evaluation of a Compliance Sampling Program for Respirable Dust.”

6. Li M.<sup>†</sup> and **Gernand J.** “Identifying Shelter Locations and Building Air Intake Risk from Release of Particulate Matter in a Three-Dimensional Street Canyon.”
7. **Gernand J.** “The Occupational Safety Implications of the California Residential Rooftop Solar Photovoltaic Systems Mandate.”
8. Marone A., Kane C., Jenkins G., and **Gernand J.** “Characterization of Aerosol Bacteria from Dust Events in Dakar, Senegal.”
9. **Gernand J.** “A Set of Estimation and Decision Preference Experiments to Measure and Study Engineer Risk Biases.”

#### ***Manuscripts Currently in Preparation for Submittal to Peer Reviewed Journals***

1. Banan Z.<sup>†</sup> and **Gernand J.** “Health Impacts of PM<sub>2.5</sub> Exposure Due to Marcellus Shale Gas Development in Pennsylvania.”
2. Ramchandran V.<sup>†</sup> and **Gernand J.** “Model Predicted NOAELs for Estimating Safe Exposures to Engineered Nanomaterials.”
3. Mol MF.<sup>†</sup> and **Gernand J.** “Particulate Matter Emissions Associated with Marcellus Shale Drilling Waste Transport and Disposal.”
4. Lashgari A., Kohler J., and **Gernand J.** “A CART Model for the Prediction of High-Dust Exposure Job Categories in the Mining Industry.”
5. Midlick M.<sup>‡</sup> and **Gernand J.** “Engineering Student Biases in Risk-Relevant Project Investment Decisions.”
6. Eslambolchi S.<sup>†</sup> and **Gernand J.** “Policy Changes and Related Economic Transitions in the US Underground Coal Industry.”
7. **Gernand J.** “The Forecast Occupational Safety Impact of the Changing US Energy Portfolio.”
8. McDonald A., Wang M., Banan Z.<sup>†</sup>, and **Gernand J.** “Heavy Metal Exposures and the Incidence of Aggressive Prostate Cancer in Pennsylvania.”

#### **PATENT**

1. Bayazitoglu Y. and **Gernand J.** “Spiral Microreformer Assembly.” U.S. Patent 8,034,134. October 2011.

#### **PRESENTATIONS**

1. **Gernand J.** “Machine Learning Applications in Safety Management.” Central PA Safety Association Meeting. State College, PA. January 2019. [Invited]
2. **Gernand J.** “The Risks of Miscommunication and Missing Data.” Scholarship and Research Integrity (SARI) Series. University Park, PA. September 2018.
3. **Gernand J.** “Evaluating the Risks and Policy Responses for Air Emissions from Natural Gas Production in Pennsylvania.” Energy and Mineral Engineering Research Showcase. State College, PA. September 2018.

4. Banan Z. † and **Gernand J.** “Mapping the Emissions Exposure Risk Due to Hydraulic Fracturing in Pennsylvania.” PSU Energy Days. University Park, PA. May 2018.
5. Banan Z. † and **Gernand J.** “Mapping the Emissions Exposure Risk Due to Hydraulic Fracturing in Pennsylvania.” SRA Annual Meeting, Arlington, VA. December 2017.  
*This paper won the Student Merit Award from the Risk and Development Specialty Group of the Society for Risk Analysis (SRA)*
6. Banan Z. † and **Gernand J.** “Heterogeneity of Exposure to Particulate Matter Emissions Due to Marcellus Shale Gas Development in Pennsylvania.” Air and Waste Management Association, Pacific Northwest International Section (PNWIS) Annual Conference, Boise, ID. November 2017.  
*This paper won the AWMA First Student Paper Award*
7. Banan Z. † and **Gernand J.** “Evaluation of the Heterogeneity of Exposure to Gas Well Particulate Matter Emissions in the Marcellus Shale Region of PA.” PSU Energy Days, University Park, PA. May 2017.
8. **Gernand J.** “Inferring the Economic Impact of Safety Incidents with a Random Forest Model.” SME Annual Conference and Exposition. Denver, CO. February 2017.
9. Agrawal S. †, Rostami J., **Gernand J.**, and Liu S. “Estimation of Roof Rating from the Data Collected by a Special Borehole Probe and Its Visualization.” SME Annual Conference and Exposition. Denver, CO. February 2017.
10. **Gernand J.** “Hazards and Risks of Additive Manufacturing (3D Printing).” Central PA Safety Association Meeting. State College, PA. February 2017. [Invited]
11. **Gernand J.** “Testing the Validity of Proposed *In Vitro* Toxicity Forecasting Models for Predicting Responses in Rodents.” SRA Annual Meeting. San Diego, CA. December 2016.
12. Banan, Z. † and **Gernand J.** “Quantification of Emissions Exposure Risk from Hydraulic Fracturing in the Marcellus Shale Region of Pennsylvania.” SRA Annual Meeting. San Diego, CA. December 2016.
13. Ramchandran V. † and **Gernand J.** “A Clustering Analysis of CNT Pulmonary Toxicity in Rodents.” SRA Annual Meeting. San Diego, CA. December 2016.  
*This paper won the Student Merit Award from the Emerging Nanoscale Materials Specialty Group of the Society for Risk Analysis (SRA)*
14. Looi S. ‡, Lai K. ‡, Naushad H. ‡, İlçi F. †, and **Gernand J.** “Identification and Characterization of Fine- and Nano-particles in Mineral Based Consumer Aerosol Sunscreens.” EMS Undergraduate Research Exhibition. University Park, PA. December 2016.
15. Gernand A., Mahmud A., Papp E., Shi J., **Gernand J.**, and Roth D. “Application of a Machine Learning Approach to Identify Predictors of Vitamin D Status in Pregnancy.” Micronutrient Forum. Cancun, Mexico. October 2016.
16. Argawal S. † and **Gernand J.** “Risk Based Decision Making for Fracturing Proppant Selection.” Penn State Energy Days. May 2016.  
*This paper won a PSU Energy Days Best Poster Award*
17. Banan Z. † and **Gernand J.** “Air Emissions Exposure Risks from Hydraulic Fracturing in the Marcellus Shale Region of PA.” Penn State Energy Days. May 2016.  
*This paper won a PSU Energy Days Best Poster Award*

18. Agrawal S.<sup>†</sup> and **Gernand J.** “Policy changes in coal mining: Comparison and effectiveness on reducing accidents in United States and Australia.” SME Annual Conference and Exposition. Phoenix, AZ. February 2016.
19. **Gernand J.** “Important Thresholds in Anticipating Safety Incidents: A Machine Learning Analysis of MSHA Data to Evaluate Current Policy.” SME Annual Conference and Exposition. Phoenix, AZ. February 2016.
20. **Gernand J.** “Nanoinformatics: Advances, Applications, and Assessing the Continuing Challenge of Uncertainty.” SRA Annual Meeting. Arlington, VA. December 2015.
21. Ramchandran V.<sup>†</sup> and **Gernand J.** “A Clustering Analysis Algorithm for the Examination of CNT Pulmonary Toxicity in Rodents” SRA Annual Meeting. Arlington, VA. December 2015.
22. İlçi F.<sup>†</sup> and **Gernand J.** “Detailed Characterization and Hazard Level Analysis of the Ambient Fine and Ultrafine Particulate Mixture at a Construction Site.” SRA Annual Meeting. Arlington, VA. December 2015.
23. Agrawal S.<sup>†</sup> and **Gernand J.** “Risk-Based Decision Making for Fracturing Proppant Selection” SRA Annual Meeting. Arlington, VA. December 2015.
24. Banan Z.<sup>†</sup> and **Gernand J.** “Heterogeneity of Emissions Exposure Risk from Hydraulic Fracturing in the Marcellus Shale Region of Pennsylvania and Implications for Permitting Policy.” SRA Annual Meeting. Arlington, VA. December 2015.  
*This paper won the Student Merit Award from the Applied Risk Analysis Specialty Group of the Society for Risk Analysis (SRA)*
25. **Gernand J.** “Assessing the Risks of Nanotechnology for Workers.” Engineering Science and Mechanics Graduate Seminar. University Park, PA. September 2015.
26. Ramchandran V.<sup>†</sup> and **Gernand J.** “How Many Separate Classes of Nanomaterials are There? Results from a Clustering Analysis of Pulmonary Exposure Studies in Rodents.” Safety of Engineered Nanoparticles and Nanotechnologies (SENN). Helsinki, Finland. April 2015.
27. İlçi F.<sup>†</sup> and **Gernand J.** “Detailed Size and Chemical Characterization of Ultrafine Particles in Workplaces and Comparison to Toxicity Studies with Engineered Nanoparticles.” Safety of Engineered Nanoparticles and Nanotechnologies (SENN). Helsinki, Finland. April 2015.
28. **Gernand J.** “Evaluation of the Predictive Capabilities of MSHA Inspection Results and Organizational Characteristics via Random Forest Classification and Regression Models.” SME Annual Conference and Exposition. Denver, CO. February 2015.
29. **Gernand J.**, Casman E., and Ramchandran V.<sup>†</sup> “Evaluation of the Information Content in Proposed QSAR Descriptors via Machine Learning Meta-Analysis of *In Vivo* Nanotoxicity Experiments.” Nanoinformatics 2015. Washington, DC. January 2015.
30. **Gernand J.** and İlçi F.<sup>†</sup> “Characterizing Ambient Nanoparticle Distributions in Workplaces.” SRA Annual Meeting. Denver, CO. December 2014.
31. **Gernand J.** “A Treed Exponential Model Approach for Quantifying the Importance of Physicochemical Characteristics in Predicting Nanomaterial Toxicity.” NanoRisk Workshop II. Washington, DC. September 2014.
32. **Gernand J.** “Data Integrity and Truth: Consequences for Understanding by Decision Makers, the Public, and Fellow Researchers.” Scholarship and Research Integrity Series. University Park, PA. January 2014.
33. **Gernand J.** and Casman E. “Treed Exponential Models for the Analysis of Nanomaterial Dose-Response Relationships.” SRA Annual Meeting. Baltimore, MD. December 2013.

34. **Gernand J.** “Applications of Data (Re-)Sampling and Analytical Effects.” University Park, PA. October 2013.
35. **Gernand J.** “Machine-Learning-Based Risk Assessment Models for the Toxicity of Nanomaterials.” EME Seminar Series. University Park, PA. September 2013.
36. **Gernand J.** “Inhaled Nanoparticles and Occupational Risk: Can We Make Them Safer?” Penn State University. University Park, PA. June 2013.
37. **Gernand J.** “A Predictive Model for Pulmonary Toxicity of Carbon Nanotubes - Implications for Nanomaterial Characterization Standards.” Nanoinformatics 2011. Washington, DC. December 2011.
38. **Gernand J.** and Casman E. “Identifying Information-Rich Attributes for Nanomaterial Risk Assessment: An Analysis of Carbon Nanotube Inhalation Toxicity Experiments.” ICEIN 2011. Durham, NC. May 2011.
39. **Gernand J.** “Machine Learning Models for Risk Assessment Meta-Analysis under Uncertainty.” Scientists and Engineers for America Meeting. Carnegie Mellon University, Pittsburgh, PA. April 2011.
40. **Gernand J.** and Casman E. “Identifying Information-Rich Attributes for Nanomaterial Risk Assessment: A Machine Learning Analysis of Carbon Nanotube Inhalation Toxicity Experiments.” SRA Annual Meeting. Salt Lake City, UT. December 2010.  
*This paper won the Student Merit Award from the Emerging Nanoscale Materials Specialty Group of the Society for Risk Analysis (SRA)*
41. **Gernand J.** and Casman E., “Identifying Critical Attributes for Nanomaterial Risk Assessment: An Investigation of Parameters Affecting Carbon NanoTube Inhalation Toxicity.” JHU Inst. for BioNanoTech 4<sup>th</sup> Annual Symposium. Baltimore, MD. April 2010.

## GRANTS AND CONTRACTS

### *External Funding*

1. “Forecasting Pulmonary Inflammation from In Vitro Assay Results for Nanoparticles.” PI: Gernand J. Total Budget: \$133,470. Period of Performance: Sept 2015 to Aug 2017. Sponsor: National Institute for Occupational Safety and Health (NIOSH)
2. Testing the Predictive Power of Nanoparticle Characteristics for In Vitro and In Vivo Toxicity.” PI: Gernand J. Total Budget: \$87,795. Period of Performance: Jul 2014 to Aug 2015. Sponsor: Center for the Environmental Implications of Nanotechnology (CEINT), Duke University
3. “Characterizing the Ambient Background Nanoparticle Distributions in Workplaces.” PI: Gernand J. Total Budget: \$12,960. Period of Performance: Apr 2014 to Aug 2015. Sponsor: National Institute of Occupational Safety and Health (NIOSH)

### *Internal Funding*

4. “An Engineering Design Simulator for Risk-Related Decision Making.” PI: Gernand J. Total Budget: \$3,972. Period of Performance: Jan 2019 to Dec 2019. Sponsor: College of Earth and Mineral Science, Penn State University

5. “Investigating Indoor Air Pollutant Variability, Source Contributions, and Respiratory Health in Senegal.” PI: Gernand J. Total Budget: \$50,000. Period of Performance: Nov 2018 to Jun 2020. Sponsor: Penn State Institute for Energy and the Environment
6. “Heavy Metal Exposures and Aggressive Prostate Cancer.” PI: McDonald A. (Gernand J. - Collaborator). Total Budget: \$50,000. Period of Performance: Jul 2018 to Jun 2020. Sponsor: Penn State Institute for Energy and the Environment
7. Collecting and Characterizing Saharan Dust and Associated Pathogens for Evaluating Disease Risk across the Meningitis Belt and Cape Verde.” PI: Jenkins G. (Gernand J. - Co-PI). Total Budget: \$25,000. Period of Performance: Mar 2016 to Dec 2016. Sponsor: Penn State Institute for Energy and the Environment
8. “Connecting Cells to Worms to Mice to Workers: Extending Nanomaterial Toxicity Modeling for Environmental and Occupational Risk Assessment.” PI: Gernand J. Total Budget: \$3,036. Period of Performance: Feb 2014 to Dec 2014. Sponsor: College of Earth and Mineral Sciences, Penn State University

## **HONORS AND AWARDS**

Gladys Snyder Junior Faculty Grant, Penn State College of Earth and Mineral Sciences, 2019

Virginia S. and Phillip L. Walker Faculty Fellowship, 2014-2015

Gladys Snyder Junior Faculty Grant, Penn State College of Earth and Mineral Sciences, 2014

Bertucci Graduate Fellowship, Carnegie Mellon University, 2012

Bushnell Fellowship in Engineering, Carnegie Mellon University, 2012

Prim Narain Srivastava Legacy Fellowship, Carnegie Mellon University, 2011

Student Merit Award, Society for Risk Assessment, Emerging Nanoscale Materials Specialty Group, Society for Risk Analysis (SRA), 2010

National Science Foundation Graduate Fellowship – Honorable Mention, 2010

Carnegie Institute of Technology Dean’s Fellowship, Carnegie Mellon University, 2009

Northrop Grumman President’s Leadership Award – Division Level, 2008

NASA Quality Assurance Special Achievement Recognition (QASAR) Johnson Space Center, 2002

NASA Group Achievement Award (CEVIS Failure Investigation Team), 2002

## TEACHING EXPERIENCE

### *Undergraduate Courses Taught*

\*Indicates a co-instructed course

<b>Term</b>	<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>	<b>Enrollment</b>	<b>Instructor Quality Score</b>
SP 2019	ENVSE 470	Engineering Risk Analysis	3	42	5.9/7
FA 2018	ENVSE 400	Safety Engineering	3	26	6.0/7
SP 2018	ENVSE 470	Engineering Risk Analysis	3	33	4.7/7
FA 2017	ENVSE 400	Safety Engineering	3	35	6.1/7
SP 2017	ENVSE 470	Engineering Risk Analysis	3	40	6.4/7
SP 2017	EBF 304W	Global Management for the Earth, Energy, and Materials Industries	3	35	5.4/7
FA 2016	ENVSE 400	Safety Engineering	3	36	5.7/7
SP 2016	EME 460*	Geo-Resource Evaluation and Investment Analysis	3	195	4.8/7
SP 2016	EBF 304W	Global Management for the Earth, Energy, and Materials Industries	3	33	4.7/7
SP 2016	ENVSE 470	System Safety and Risk Engineering	3	26	5.1/7
FA 2015	ENVSE 400	Safety Engineering	3	34	5.6/7
SP 2015	EBF 304W	Global Management for the Earth, Energy, and Materials Industries	3	31	5.6/7
SP 2015	ENVSE 470	System Safety and Risk Engineering	3	27	5.6/7
FA 2014	ENVSE 400	Safety Engineering	3	39	5.7/7
SP 2014	EBF 304W	Global Management for the Earth, Energy, and Materials Industries	3	33	5.4/7
SP 2014	ENVSE 470	System Safety and Risk Engineering	3	20	5.6/7

### *Graduate Courses Taught*

<b>Term</b>	<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>	<b>Enrollment</b>	<b>Instructor Quality Score</b>
SP 2019	EME 551	Safety Health and Environmental Risks in Energy and Mineral Engineering Systems	3	8	6.7/7
FA 2016	EGEE 597	Machine Learning for Engineering Problems	3	22	6.4/7

<b>Term</b>	<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>	<b>Enrollment</b>	<b>Instructor Quality Score</b>
FA 2014	EGEE 597	Machine Learning for Engineering Problems	2	8	6.4/7
FA 2013	EME 590*	Colloquium	1	27	6.3/7

### ***Curricular Development***

Redesigned Course: ENVSE 470, Engineering Risk Analysis. Developed all new course notes, assignments, exams and assessments, and a course project. The objective of the redesign was to provide training in both qualitative and quantitative risk analysis for engineered systems including FMEA, FTA, reliability mathematics, and the probabilistic analysis of test data.

New Course Development: EME 524, Machine Learning for Energy and Mineral Engineering Problems. I developed this course to provide well-grounded practical training in the application of machine learning techniques to engineering problems. This course was conducted as EGEE 597 in Fall 2014 and Fall 2016.

New Course Development: EME 551, Safety and Environmental Risk Analysis in EME Systems. I develop a new core course for the EME graduate program to provide training for safety and environmental risk assessment in the energy and mining and minerals processing industries. This course was conducted for the first time in Spring 2019.

## **MENTORING**

### ***PhD Advisees Completed***

1. Banan, Zoya. PhD in Energy and Mineral Engineering—Energy Management and Policy Option. 2019.
2. Ramchandran, Vignesh. PhD in Energy and Mineral Engineering. 2019.
3. Eslambolchi, S. Safa. PhD in Energy and Mineral Engineering. 2016.

### ***MS Advisees Completed***

1. Mol, M. Furkan. MS in Energy and Mineral Engineering—Environmental Health and Safety Option. 2018
2. Li, Mengfan. MS in Energy and Mineral Engineering—Environmental Health and Safety Option. 2018.
3. Agrawal, Sidharth. MS in Energy and Mineral Engineering—Mining and Minerals Processing Option. 2017.
4. York, Jason. MS in Energy and Mineral Engineering—Environmental Health and Safety Option. 2015.
5. İlçi, Firdevs. MS in Energy and Mineral Engineering—Environmental Health and Safety Option. 2015.

### ***Undergraduate Research Advisees Completed***

1. Midlick, Mark. BS in Engineering Science. 2019.
2. Ai, Chao. BS in Materials Science and Engineering. 2019.
3. Huang, Tianheng. BS in Statistics. 2018.
4. Tan, Yueyue. BS in Environmental Systems Engineering. 2018.
5. Wang, Tianbo. BS in Environmental Systems Engineering. 2018.
6. Naushad, Hanah. BS in Materials Science and Engineering. 2017.
7. Looi, Shu-Wei. BS in Environmental Systems Engineering. 2016.
8. Lai, Kexin. BS in Environmental Systems Engineering. 2016.
9. Enger, Anthony. BS in Chemical Engineering. 2016.
10. Edinger, Steven. BS in Environmental Systems Engineering. 2015.
11. Borst, Jacob. BS in Environmental Systems Engineering. 2015.

### ***Advisees in Progress***

1. Isaac-Onwah, Uzoezi. BS/MS IUG Student in Petroleum and Natural Gas Engineering and Energy and Mineral Engineering—Energy Systems Option. Expected Graduation Date: Fall 2020.
2. Liu, Yichen. BS Student in Environmental Systems Engineering. Expected Graduation Date: Spring 2021.

## **SERVICE**

### ***Service to the Profession***

Chair, Safety Engineering and Risk Analysis Division (SERAD), American Society of Mechanical Engineers (ASME), 2019-2020

Vice Chair, Safety Engineering and Risk Analysis Division (SERAD), American Society of Mechanical Engineers (ASME), 2018-2019

Session Chair, International Mechanical Engineering Congress and Exposition (IMECE), American Society of Mechanical Engineers (ASME), 2018

2<sup>nd</sup> Vice Chair, Treasurer, Safety Engineering and Risk Analysis Division (SERAD), American Society of Mechanical Engineers (ASME), 2017-2018

Track Co-Chair, IMECE 2017 Conference SERAD Organizing Committee, ASME, 2017

Past-Chair, Emerging Nanoscale Materials Specialty Group, Society for Risk Analysis, 2017

4<sup>th</sup> Vice Chair, Secretary, Safety Engineering and Risk Analysis Division (SERAD), American Society of Mechanical Engineers (ASME), 2016-2017

Guest Editor, *Journal of Risk and Uncertainty in Engineering Systems, Part B*, 2015-2016

Session Chair, Society for Risk Analysis Annual Meeting, 2016

Session Chair, International Mechanical Engineering Congress and Exposition (IMECE), American Society of Mechanical Engineers (ASME), 2016

Member, Program Organizing Committee, Society for Risk Analysis Annual Meeting, 2016

Chair, Emerging Nanoscale Materials Specialty Group, Society for Risk Analysis, 2016

Secretary/Treasurer, Emerging Nanoscale Materials Specialty Group, Society for Risk Analysis, 2015

Member, Program Organizing Committee, Society for Risk Analysis Annual Meeting, 2015

### ***Service to the Department and University***

Member, EME Environmental Systems Engineering Search Committee, 2017-2018

Member, EME Department Committee on Computing and Marketing, 2017-2018

Member, EME Energy Engineering Search Committee, 2016-2017

Faculty Judge, Upward Bound Math and Science Academy Research Competition, 2016

Member, Proposal Review Committee, Upward Bound Math and Science Academy Research Competition, 2016

Member, EME Graduate Program and Research Committee, 2015-2016

Member, Sub-Committee on EME Graduate Options

Member, Sub-Committee on EME Core Courses

Member, EME Energy Engineering Search Committee, 2015-2016

Faculty Judge, EMS Undergraduate Research Exhibition, 2015

Faculty Judge, Upward Bound Math and Science Academy Research Competition, 2015

Faculty Judge, EMS Undergraduate Research Exhibition, 2014

### **LICENSES AND CERTIFICATIONS**

Certified Reliability Engineer, #8637, American Society for Quality (ASQ), 2015-2022

Certified Safety Professional, #30580, Board of Certified Safety Professionals (BSCP), 2015-2020

### **PROFESSIONAL MEMBERSHIPS**

American Society of Mechanical Engineers (ASME), 2001-Present

Society for Risk Analysis (SRA), 2010-Present

American Society for Quality (ASQ), 2015-Present

Air and Waste Management Association (A&WMA), 2016-Present