

Sekhar Bhattacharyya – Curriculum Vitae

Associate Teaching Professor of Mining Engineering
John and Willie Leone Family Department of Energy and Mineral Engineering
The Pennsylvania State University
email: spb1029@psu.edu

Professional Highlights:

Program Leadership: Served as the Mining Engineering Program Chair from 2019 to 2023, successfully guiding the program through ABET accreditation and bolstering its academic and industry reputation, despite the challenges posed by the COVID-19 pandemic.

Industry Experience: Possess over 20 years of experience in the Resource and Energy sectors, encompassing roles in production, project management, consulting, and executive leadership. Hold Professional Engineer (PE) and Foreman's licenses.

Academic Contributions: Served as an Associate Professor for nearly a decade, managing research projects totaling over \$6 million in sponsored funding. Taught five courses annually, developed curricula, and supervised and co-supervised over ten graduate students, guiding them to successful Ph.D. and M.S. completions.

Publications and Recognition: Authored book chapters, published peer-reviewed journal articles, and delivered keynote and invited speeches at prominent industry conferences. My introductory mining course was featured on the National Mining Association's CoreSafety TV, underscoring its educational impact.

Professional Service and Outreach: Actively contributed to the executive committees of the Society for Mining, Metallurgy & Exploration (SME). Fostered numerous university-industry collaborations, including establishing a Memorandum of Understanding (MOU) between two leading universities. Additionally, I serve as an advisor for the Boy Scouts of America and local high schools, supporting youth development and STEM education.

❖ EDUCATION:

Ph.D., Mining Engineering, The University of Utah, 2009.

M.S., Mining Engineering, Montana Tech of the University of Montana, 2002.

M.B.A., Financial Management, The University of Calcutta, India, 1999.

B.E. (Bachelor of Engineering), Mining Engineering, The University of Calcutta, 1994.

❖ CERTIFICATIONS and LICENSURES:

- Registered Professional Engineer (PE), Utah.
- Certified Underground Mine Foreman - Pennsylvania and West Virginia.
- Qualified Person (QP) in Recognized Overseas Professional Organization (ROPO).

❖ ACADEMIC APPOINTMENTS: (Details at the end of document; TA/RA not included)

Associate Teaching Professor, Pennsylvania State University. (August 2023 - Present).

Teach required and core courses in Mining Engineering. Help course administration and ABET accreditation. Research mine health and safety. Serve graduate committees, SME Society, BSA, and school districts.

Chair & Associate Teaching Professor, Penn State University. (November 2019 - July 2023).

Taught core courses for Mining Engineering. Managed Course Administration, Outreach, Recruiting and ABET accreditation. Led research mine health and safety. Served graduate committees, SME Society, BSA.

Associate Professor, Pennsylvania State University. (August 2017 - October 2019).

Taught required courses for Mining Engineering. Helped course administration. Conducted research in mine health and safety. Served undergraduate committees, SME Society, and BSA.

Associate Professor, New Mexico Tech. (September 2015 - July 2017).

Taught core courses for Mining Engineering and ran a ventilation lab. Help ABET accreditation. Research mine health and safety. Serve graduate committees, SME Society.

Visiting Faculty, The University of Utah. (January 2015 - September 2015).

Teach courses in underground mining and mineral economics.

❖ **INDUSTRIAL APPOINTMENTS:** (Details at the end of this document)

Senior Mining Engineer, Norwest Corporation (now Stantec). (May 2013 - January 2015).

Designed mine operation and mine ventilation. Calculate capital and operating costs. Wrote pre-feasibility reports. Field studies for mine valuation and merger/acquisition.

Section Foreman and Mine Engineer, Consol Energy Inc. (May 2009 - May 2013).

Ran frontline underground coal mine operation and safety. Designed mine infrastructure. Short and medium-term mine planning. Prepared presentation materials for VP meetings, and statutory forms.

Manager Projects, Joy Global (presently Komatsu). (December 9, 2005 - July 27, 2008).

Managed production, ground control, and contracts for four underground coal mines. Ran operation of one underground mine. Overall, in charge of all contracts for India operations.

Deputy Manager - Mining Project, Calcutta Electric Supply Corporation. (July 1994 - August 2000).

Prepared pre-feasibility reports for a mine under planning. Presented reports to the World Bank to procure financing. Prepare and present weekly and monthly reports for higher management of the company.

❖ **ADMINISTRATIVE ASSIGNMENT**

Program Chair, Mining Program, approximately 500 hours spent per year. (November 1, 2019 - July 31, 2023).

Managed courses, Lead ABET evaluation, assign courses to faculty, Managed IPAC, Outreach for student career, Outreach for recruiting BS students, Arranged fieldtrips.

Professor-In-Charge for ABET Evaluations, approximately 70 hours per year. (May 1, 2019 - Present).

Continue to gather information for ABET evaluations; Coordinate with faculty; Write self-assessment reports; Lead during ABET evaluators visit.

❖ **CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

- Society for Mining, Metallurgy & Exploration (SME), Member: 2000-Present.
- SME Registered Member (ROPO): 2012-Present.
- National Mine Rescue Association (NMRA): 2018-Present.

❖ **SPONSORED RESEARCH:**

- “Characterization of forms of silica with varying degrees of crystallinity in respirable dust to assess their effects on miners’ pneumoconiosis.” Sponsored by National Institute for Occupational Safety and Health (NIOSH). 2022 to 2025. \$325K. **PI.**
- “Understanding and Design of Ventilation Systems and Their Optimization for Large Opening Underground Mines” Sponsored by NIOSH. 2019 to 2024. \$1.25M. **PI.**
- “Designing a Safe Electrification System for Smart Mines Through Ventilation Modeling, Monitoring, Control, and Training,” National Institute for Occupational Safety and Health (NIOSH). 2024 to 2029. \$1.25M. Co-PI.
- "Review of Industrial Practices and the Use of Compulsory PPE Related to Miners in Areas of High Risk: Airstream Helmet/Power Air Purifying Respirator (PAPR) to Minimize Respir." 2024-2026. Sponsor: NIOSH. \$278K. Co-PI.
- “Development of Respirable Crystalline Silica Training Modules,” US Department of Labor. 2024-2025. \$149K. Co-PI.
- "Opioid and Drug Misuse and Overdose in Rural Coal Communities in the Post-COVID Era of Energy Transition" Sponsor: USDA National Institute of Food and Agriculture; 2023-2026. \$643K. Co-PI.
- “Reduction or Elimination of Coal Mining Related Respirable Dust Toxicity by Selection and Proper Application of Dust Control Additives.” Sponsored by National Institute for Occupational Safety and Health (NIOSH). 2021 to 2024. \$328K. Co-PI.
- “Consortium to Assess Northern Appalachian Resource Yield (CANARY) of CORE-CM for Advanced Materials.” DOE contract # DE-FE0032052. 2021. \$1.3M. Co-PI.
- “Characterization of Submicron-/Nano-scale Coal Dusts and Their Effects on Miners’ Pneumoconiosis and Lung Cancer for Underground Coal Mines.” Sponsored by NIOSH. 2019 to 2022. \$400K. Co-PI.
- “Reduction of Noise Exposure in Underground Mines by Improving Auxiliary Ventilation Technologies.” Investigators: Felipe Calizaya and Sekhar Bhattacharyya. Sponsored by NIOSH. 2015 to 2017. \$235K. Co-PI.

Other HONORS AND AWARDS:

- Wilson Travel Grant from EMS College, Penn State; 2023.
- Wilson Research (alt) Grant from EMS College, Penn State; 2020.
- Gladys Snyder Grant from EMS College, Penn State; 2020.
- Student Advisory Committee (SAC) – Graduate Chair at the Univ of Utah. 2003-2004.
- All India rank 8th in GATE (Graduate Aptitude Test in Engineering).1994.
- S. Lal award for highest grade at bachelor's degree in mining engineering.1994.

❖ **PUBLICATIONS (excludes invited lectures at universities and to industries)**

Book Chapters

“Longwall Mining” in *SME Underground Mining Handbook*, SME, Littleton, CO, 2022.

“Advances in Coal Mining” in *The Coal Handbook: Towards Cleaner Production*, Elsevier, 2023.

Peer-Reviewed

Azam, S., Liu, S., Bhattacharyya, S., Liu, A., *Measurement and modeling of water vapor sorption on nano-sized coal particulates and its implication on its transport and deposition in the environment*. Science of The Total Environment 889: 164095, 2023.

Azam, S., et.al., *Comparative 6+ studies of environmentally persistent free radicals on nano-sized coal dusts.* Science of The Total Environment 878: 163163, 2023

Azam, S., et al., *Measurement and Modeling of Water Vapor Sorption on Nano-Sized Coal Particulates*. Available at SSRN 4329488, 2023.

Gendrue, N., Liu, S., Bhattacharyya, S., Clister, R., *An investigation of airflow distributions with booster fan for a large opening mine through field study and CFD modeling*, Tunneling and Underground Space Technology, 148, pp1048-56, 2023.

T. Young, J. Baka, Z. He, S. Bhattacharyya and Z. Lei, *Mining, loss, and despair: Exploring energy transitions and opioid use in an Appalachian coal community*, Energy Research & Social Science, 99, 2023.

Shao, H., et al. "Combustion Characteristics of Coal Dust Containing Oil in the Oxygen-enriched Environment." *Combustion Science and Technology* 194(6): 1213-1225, 2022.

Gendrue, N., et al. *Field survey of mine ventilation system for large opening underground mines: Pressure, relative humidity, and temperature*. Mine Ventilation, CRC Press: 489-497, 2021.

Wang, L., Xu, Y., Bhattacharyya, S., and Peng, X., *Coalbed methane stimulation by hydraulic punching with air cannon*, Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, Taylor and Francis, 2021.

Xu, Y., Wang, L., Bhattacharyya, S., Peng, X., and Chen, X., *Improving safety by further increasing the permeability of coal seams using air cannons after hydraulic punching*, Arabian Journal of Geosciences, Vol 14, Issue 20, Springer, 2021.

Shao, H., Lu, Q., Bhattacharyya, S., Jiang, S., *Combustion Characteristics of Coal Dust Containing Oil in the Oxygen-enriched Environment*, *Combustion Science and Technology*, 36: 523. <https://doi.org/10.1080/00102202.2020.1804887>, 2020.

Bhattacharyya, S., and F. Calizaya, *Performance of a New Fan Silencer Prototype*, “Mining Metallurgy & Exploration,” Springer publishing, 2019.

Bhattacharyya, S., A. C. Tripp, and R. L. McNearny. *Soil Moisture Effects on Temporal Subsidence Estimates Using InSAR*, International Journal of Surface Mining, Reclamation and Environ, 21(2): p 88-95, 2007.

In preparation and submission

Two papers for Applied Materials Today and Nature Communications with undisclosed titles. 2025.

Azam, S., Liu, S., Bhattacharyya, S., and Mishra, D.P., *Prevalence of Nano-sized coal mine dust in North and Central Appalachian coal mines – Insights from SEM-EDS Imaging*

Bhattacharyya, S., and Kumar, A.R., *Creating more effective training for competency in self-escape during mine emergencies.*

Azam, S., Liu, S., and Bhattacharyya, S., *CFD modeling of Transport Behavior of Nano-sized Particulates in Humid Underground Mine Environment*

Said, K.O., Dey, S., Bhattacharyya, S., and Kumar, A.R., *Development of a Control-Oriented Reduced-Order Mathematical Model for Underground Ventilation Systems.*

Bhattacharyya, S., and Kumar, A.R., *Building competency in self-escape during mine emergencies in modern mines.*

Conference Presentations, Preprints, and Industrial Publications

Zolata, H., Bhattacharyya, S., *Advances in software-as-a-service platforms to perform emission inventories for quantifying fugitive emissions and tracking efforts to reduce the dust footprint of extractive industries*, Mining Engineering, featured article, Dec 2022.

Bhattacharyya, S., *Coal in the Energy Mix: Resurgence or a Short-Lived Upsurge?* Steel Tech. Vol 17 Issue 3. 2023.

Bhattacharyya, S. (Co-Author), & Kumar, A. (December 2024). "Ensuring miner health and safety at the face – A design and regulate approach focused on respirable dust mitigation," Keynote Speech at Mine Ventilation and Environment for Green Mining (MVEGM) 2024, Indian Institute of Technology - Indian School of Mines, Puri, India, Accepted. International.

Omar, K., Kumar, A., Bhattacharyya, S. & Dey, S. (December 2024). "Computer Modeling of the Evolution of Combustion Products from Large-Format Lithium-Ion Batteries in Underground Mines," Mine Ventilation and Environment for Green Mining (MVEGM) 2024, Indian Institute of Technology - Indian School of Mines, Puri, India, Accepted. International.

Bhattacharyya, S. (Co-Author), & Azam, S. (December 2024). "Moisture-Induced Aggregation of Aerosols in Underground Mines – a Numerical Study," Mine Ventilation and

Environment for Green Mining (MVEGM) 2024, Indian Institute of Technology - Indian School of Mines, Puri, India, Accepted. International.

Bhattacharyya, S. (Author and Presenter), & Kumar, A. (October 2024). "Building competency in self-escape during mine emergencies in modern mines," Pittsburgh Coal Mining Institute of America (PCMIA) and SME Pittsburgh Chapter, SME (Society for Mining, Metallurgy & Exploration), Pittsburgh, PA, published in proceedings, Accepted. International.

Bhattacharyya, S. (Author and Presenter), & Kumar, A. (August 2024). "Creating more effective training for competency in self-escape during mine emergencies," 7th International Symposium on Mine Safety Science and Engineering, Pittsburgh.

Azam, S., Liu, S., Bhattacharyya, S., and Groves, W., *Measuring dust concentration using ELPI and its implication on nano-sized particulate sampling and characterization in the mining industry*, SME Annual Meeting, 2023, Denver, UT.

Hoebbel, S., Diamond, J., and Bhattacharyya, S. *Self-escape KSAs: A Case Study of CONSOL Energy's Enhanced Training Program - Realism and Mineworker Confidence*, Mining PA conference, 2023, University Park, PA.

Azam, S., Liu, S., Kurashov, V., Golbeck, J., Bhattacharyya, S., and Zhang, R., *Quantifying Environmentally Persistent Free Radicals (EPFRS) of Submicron Coal Dust*, SME Annual Meeting, 2022, Salt Lake City, UT.

Azam, S., and S. Bhattacharyya, *Evaluation of Ventilation Management Strategies as a Means to Control DPM exposure to Underground Mineworkers*, 18th North American Mine Ventilation Symposium, 2021, Rapid City, SD.

Gendrue, N., Liu, S., and Bhattacharyya, S., *Field Survey of Mine Ventilation System for Large Opening Underground Mines: Pressure, Relative Humidity and Temperature*, 18th North American Mine Ventilation Symposium, 2021, Rapid City, SD.

Bhattacharyya, S., and P. Rozelle, *Bridging the Domestic Supply-Demand Gap of Critical Materials Production*, SME (Society for Mining, Metallurgy & Exploration) Annual Meeting, 2020, Phoenix, AZ.

Agrawal, S., and S. Bhattacharyya, *Analyzing the Safety Performance of Coal Mining Industry in the United States Using Longitudinal Data Analysis Methods*, SME Annual Meeting, 2020, Phoenix, AZ.

Bhattacharyya, S., and F. Calizaya, *Auxiliary Ventilation Layouts for Noise Control in Underground Hard Rock Mines*, 17th North American Mine Ventilation Symposium, 2019, Montréal, Canada.

Calizaya, F., and S. Bhattacharyya, *Auxiliary Ventilation Layouts for Noise Control in Underground Coal Mines*, SME Annual Meeting, 2019, Denver, CO.

- Gendrue, N., Liu, S., Fan, L., & Bhattacharyya, S., *Gas Migration Behavior Near the Longwall Face: Experimental and Numerical Simulation Using PSU Scaled Mine Model*, SME Annual Conference, SME, 2019, Denver, CO.
- Calizaya, F., and S. Bhattacharyya, *Re-packable Silencers to Reduce Noise Levels Generated by Mine Fans*, NOISE-CON, 2018, Chicago, IL.
- Bhattacharyya, S., and F. Calizaya, *Testing the Performance of a New Fan Silencer Prototype for Auxiliary Ventilation*, SME Annual Meeting, 2018, Minneapolis, MN.
- Calizaya, F., and S. Bhattacharyya, *Improved Silencer Design Specifications for Representative Mine Conditions*, NOISE-CON, 2017, Grand Rapids, MI.
- Calizaya, F., and S. Bhattacharyya, *Attenuation of Noise from Auxiliary Ventilation in Underground Mines*, Mine Ventilation Symposium, 2017, Denver, CO.
- Bhattacharyya, S., and F. Calizaya, *Noise Attenuation of Auxiliary Fans and Reduction of Noise Exposure in Underground Mines*, NOISE-CON, 2016, Providence, RI.
- Bhattacharyya, S., and M. G. Nelson, *Ground Control Tools in Underground Coal Mines – Conveniences and Precautions - ARMPS*, SME Annual Meeting, 2016, Phoenix, AZ.
- Bhattacharyya, S., and F. Calizaya, *Reduction of Noise Exposure in Underground Mines by Improving Auxiliary Ventilation Technologies*, SME Annual Meeting, 2016, Phoenix, AZ.
- Bhattacharyya, S., and M. G. Nelson, *Ground Control Tools in Underground Coal Mines – Conveniences and Precautions*, Preprints, SME Annual Meeting, 2015, Denver, CO.
- Bhattacharyya, S., and M. G. Nelson, *Ground Control in a Western U.S. Coal Mine: Analysis using LAMODEL*, Preprints, SME Annual Conference, p 267-272, 2005, Salt Lake City, UT.

❖ **DIRECTED STUDENT LEARNING:**

- Sikandar Azam, Ph.D. Dissertation (August 2024).
- Sidharth Agrawal, Ph.D. Dissertation (August 2023).
- Nathan Gendrue, Doctoral Advisory Committee (August 2022). Master's Thesis (2019).
- Mark Hovingh, Master's Thesis (May 2023).
- Elham Rahimi, Ph.D. Comprehensive Committee (May 2023).
- Guijie Sang, Ph.D. Comprehensive Committee (May 2018).
- Cheryl Spellman, Doctoral Exam Committee (2023).
- Saboor Torabi, Master's Thesis (December 2023).
- Yun Yang, Ph.D. Committee (December 2020).

- Kunming Zhang, Ph.D. Committee (December 2024).
- I am currently a member of Ph.D. Committees of Ms. Khadija Omar and Mr. Xiaozhen Song.
- I served on the Ph.D. Committee of Dr. Long Fan and M.S. Committees of Mr. TJ Greene, and Ms. Joyce Masangu.
- I served EME qualifying examination committee in 2024 and candidacy exam of Ms. Keru Liu in 2018.
- As an undergraduate academic advisor, I used to advise all MNGE students in the EME department till 2021. Since that time, I advise about half of the students sharing the other half with another very capable faculty member.
- In addition to classroom teaching, I regularly organize field trips to mining operations, equipment manufacturing facilities, and safety research laboratories. These experiences expose students to industry best practices and broaden their understanding.
- I led a week-long, department-wide field camp in 2023, to various energy generation facilities.

❖ **ADMINISTRATIVE ACTIVITIES:**

Served as the Chair of the Mining Engineering (MNGE) Program at Penn State from 2019 through 2023. Responsibilities in this capacity included, inter alia.:

- Prepare teaching plans for the semesters and help the EME department head to assign teaching plans to faculty.
- Lead ABET accreditation process for the Mining Engineering Program
- Conduct MNGE faculty meetings and decide on important MNGE strategies.
- Lead collaborative efforts with international universities.
- Help MNGE faculty to collaborate with my past colleagues in the industry.
- Participated in revival of Penn State Associate Program at the Fayette Campus.
- Assign graders and TAs.
- Mentor new faculty and students.
- Maintain relationship with Industrial and Professional Advisory Council (IPAC), conduct meetings, and implement their recommendations.
- Curriculum revision for MNGE.
- Utilize endowments to award students.
- Form strategies for undergraduate student recruitment for MNGE and EME.
- Outreach for Fundraising, Internships, Fieldtrips, and Employment for students.
- Serve EME department's Executive Council.
- Serve faculty and staff hiring committees.
- Select EMS college 125th anniversary fellow selection for MNGE.
- Recommending students for external awards and for graduate school admission.
- Lead "EMEX" new students' program of the EMS college.

❖ **SERVICE ACTIVITIES (within and outside of the institution):**

Member of EMS college committees for non-tenure-line (NTL) faculty promotion.

Member of EMS college committees for graduate faculty nomination and approval.

Member of EME NTL faculty performance review committee

A lead organizer of EME undergraduate recruitment outreach activities including high school teachers conference in EME.

Academic Advisor of MNGE undergraduate students.

Associate Editor and Reviewer of MMEX Journal.

Reviewer of EME graduate student applications.

Reviewer of NIOSH (CDC) internal research proposals.

Reviewer of Ph.D. dissertations of some international universities.

Expert instructor of mine operations for undergraduate students at some high-ranking international universities.

SME (Society for Mining, Metallurgy & Exploration) involvements:

- Coal & Energy (C&E) Division - Executive Board Member and Member of Mine Improvement and Innovation Unit Committee.
- Member of PE (Professional Engineer) Examination Committee.
- Representative of Health and Safety Division to C&E Division and PE Examination Committee.
- Member of the advisory board for Mining Engineering magazine.
- Member of Ad-hoc committee for SME “Grants”

Reviewer of Int J of Coal Sc & Tech, Springer Env Sc ESPR, Elsevier, and others

Faculty Advisor, Penn State Mount Nittany Student Mine Rescue Team. Hosted a mine rescue contest at Penn State in State College in 2019.

Member (former) of EME Awards Committee.

I was the sole organizer of mine visits and field trips for Mining Engineering and some EME students.

Reviewer of the EME graduate admission applications

BSA (formerly Boy Scout of America) Merit Badge Counselor.

Judge (former) of PA State Level Science Fair, Harrisburg.

Judge (current) of high school and middle school TSA (Technology Student Associations) regional level.

❖ **INTERNATIONAL IMPACT AND INCLUSIVITY:**

- My peers in other universities and in the industry have often approached me to learn about mine operations, safety, and mining project evaluations.
- I teach “Introduction to Mining.” The course’s success has drawn attention from educational institutions worldwide seeking to integrate my resources, and the Vice President of the National Mining Association plans to feature the class on a national platform.

- I have delivered safety-related lectures at an iron ore mine of Tata Steel in India in 2018. I delivered mine operations related lecture to an exceptionally large class at the Indian Institute of Technology (IIT, Kharagpur) in 2020 and 2021. I discussed research collaborations with IIT (Kharagpur, and Mumbai), Indian School of Mines (ISM, Dhanbad), and with Kazakhstan government agencies. A memorandum of understanding is under preparation with ISM. I am working with Hindustan Copper Limited, India to jointly research better extraction from low grade ores. I am also working with Freeport McMoRan to study sustainability work in South American copper mines.
- Numerous journals invited me to serve as their reviewers and associate editors. I have accepted a few of these. In addition, the International Mine Ventilation Congress, Australia routinely uses my service as a peer reviewer.
- I reviewed dissertation of Ph.D. work for some ISM students as an external examiner.
- I maintain a very inclusive environment in my classroom and in my course contents. A large number of students in my courses, especially during 2017 - 2021, were from diverse and underrepresented populations. They became great supporters of my mission through the mine rescue training. Most of these students are now working successfully in the industry and at graduate schools of various national and international universities.

❖ **PROFESSIONAL DEVELOPMENT ACTIVITIES:**

- Total Professional Development Hours (PDH as required by NCEES) for Professional Engineers (PE)
 - 82.8 PDH in 2019
 - 24.5 PDH in 2020
 - 32.5 PDH in 2021
 - 28.0 PDH in 2022
 - 27.0 PDH in 2023
 - 26.0 PDH in 2024
- ABET Certification in *Fundamentals of Program Assessment* – October 2019
- Professional Development 5-day course in Economic Evaluations & Investment Decision Methods – June 2019
- Professional Development 3-day course in Project Management for Mining – March 2018
- More than 50 continuous improvement courses in Management, Diversity, Equity, and Inclusion, Supervision, and similar areas during 2017-2024.

(Supplemental information on experience and responsibilities)

PROFESSIONAL AND TEACHING RESPONSIBILITIES

All Employers with City/State Including U.S. Military (Most Recent First)	Work Performed: If Teacher, List Subjects Taught	Rank or Title	Dates
Penn State University Mining Engineering (MNGE) – ENERGY and Mineral Engineering (EME) University Park, PA	Research: Mine ventilation, health, and safety; Mine electrification using Lithium batteries; Opioid abuse in coal mining areas; Critical Minerals sourcing. Teach: MNG 230, MNG 410, MNG 497 (Geostat part), MNG 451W.EME 601. Service: Lead ABET Accreditation Process. Advised students and Mine Rescue Team, student recruitment effort, and field trips. Associate editor of journals, Executive roles in SME. Merit Badge Counselor in Boy Scout of America (BSA); Judges in State-level school events.	Associate Teaching Professor	August 2023 - Present
Penn State University University Park, PA	Research: Mine ventilation, health, and safety; Opioid abuse in coal mining areas; Critical Minerals sourcing. Teach: MNG 230, MNG 410, MNG 497 (Geostat part), MNG 451W, EME 601. Service: Lead MNGE program as the Chair. ABET Accreditation Process. Mine Rescue Team, Associate editor of journals, Executive roles in SME. Merit Badge Counselor in Boy Scout of America (BSA); Judges in State-level school events.	Chair & Associate Teaching Professor	November 2019 - July 2023
Penn State University University Park, PA	Research: Mine ventilation, health, and safety; Teach: MNG 412, MNG 512, MNG 497. Service: Lead MNGE student outreach, Mine Rescue team. ABET Accreditation Process. Associate editor of journals, Executive roles in SME.	Associate Professor	August 2017 - October 2019
New Mexico Tech Socorro, NM	Research: Mine ventilation, health, and safety; Teach: Surface and Underground mining systems; Mine Ventilation; Senior design. Service: Associate editor of journals, Executive roles in SME.	Associate Professor	September 2015 - July 2017
The University of Utah Salt Lake City, Utah	Research: Mine ventilation, health, and safety;	Visiting Faculty	January 2015 -

	Teach: Underground mining methods, and graduate level Longwall systems; Service: Associate editor of journals, Committee member roles in SME.		September 2015
Norwest Corporation (now Stantec) Salt Lake City, UT	Long term and medium term mine design and infrastructure planning; Prepare prefeasibility reports for the US and international mining companies.	Senior Mining Engineer	May 2013 - January 2015
Consol Energy Inc. Multiple locations in West Virginia and Pennsylvania	Short term mine design; Medium and long term mine infrastructure planning; Safety training; Lead crew to produce coal from underground coal mines.	Section Foreman and Mine Engineer	May 2009 - May 2013
Joy Global (presently Komatsu) Multiple locations in four States in India; Nottinghamshire, UK; Franklin, PA, USA.	Managed production, ground control, and contracts for four underground coal mines.	Manager Projects	December 2005 - July 2008
Calcutta Electric Supply Corp. Kolkata and Asansol in West Bengal, India	Long term mine planning; Plan supply chain for thermal power stations; Prefeasibility report for new surface coal mine for the World Bank funding.	Deputy Manager - Mining Project	July 1994 - August 2000

THE SCHOLARSHIP OF TEACHING AND LEARNING

List of Credit Courses Taught at Penn State for Each Semester with Enrollments in Each Course (excluding Thesis Preparation, Internship, Independent studies, or similar courses)

Semester/ Year	Course	Course Title	Credits	Enrollment	Instructor Role
Spring 2024	MNG 230 001V	Mining Engr	3	81	Primary Instructor
Spring 2024	MNG 230 001V	Mining Engr	3	1	Primary Instructor
Spring 2024	MNG 451W 001	Mng Eng Proj	2	4	Primary Instructor
Fall 2023	MNG 230 001	Mining Engr	3	63	Primary Instructor
Fall 2023	MNG 230 002V	Mining Engr	3	7	Primary Instructor
Fall 2023	MNG 230 002V	Mining Engr	3	11	Primary Instructor
Fall 2023	MNG 410 001	Underground Mining	3	4	Primary Instructor
Fall 2023	MNG 451W 001	Mng Eng Proj	2	4	Primary Instructor
Fall 2023	MNG 497 001	Special Topics	3	4	Primary

					Instructor
Spring 2023	MNG 230 001V	Mining Engr	3	68	Primary Instructor
Spring 2023	MNG 451W 001	Mng Eng Proj	2	4	Primary Instructor
Fall 2022	MNG 230 001	Mining Engr	3	23	Primary Instructor
Fall 2022	MNG 230 002V	Mining Engr	3	5	Primary Instructor
Fall 2022	MNG 410 001	Underground Mining	3	4	Primary Instructor
Fall 2022	MNG 451W 001	Mng Eng Proj	2	4	Primary Instructor
Fall 2022	MNG 497 00B	Special Topics	3	5	Primary Instructor
Spring 2022	MNG 230 001V	Mining Engr	3	1	Primary Instructor
Spring 2022	MNG 230 001V	Mining Engr	3	63	Primary Instructor
Spring 2022	MNG 451W 001	Mng Eng Proj	2	6	Primary Instructor
Fall 2021	MNG 410 001	Underground Mining	3	5	Primary Instructor
Fall 2021	MNG 412 001	Min Prop Eval	3	5	Primary Instructor
Fall 2021	MNG 451W 001	Mng Eng Proj	2	6	Primary Instructor
Spring 2021	MNG 230 001V	Mining Engr	3	36	Primary Instructor
Spring 2021	MNG 451W 001	Mng Eng Proj	2	11	Primary Instructor
Fall 2020	MNG 410 001	Underground Mining	3	11	Primary Instructor
Fall 2020	MNG 410 002	Underground Mining	3	1	Primary Instructor
Fall 2020	MNG 412 001	Min Prop Eval	3	5	Primary Instructor
Fall 2020	MNG 451W 001	Mng Eng Proj	2	10	Secondary Instructor
Fall 2020	MNG 451W 002	Mng Eng Proj	2	1	Primary Instructor
Spring 2020	MNG 230 001V	Mining Engr	3	24	Primary Instructor
Spring 2020	MNG 451 001	Mng Eng Proj	2	14	Primary Instructor
Fall 2019	MNG 412 001	Min Prop Eval	3	11	Primary Instructor
Fall 2019	MNG 451 001	Mng Eng Proj	2	14	Secondary Instructor
Spring 2019	MNG 451 001	Mng Eng Proj	2	19	Secondary Instructor
Spring 2019	MNG 497 001	Special Topics	3	9	Primary Instructor