CURRICULUM VITAE

BETHANY J KLEMETSRUD

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1. EDUCATIONAL BACKGROUND

PhD	Michigan Technological University, Chemical Engineering Dissertation: "*Theoretical and Experimental Investigation of Sustainable Fast Pyrolysis Biofuels from Woody Biomass"*	2016
BS	University of Minnesota Duluth, Chemical Engineering	2012

2. PROFESSIONAL EXPERIENCE

2019-present	Assistant Professor, Department of Chemical Engineering, University of North Dakota
2017-2019	Instructor, Department of Chemical Engineering, University of North Dakota
2017	Postdoctoral Scholar, Sustainable Futures Institute, Michigan Technological University

3. TEACHING EXPERIENCE

3.1 Regular Assignments

Course information is summarized in Tables 1 and 2. Table 1 lists information about the courses I have taught and co-taught at UND. Table 2 shows the student course evaluation scores taught since Fall 2017. The Department of Chemical Engineering uses student course evaluations as a tool to evaluate teaching performance of its faculty members. The department criteria is an average score for all questions of 4.0 or better (1= Strongly Disagree and 5 – Strongly Agree).

Table 1. Summary of Courses Taught at UND

Course	Title	Average Enrollment (On campus/Online)	Terms Taught
ChE 103	Computing Tools in Chemical Engineering	15/40	Springs 2020-2024
ChE 206	Unit Operations in Chemical Engineering	24/35	Springs 2018-present
ChE 232	Chemical Engineering Laboratory I	25	Spring 2018
ChE 235	Chemical Engineering Summer Laboratory I	28	Summer 2025 - present
ChE 331	Chemical Engineering Laboratory II	20	Falls 2017– present
ChE 332	Chemical Engineering Laboratory III	25	Spring 2018
ChE 335	Chemical Engineering Summer Laboratory II	19	Summers 2018-2023
ChE/ENGR 340	Professional Integrity in Engineering	41/48	2017–2021
ChE 420	Sustainability Capstone in Chemical Engineering	2	Spring 2023-Present
ChE 431	Chemical Engineering Laboratory IV	28	Fall 2017
Other Courses & Teaching Contributions			
ChE 380	Service Learning in Chemical Engineering	1	Fall 2019, 2023
ChE 412/413/414	Plant Design II: Process Project Engineering	Technical Advisor for 102 capstone design groups each year	Spring/Summers 2018-present

Table 2: Student Evaluations of Teaching – Fall 2017 – Spring 2024

Term	ChE 103	ChE 206	ChE 331	ChE 335	ENGR 340
Fall 2017					4.5/4.4*
Spr 2018		4.5/4.3*			4.4/4.5*
Sum 2018				4.9	4.6*
Fall 2018			4.5		4.6/4.4*
Spr 2019		4.7/4.5*			4.5/4.7*
Sum 2019				4.1	4.6*
Fall 2019			4.6		
Spr 2020	4.5/4.9*	4.3/4.7*			
Sum 2020				4.3*	4.7*
Fall 2020			4.6		
Spr 2021	4.9/4.3*	4.3/4.7*			
Sum 2021				4.6	4.5*
Fall 2021			4.3		
Spr 2022	4.7/4.2*	4.4/4.5*			
Sum 2022				4.2	
Fall 2022			4.1		
Spr 2023	4.9/4.7*	4.8/4.7*			
Sum 2023				4.9	
Fall 2023			4.5		
Spr 2024	4.5/4.9*	4.4/4.4*			
Fall 2024			4.7		
Spr 2025		4.5/4.6*			

*Average of all questions on SELFI, scores for each section, online sections are denoted with **

3.2 Student Advising

Ph.D. Research Advisor

Hall, K., 2024 – present, Chemical Engineering, UND
Olesik, J., 2023- present, Environmental Engineering, UND
Anyim, L., 2022 – present, Energy Engineering, UND (*co-advised)*
Lande, S., 2022 – 2025, Chemical Engineering, UND, withdrew May 2025
Litvanova, K., 2021 – present, Chemical Engineering, UND (*co-advised)*
Bram, L, 2021 – 2024, Environmental Engineering, UND. graduated December 2024

M.S. Research Advisor

Becker, E., 2025 – present, Chemical Engineering, UND
Hernandez, M., 2023- 2024, Chemical Engineering, graduated December 2024
Adebayo, I., 2023- present, Chemical Engineering, UND
Yeboah, F., 2023 – present, Chemical Engineering, UND
McKewan, W, 2021- 2022, Chemical Engineering, UND, withdrew November 2022
Meduna, Z., 2020-2022, Chemical Engineering, UND, graduated August 2022

Undergrad Research Advisor
Mata, P., (2025–present), Twaddle, M., (2025-present), Seemann R., (2022-2023), Ohrman T., (Su 2022), Monteith, L., (Su 2021)., Meduna, Z., (2020-21)., Anderson A., (Su 2020), Anderson B., (2019-2020), Hipslich, T., (2020), Berrara, B., (Su 2019), Muggli A., (Su 2019)

Undergraduate Academic Advising
Served as the academic advisor for 18+ undergraduate students per semester since Fall 2018.

3.3 Dissertations/Theses Directed
M.S. Theses
Hernandez, M. "Technoeconomic Analysis of Biogas Utilization in Refuse Power Plants", Chemical Engineering, UND, 2024
Meduna, Z. "Effects of Temperature and Feedstock Composition on Product Distribution of Mixed Plastic Waste Pyrolysis", Chemical Engineering, UND, 2022
Ph.D. Dissertations
Bram, L. "Evaluation of Socioeconomic Disparities from Coal Mining and Sustainable Remediation of Acid Mine Drainage Using Waste Carpet Tiles: A Geospatial and Life Cycle Assessment Approach", Environmental Engineering, UND, 2024

3.4 Other Graduate Committees
UND Graduate Advisory Committees (not chair/research advisor)
Essam., A., Ph.D., Chemical Engineering (May 2025 – present)
Adentunji, A., Ph.D., Chemical Engineering (September 2024 – present)
Robertson, J., Ph.D., Chemistry (June 2023 – December 2023)
Briana Miller, PhD, Education (June 2023- July 2024)
Caldwell, K, Ph.D., Education (June 2023 – August 2024)
Gholipur, M., Ph.D., Chemical Engineering (January 2022 -Present)
Bala, N., Ph.D, Chemistry (June 2021 – present)
Peske, E., M.S., Chemical Engineering (May 2021- present)
Johnson, E., M.S. Earth System Science Policy (September 2020- present)
Kohler, A., M.S. Chemical Engineering (June 2018 – August 2020)

3.5 Curriculum Development Activities
Course Development/Revisions
ChE 103 – Computing Tools in Chemical Engineering
- New course developed in Summer and Fall of 2019 and deployed Spring 2020
- Addressed lack of computing skills and confidence by incoming engineering students
- Worked with faculty within the department to develop problems that reflected the computing tools and content students would experience throughout the curricula

ChE 206, Unit Operations in Chemical Engineering
- Developed new homework and exam problems that reflected community and cultural connections of students within the course
- Created short concept videos and example problem videos to reemphasize concepts learned in-class.
- Developed new demos for Reynolds number and mixing times that are available to both on-campus and distance students

ChE (now ENGR) 340, Professional Integrity in Engineering
- Completely redesigned the course
- Emphasis on NSPE Code of Ethics and Engineering Ethics case studies
- Development of modules reflective of ethical issues students will see in the workplace
- Weekly case studies facilitated with in class discussions and online discussion forums for DEDP students

ChE 331/ChE 335, Chemical Engineering Laboratory II/Summer Laboratory II
- Developed a new fluid lab for the course
- Addition of scaffolded short writing assignments to improve writing skills within reports throughout the semester.

ChE 420, Sustainability Capstone in Chemical Engineering
- New course developed to teach students how to conduct life cycle assessments of their plant design process.
- Used key concepts of mass and energy balances from the Preliminary Design to perform a systematic way of thinking through sustainability at the local and global scales.

4. SERVICE

4.1 Department of Chemical Engineering Service
- PowerOn! and Outreach Coordinator, 2018 – present
- ChE Lab Coordinator, 2018 – present
- Computing & Software Coordinator, 2018-present
- Department Recruiting Tours – average of 1-2 students per semester, 2017 – present
- Instructor and Assistant Professor Search Committee, 2021, 2022

4.2 College of Engineering & Mines Service
- INDIgineering Program Coordinator, 2023 – present
- SWE Faculty Advisory, 2021 – present
- Jodsaas Center Board, 2018 – 2023
- DEI Committee 2019-2022
- E-Saturday – 2018 – present
- ND Science Fair Judge, 2018, 2019, 2021
- Engineering Week Outreach, 2018 – present
- STEM at the Library, 2021 – present
- Super Science Saturday, 2018, 2019

4.3 University Service
- Center for Engineering Education Research Center Leadership Team, 2022- present
- DEI Senate
- Native American Faculty Alliance, 2023 -present
- VPSA Search Committee, 2023
- GRAD Day Judge, 2018 – present
- AISES Advisor, 2018 – present
- DEI Committee, 2018-2020
- SSGID Facilitator, 2021 – present
- TimeOut Week Science Fair Organizer, 2019, 2020, 2024
- Wacipii Volunteer, 2018 – present

4.4 Professional Service

- Journal Reviewer for *"ACS Sustainable Chemistry and Engineering", "ACS Fuels", "Biofuels", "American Society for Engineering Education"*
- Proposal Reviewer for NSF EPSCoR Track 2
- Led Professional Development for Teachers using the Community Relevant Engineering Design (CRED) framework for the UND STEM conference in 2024 and the Pathways and Pages conference in 2025.

4.5 Community Service

- Native family outreach events with the Greater Grand Forks Unified American Indian Parent Committee

5. PUBLICATIONS/PERFORMANCES/EXHIBITS/EDUCATIONAL PRODUCTS

5.1 Juried/Refereed (student authors underlined)

1. Bram, L., Klemetsrud, B., "Life Cycle Assessment of Using Calcium Carbonate in Waste Flooring for Neutralization of Acid Mine Drainage: A Comparison Study", *Sustainable Chemistry for the Environment,* Submitted January 2025, In Review as of June 2025.
2. Adentunji, A., Olateru-Olagbegi, A., Bowman, F., Klemetsrud, B., Robinson, J., "Exploring Teachers' Lived Experiences with Culturally Relevant Engineering Design: An Instrumental Multiple Case Study," paper presented at 2025 ASEE Annual Conference, Montreal, Canada, June 2025
3. Litvanová, Kateřina, Bethany Klemetsrud, Feng Xiao, and Alena Kubátová. "Investigation of Real-Time Gaseous Thermal Decomposition Products of Representative Per-and Polyfluoroalkyl Substances (PFAS)." *Journal of the American Society for Mass Spectrometry* 36, no. 1 (2025): 108-118.
4. Bram., L., Klemetsrud, B., Vandeberg, G. (2024). Geospatial Analysis of the Socioeconomic and Demographic Effects of Historic Coal Mining in the Greater Pittsburgh Region, Pennsylvania, USA. *Spatial Demography,* 12(3)
5. Bowman, F., Klemetsrud, B., Ozturk, E., Robinson, J., Lacina, E., "Impact of Professional Development in Culturally Relevant Engineering Design for Elementary and Middle School Teachers," paper presented at 2024 ASEE Annual Conference, Portland, OR, June 2024.
6. Klemetsrud, B.J. and Bowman, F.M., "Work in Progress: Lessons Learned from Teaching Culturally Relevant Engineering Design in K–12 Classrooms and Applying Them to Undergraduate Engineering Courses," paper presented at 2023 ASEE Annual Conference, Baltimore, Maryland, June 2023.
7. Bram, L., & Klemetsrud, B. (2023). Calcium Carbonate in Waste Flooring for Neutralization of Acid Rock Drainage. *Mine Water and the Environment*,*42*(1), 70-77.
8. Bowman, F., Klemetsrud, B., Robinson, J., Ozturk, E., "Using Engineering Design Tasks to Create Indigenous Cultural and Community Connections with the Classroom for Elementary and Middle School Students," paper presented at 2022 ASEE Annual Conference, Minneapolis, Minnesota, June 2022.

9. Winjobi, O., Tavakoli, H., Klemetsrud, B., Handler, R., Marker, T., Roberts, M., & Shonnard, D. (2018). Carbon Footprint Analysis of Gasoline and Diesel from Forest Residues and Algae using Integrated Hydropyrolysis and Hydroconversion Plus Fischer–Tropsch (IH2 Plus cool GTL). *ACS Sustainable Chemistry & Engineering*,*6*(8), 10766-10777.
10. Ukaew, S., Schoenborn, J., Klemetsrud, B., & Shonnard, D. R. (2018). Effects of torrefaction temperature and acid pretreatment on the yield and quality of fast pyrolysis bio-oil from rice straw. *Journal of Analytical and Applied Pyrolysis*,*129*, 112-122.
11. Klemetsrud, B., Klinger, J., Ziv, E. B., & Shonnard, D. (2017). A kinetic study of the fast micro-pyrolysis of hybrid poplar. *Journal of Analytical and Applied Pyrolysis*, *128*, 353-362.
12. Klemetsrud, B., Eatherton, D. and Shonnard, D., (2017) Effects of Lignin Content and Temperature on the Properties of Hybrid Poplar Bio-Oil, Char, and Gas Obtained by Fast Pyrolysis. *Energy & Fuels*, *31*(3), pp.2879-2886
13. Klemetsrud, B., Ukaew, S., Shonnard, D., Thompson, V., Thompson, D., Klinger, J., Liu, L., Eatherton, D., Puengprasert, P., (2016) Characterization of Products from Fast Micro-Pyrolysis of Municipal Solid Waste (MSW), *ACS Sustainable Chemistry & Engineering*, 4(10), pp.5415-5423
14. Klinger, J., Klemetsrud, B., Bar-Ziv, E. and Shonnard, D., (2014) Temperature dependence of aspen torrefaction kinetics. *Journal of Analytical and Applied Pyrolysis*, *110*, pp.424-429.
15. Shonnard, D., Klemetsrud, B., Sacramento-Rivero, J., Navarro-Pineda, F., Hilbert, J., Handler, R., Supper, N., Donovan, R., (2015). An Analysis of Environmental Life Cycle Assessments of Liquid Transportation Biofuels in the Pan American Region. *Environmental Management*, December 2015, Volume 56, Issue 6, pp 1356–1376.

5.2 Non-Juried/Non-referred

1. Klemetsrud, B., (2021). "Life Cycle Assessment and Renewable Energy from an Indigenous Perspective," ND EPSCoR, https://education.ndepscor.nodak.edu/

5.3 Invited

Not Applicable

6. PROFESSIONAL PRESENTATIONS

6.1 National/International

1. Litvanova K.; Klemetsrud B., Xiao F., Kubatova, A.; Thermal Decomposition Products of Representative Per- and Poly-fluoroalkyl Substances (PFAS) Explored with Thermal Desorption and Pyrolysis Mass Spectrometry. 73rd ASMS Conference, June 2025, Baltimore, MD, poster
2. Zha, S., Chen., L.K., Hung, W., Gong, N., Moore, P., Klemetsrud, B., "Predicting Students' Interest from Small Group Conversational Characteristics: Insights from an AI Literacy Education with High School Students", SIGCSE TS 2025 (56th ACM Technical Symposium on Computer Science Education), Pittsburgh, PA., February 2025, poster

3. Essam, A., Hernandez, M., Anyim, L., Van der Watt, J., Klemetsrud, B.; "Biogas Utilization in Refuse Power Plants ($BURP^2$)". AIChE Annual Conference, San Diego, CA, October 2024, oral
4. Anyim, L., Van der Watt, J., Klemetsrud, B., "Life Cycle Assessment of Biogas Utilization in Refuse Power Plants", American Center for Life Cycle Assessment 2024 Conference, Snowbird, UT, September 2024, poster
5. Anyim, L., Hernandez, M., van der Waat, J., Kido, H., Klemetsrud. B., "Biogas Utilization in Refuse Power Plants", FECM/NETL Annual Review Meeting, Pittsburgh, PA, August 2024
6. Litvanova K.; Klemetsrud B., Xiao F., Kubatova, A.; Combination of Evolved Gas Analysis and Thermal Desorption – Pyrolysis – Gas Chromatography with Mass Spectrometry for Understanding Thermal Decomposition of PFAS. ACS Spring 2024, New Orleans, LA. March 2024, oral
7. Anyim, L., van der Waat, Kido, H., Klemetsrud, B., "Biogas Utilization in Refuse Power Plants", FECM/NETL Spring Review Meeting, Pittsburgh, PA, April 2023
8. Robinson, J., Bowman, F., Klemetsrud, B., Lacina, E., Ozturk, E., "Teachers' Culturally Relevant Engineering Self-Efficacy," 2022 STEM For All Video Showcase, May 10-17, 2022;https://stemforall2022.videohall.com/presentations/2293
9. Robinson, J., Bowman, F., Klemetsrud, B., "Increasing teachers' self-efficacy with Indigenizing engineering education: the development of a culturally relevant engineering design framework," 95th National Association for Research in Science Teaching (NARST) International Conference, Vancouver, BC, March 27-30, 2022.
10. Robinson, J., Bowman, F., Klemetsrud, B., Lacina, E., Ozturk, E., "Exploring Culturally- Relevant Engineering Education Design," 2021 STEM For All Video Showcase, May 11 18, 2021; https://stemforall2021.videohall.com/presentations/2035
11. Klemetsrud, B., Garcia, C., Vazquez, C., Eastmond, A., Pishke, E., Knowlton, J., Mata, E., Shonnard, DR., "Aspects of Sustainable Production of Palm Oil in the Municipality of Teapa in Tabasco, Mexico: Evaluating the Current and Future Use of Palm Oil" International Congress on Sustainability Science & Engineering, Cincinnati, OH, Summer 2018
12. Klemetsrud, B., Klinger, J. Bar Ziv E, Shonnard, D., "Kinetic Study of the Fast Micro-Pyrolysis of Hybrid Poplar" Annual Conference of the American Institute of Chemical Engineers, Minneapolis, MN, Fall 2017.
13. Klemetsrud, B., Garcia, C., Vazquez, C., Eastmond, A., Pishke, E., Knowlton, J., Mata, E., Shonnard, DR., "Aspects of Sustainable Production of Palm Oil in the Municipality of Teapa in Tabasco, Mexico: Evaluating the Current and Future Use of Palm Oil" Annual Conference of the American Institute of Chemical Engineers, Minneapolis, MN, Fall 2017.
14. Klemetsrud, B, Eatherton, D., Shonnard, D., "The Effect of Temperature and Lignin Content of Hybrid Poplar on the Properties of Hybrid Poplar Bio-Oil, Char and Gas via Fast Pyrolysis" Annual Conference of the American Institute of Chemical Engineers, San Francisco, CA, Fall 2017.
15. Klemetsrud, B, Klinger, J., Shonnard, D., "Effect of lignin content of hybrid poplar on the quality of fast pyrolysis bio-oil." Annual Conference of the American Institute of Chemical Engineers, Salt Lake City, UT, Fall 2016.

16. Thompson, V., Ray, A., Stevens, D., Daubaras, D., Hoover., A., Emerson, R., Ukaew, S., Klemetsrud, B., Klinger, Jk., Eatherton, D., Shonnard, D.,. "Assessment of Municipal Solid Waste for Biochemical and Thermochemical Conversion Pathways" Annual Conference of the American Institute of Chemical Engineers, Salt Lake City, UT, Fall 2016.
17. Klinger, J., Klemetsrud, B., Perelman, M., Bar-Ziv, E., Shonnard, D. "Effects of Torrefaction Severity on the Product Distribution of Two-Stage Pyrolysis." Annual Conference of the American Institute of Chemical Engineers, Atlanta, GA, Fall 2014.
18. Klemetsrud, B, Klinger, J., Steinhurst, A., Shonnard, D., Bar-Ziv, E. "Effect of Hybrid Poplar Lignin Content on Pyrolysis Bio-oil Properties." Annual Conference of the American Institute of Chemical Engineers, Atlanta, GA, Fall 2014.
19. Klemetsrud, B, Klinger, J., Shonnard, D., Meldrum, J., Bregni, L., Pellosma, T., Peterson, Z., Seitter, R., Vickers, E. "Use of a Pilot Scale Fluid Bed Pyrolysis Reactor in Undergraduate Engineering Education." Annual Conference of the American Institute of Chemical Engineers, Atlanta, GA, Fall 2014
20. Klemetsrud, B, Klinger, J., Bar-Ziv, E., Shonnard, D. "Enhanced Pyrolysis Oil Properties Through Pretreatment of Aspen with Controlled Torrefaction." RCN Pan-American Biofuels & Bioenergy Sustainability Conference, Recife, Brazil, Summer 2014.
21. Klinger, J., Klemetsrud, B., Bar-Ziv, E., Shonnard, D. "Temperature Dependence of Aspen Torrefaction Reaction Kinetics." Annual Conference of the American Institute of Chemical Engineers, San Francisco, CA, Fall 2013.
22. Klemetsrud, B, Klinger, J., Bar-Ziv, E., Shonnard, D. "Enhanced Pyrolysis Oil Properties Through Pretreatment of Aspen with Controlled Torrefaction." Annual Conference of the American Institute of Chemical Engineers, San Francisco, CA. Fall 2013.
23. Klinger, J., Klemetsrud, B., Shonnard, D., Mayer, A. "Sustainable Forest Based Biofuel Pathways to Hydrocarbon Transportations Fuels: Biomass Production, Torrefaction, Pyrolysis, Catalytic Upgrading and Combustion." Sustainable Energy Pathways Grantees Conference, Washington D.C., Summer 2013.

6.2 Regional

Not Applicable

6.3 State/Local

1. Litvanova, K., Kubatova, A., Klemetsrud, B.; "Kinetic study of pyrolyzed plastic waste". ACS Red River Valley Local Conference, February 2025 Grand Forks, ND, oral
2. Litvanova, K., Kubatova, A., Klemetsrud, B.; "Kinetic study of pyrolyzed plastic waste". Graduate Research Achievement Day. February 2025, Grand Forks, ND, poster
3. Yeboah, F., Seames, W., Klemetsrud, B.; "Assessing the feasibility and sustainability of wind and solar-powered water electrolysis for hydrogen fuel and oxygen production in Tribal Communities" Graduate Research Achievement Day. February 2025, Grand Forks, ND, poster
4. Singleton C., Seames, W., Klemetsrud, B.; "Assessing the feasibility for a community scale ethanol plant in Tribal Communities" Graduate Research Achievement Day. February 2025, Grand Forks, ND, poster

5. Anyim, L., Van der Waat, J., Klemetsrud, B.; "Life Cycle Assessment of Biogas Utilization in Refuse Power Plants" Graduate Research Achievement Day. February 2025, Grand Forks, ND, poster
6. Seames, W., Klemetsrud, B., Gladen A., Wu, H., "An Introduction to the NSF EPSCoR RII Track-2 Project: Sustainable Engineering Infrastructures and Solutions for Tribal Energy Sovereignty (TES)", ND EPSCoR Annual Conference, November 2024, Grand Forks, ND, oral
7. Singleton, C., Yeboah, F., Seames, W., Klemetsrud, B.; "Exploring the feasibility and sustainability of renewable energy technologies for Tribal Nations: A multi-case study approach" ND EPSCoR Annual Conference, November 2024, Grand Forks, ND, poster
8. Seames, W., Klemetsrud. B., Wu, H., and Gladen, A., "Sustainable Engineering Infrastructures and Solutions for Tribal Energy Sovereignty (TES)", National EPSCoR Conference, Oct 2024, Omaha, NE, oral
9. Yeboah, F., Seames, W., Klemetsrud, B.; "Exploring the feasibility and sustainability of biomass and waste-to-energy conversion technologies for tribal communities: a multi-case study approach" Graduate Research Achievement Day. March 2024, Grand Forks, ND, poster
10. Anyim, L., Van der Waat, J., Klemetsrud, B.; "Life Cycle Assessment of Biogas Co-firing with Carbon Capture and Storage" Graduate Research Achievement Day. March 2024, Grand Forks, ND, poster
11. Litvanova K., Kubatova, A., Klemetsrud B., Xiao F.; Gaseous Thermal Decomposition Products of Significant Per- and Polyfluoroalkyl Substances (PFAS) Investigated by an Innovative Analytical Method. GRAD 2024, University of North Dakota, Grand Forks, ND. March 2024, poster
12. Hernandez, M., Klemetsrud, B., Van der Waat, J.; "Technoeconomic Analysis on Biogas Utilization in Refuse Power Plants" Graduate Research Achievement Day. March 2024, Grand Forks, ND, poster
13. Litvanova, K., Kubatova, A., Klemetsrud. B., Xiao, F., "Investigating thermal destruction of per- and poly-fluoroalkyl substances (PFAS) by combining evolved gas analysis and thermal desorption – pyrolysis – gas chromatography and mass spectrometry", 2023 MCF Spring Symposium, June 2023, Minneapolis, MN
14. Klemetsrud, B., 'ASCE Ethics Case Study: Oil Transportation in Western North Dakota. Revisiting our Code of Ethics and Moral Theories", ASCE and NSPE State Meeting, April 2023, Grand Forks, ND
15. Lande, S., Klemetsrud, B., "Fast Pyrolysis of Plastic Wastes Using Fluidized Bed Reactor: Effect of Temperature and Feed-Mixture on the Product Distribution", UND GRAD day, March 2023, Poster
16. Litvanova, K., Kubatova, A., Klemetsrud. B., Xiao, F., "Pyrolysis: A solution to "Forever Chemicals", UND GRAD day, March 2023, poster
17. Anyim, L., Klemetsrud, B., van der Waats, J., "Baseline Life Cycle Analysis of Biogas Co-firing with Carbon Capture and Storage", UND GRAD day, March 2023, poster
18. Litvanova, K., Meduna, Z., Kubatova, A., Klemetsrud. B., Xiao, F. "Pyrolysis: A Solution for Plastic Waste and "Forever Chemicals", UND GRAD day, March 2022, poster

19. Litvanova, K., Kubatova, A., Klemetsrud. B., Xiao, F. "Thermal Decomposition and stability of anthropogenic waste", NDSU-KU Symposium, October 2022, poster
20. Meduna, Z., Kubatova, A., Klemetsrud, B., "Recycling your Recycling" 3MT, UND, January 2022
21. Klemetsrud, B., "Future Applications of Fast Pyrolysis and Life Cycle Assessment", Case Western Chemical Engineering Graduate Seminar, Spring 2021
22. Klemetsrud, B., "Kinetic Study of the Fast Micro-Pyrolysis of Hybrid Poplar and Future Applications" UND Chemistry Graduate Seminar, Fall 2020
23. Klemetsrud, B., "Kinetic Study of the Fast Micro-Pyrolysis of Hybrid Poplar and Future Applications" UND Chemical Engineering Graduate Seminar, Spring 2018
24. Klemetsrud, B, Klinger, J., Shonnard, D., "Effect of lignin content of hybrid poplar on the quality of fast pyrolysis bio-oil." Graduate Research Colloquium at Michigan Tech, Houghton, MI, Spring 2016.
25. Klemetsrud, B, Klinger, J., Steinhurst, A., Shonnard, D., Bar-Ziv, E. "Effect of Hybrid Poplar Lignin Content on Pyrolysis Bio-oil Properties." Graduate Research Colloquium at Michigan Tech, Houghton, MI, Spring 2015.
26. Klinger, J., Klemetsrud, B., Bar-Ziv, E., Shonnard, D. "Temperature Dependence of Aspen Torrefaction Reaction Kinetics." Annual Chemical Engineering Research Forum at Michigan Tech, Houghton, MI, Fall 2014.
27. Klemetsrud, B, Klinger, J., Bar-Ziv, E., Shonnard, D. "Enhanced Pyrolysis Oil Properties Through Pretreatment of Aspen with Controlled Torrefaction." Annual Chemical Engineering Research Forum at Michigan Tech, Houghton, MI, Fall 2014.
28. Klemetsrud, B, Klinger, J., Bar-Ziv, E., Shonnard, D. "Enhanced Pyrolysis Oil Properties Through Pretreatment of Aspen with Controlled Torrefaction." Graduate Research Colloquium at Michigan Tech, Houghton, MI, Fall 2014.

7. GRANTS AND CONTRACTS

7.1 Proposals Submitted

Table 3 summarizes the proposal I have submitted during my time here at UND. It includes proposals with a combined value of $43.4 million. Table 4 summarizes funded proposals since my hiring at UND with a combined value of $15.1 million.

Table 3: Summary of Proposals Submitted – September 2018 (initial hire date) to December 2023

Date Submitted	Title	Funding Agency	Role	Status	Amount Requested
Apr 2018	A System Dynamics Approach for Ensuring Sustainable Exports of Food and Energy in a Water-Constrained Environment	NSF	Partici-pant	Declined	$ 2,486,420.00
Sept 2019	Seed Funding for Preliminary LCA Data	CEM	PI	Funded	$ 6,250.00

Oct 2019	Frontier Lab's Multi-Shot Pyrolyzer EGA/PY-3030D to Promote Renewable Energy Research on Waste Materials at UND and ND Tribal Colleges	ND EPSCOR	PI	Funded	$40,000
Nov 2019	Exploring changes in elementary and middle school teachers' engineering design self-efficacy and practice through ongoing, collaborative, and culturally-relevant professional development	NSF	Co-PI	Funded	$ 449,971.00
Nov 2019	Building our capacity to conduct K-12 engineering education research, post-doctoral funding	UND VPRED	Co-PI	Funded	$ 140,000.00
Nov 2019	Carbon fingerprinting of Complex Matrices	UND VPRED	Partici-pant	Funded	$ 140,000.00
Nov 2019	Waste Conversion and Utilization for Renewable Alternatives for Fuels and Chemicals	UND VPRED	Co-PI	Declined	$ 140,000.00
Nov 2019	Lignin-Derived Cyclohexane Additives For Improved Jet Fuel Performance	DOE	Partici-pant	Funded	$ 4,868,248.00
Nov 2019	A thermochemical pathway: LC biomass to kerosene and by-product chemicals	DOE	Partici-pant	Declined	$2,490,000.00
May 2020	Development of a Reactive Adsorbent for CO2 Capture from Ambient Air	DOE	Partici-pant	Declined	$ 791,830.00
Sept 2020	Exploring the Conversion of Plastic Waste into Energy	ND EPSCOR	PI	Accepted	$ 5,000.00
Oct 2020	NSF INCLUDES Planning Grant: increasing the transfer rate of Native American STEM students from two-year to four-year educational institutions	NSF	Co-PI	Funded	$ 15,000.00
Nov 2020	Can Ethanol Damage Gasoline Engines?	ND Corn Council	Co-PI	Declined	$ 49,500.00
Nov 2020	The conversion of Stranded Ethane into Aviation Gasoline and Aromatics	NSF	Co-PI	Declined	$ 135,000.00
Dec 2020	The Center for Heterotrophic Algae Utilization Research (CHAUR)	NSF	Partici-pant	Declined	$ 1,833,000.00

June 2021	An Integrated Heterotrophic Microalgae System for Wastewater Treating and Biofuel Production	DOE	Partici-pant	Declined	$ 1,433,401.00
July 2021	CAREER: Valorization of Mixed Consumer Plastic Waste using a Multi-Stage Pyrolysis Reactor System	NSF	PI	Declined	$ 558,178.00
Dec 2021	Seed Funding for Preliminary Data for Kinetics of Plastic Waste Conversion via Pyrolysis	ND EPSCOR	PI	Funded	$ 14,000.00
Feb 2022	NSF 22-527 Planning Grant Creating pathways and enhancing STEM student outcomes: Enhancing partnerships between three Tribal Colleges and the University of North Dakota	NSF	PI	Declined	$99,935.00
Mar 2022	Sustainable High Rise Mass Timber in North Dakota	US Forest Service	Partici-pant	Declined	$500,001.00
April 2022	Process and Economic Model Integration For Flexible Nuclear Power Generation	DOE	Co-PI	Declined	$330,000.00
Apr 2022	A Dynamic Approach to Understanding the Drivers and Impacts of Energy Transitions in Underserved Communities	EPA	Partici-pant	Declined	$1,124,995.00
Apr 2022	Biogas Utilization in Refuse Power Plants (BURP2)	NETL	Co-PI	Funded	$400,000.00
July 2022	NSF Convergence Accelerator Track I: Sustainable Development of Renewable Polymers from Corn Stover	NSF	Partici-pant	Declined	$732,573.67
July 2022	CAREER: Determination of Kinetic Parameters and Secondary Interactions of Mixed Plastic Waste Pyrolysis	NSF	PI	Declined	$547,063.00
July 2022	Resource assessment of industrial wastes for CO2 mineralization	NETL	Partici-pant	Funded	$1,000,000.00
Aug 2022	iTEST: DTI: Cultivating STEM Career Interest in Middle School Students with Unmanned Aircraft Systems (UAS)	NSF	Co-PI	Declined	$1,299,644.00
Sep 2022	Sustainable Gas-to-Liquids Production Using the Sandwich Gasifier	DOE	Partici-pant	Declined	$861,249.00

Sep 2022	Retrofitting of a Bench Scale Pyrolysis Unit for Plastic and Forever Chemical Decomposition and Recycling	ND EPSCOR	PI	Declined	$15,000.00
Oct 2022	Cost Share for DOE Award to Convert Corn Stover Lignin to Jet Fuel	Corn Council	Partici-pant	Funded	$150,000.00
Nov 2022	Methane Splitting for Clean Hydrogen Production	NETL	Partici-pant	Declined	$1,500,000.00
Feb 2023	A Program on Sustainability and Entrepreneurship based around the Multidisciplinary and Project based Engineering Research for Advocating and Valorizing Waste Material Streams	EPA	Partici-pant	Pending	$1,087,820.00
May 2023	Smart Holistic Zero Waste Utilization Paradigm (SH0WUP) for reusing thermosets and effectively recovering fibers via mechanical, thermal, biological, and chemical pathways	DOE	Co-PI	Funded	$3,000,000.00
July 2023	Collaborative: RAPID: DRL AI: Integrating Culturally Relevant Project-based AI-integrated Learning (CRPAIL) in high-school STEM classes	NSF	Co-PI	Funded	$49,999.00
Sep 2022	Leveraging anaerobic ammonium oxidation for sustainable aquaculture	USDA	PI	Funded	$149,995.00
Jan 2023	RII Track-2 FEC: Sustainable Engineering Infrastructures and Solutions for Tribal Energy Sovereignty	NSF	Co-PI	Funded	$4,000,000.00
May 2023	NSF Global Centers Track 2: Energy Sovereignty for Indigenous Peoples (ESIP)	NSF	Co-PI	Funded	$249,998.00
Oct 2023	Cost Share for DOE Award to Convert Corn Stover Lignin to Jet Fuel	ND Corn Council	Partici-pant	Declined	$150,000.00
Nov 2023	Project ExCEED: Exploring collaborative professional development with grades 3 - 8 teachers to promote self-efficacy in culturally relevant engineering teaching	NSF	Co-PI	Declined	$2,771,599.00

Nov 2023	Investigation of the occurrence of per-fluorinated alkyl substance in plastics and sealants used in window manufacturing.	Marvin Windows	Co-PI	Declined	$38,946.00
Nov 2023	Exploring Novel Microalgae and Bacteriological Systems for the Production of Fuels and Chemicals	UND VPRED	Co-PI	Declined	$ 70,000.00
Jan 2024	IRES: Research to Support Energy Sovereignty for Indigenous Peoples	NSF	Co-PI	Funded	$450,000
Oct 2024	*CPER* Catalytic Approach for Reactive-Based Optimization of Non-Traditional Hydrocarbon Decomposition (CARBON-HD)	DOE	Partici-pant	Pending	$400,000
Oct 2024	AISES Indigenous Research Ecosystem	NSF	Co-PI	Pending	$3,000,000
Nov 2024	Project ExCEED: Exploring the impact of culturally relevant engineering design PD on teacher self-efficacy, pedagogical practice, and student learning behaviors	NSF	Co-PI	Pending	$2,999,914
Nov 2024	Research Infrastructure: MRI: Track 1 Acquisition of Pyrolysis-Gas Chromatograph with a High-Resolution Mass Spectrometer (Pyr-GC-HR-MS)	NSF	Partici-pant	Pending	$804,139

7.2 Funded Proposals

During my time at UND, I have received 13 funded research awards, totaling $15.1 million, with approximately $1.2 million allocated to support my research. A summary of these funded grants is provided in Table 4.

Date Submitted	Title	Funding Agency	Role	Status	Amount Requested
Sept 2019	Seed Funding for Preliminary LCA Data	CEM	PI	Funded	$ 6,250.00
Oct 2019	Frontier Lab's Multi-Shot Pyrolyzer EGA/PY-3030D to Promote Renewable Energy Research on Waste Materials at UND and ND Tribal Colleges	ND EPSCOR	PI	Funded	$40,000
Nov 2019	Exploring changes in elementary and middle school teachers' engineering design self-efficacy and practice through ongoing, collaborative, and culturally-relevant professional development	NSF	Co-PI	Funded	$ 449,971.00
Nov 2019	Building our capacity to conduct K-12 engineering education research, post-doctoral funding	UND VPRED	Co-PI	Funded	$ 140,000.00
Nov 2019	Carbon fingerprinting of Complex Matrices	UND VPRED	Co-PI	Funded	$ 140,000.00
Nov 2019	Lignin-Derived Cyclohexane Additives For Improved Jet Fuel Performance	DOE	Participant	Funded	$ 4,868,248.00
Oct 2020	NSF INCLUDES Planning Grant: increasing the transfer rate of Native American STEM students from two-year to four-year educational institutions	NSF	Co-PI	Funded	$ 15,000.00
Dec 2021	Seed Funding for Preliminary Data for Kinetics of Plastic Waste Conversion via Pyrolysis	ND EPSCOR	PI	Funded	$ 14,000.00

Date Submitted	Title	Funding Agency	Role	Status	Amount Requested
Apr 2022	Biogas Utilization in Refuse Power Plants (BURP2)	NETL	Co-PI	Funded	$400,000.00
July 2022	Resource assessment of industrial wastes for CO2 mineralization	NETL	Participant	Funded	$1,000,000.00
Oct 2022	Cost Share for DOE Award to Convert Corn Stover Lignin to Jet Fuel	Corn Council	Participant	Funded	$150,000.00
May 2023	Smart Holistic Zero Waste Utilization Paradigm (SH0WUP) for reusing thermosets and effectively recovering fibers via mechanical, thermal, biological, and chemical pathways	DOE	Co-PI	Funded	$3,000,000.00
July 2023	Collaborative: RAPID: DRL AI: Integrating Culturally Relevant Project-based AI-integrated Learning (CRPAIL) in high-school STEM classes	NSF	Co-PI	Funded	$49,999.00
Sep 2022	Leveraging anaerobic ammonium oxidation for sustainable aquaculture	USDA	PI	Funded	$149,995.00
Jan 2023	RII Track-2 FEC: Sustainable Engineering Infrastructures and Solutions for Tribal Energy Sovereignty	NSF	Co-PI	Funded	$4,000,000.00
May 2023	NSF Global Centers Track 2: Energy Sovereignty for Indigenous Peoples (ESIP)	NSF	Co-PI	Funded	$249,998.00
Jan 2024	IRES: Research to Support Energy Sovereignty for Indigenous Peoples	NSF	Co-PI	Funded	$450,000

8. PROFESSIONAL EDUCATION/CONSULTANT ACTIVITIES

Not applicable

9. HONORS AND AWARDS

- ASEE Best Paper Award Winner for the Pre-College Engineering Education Division, 2024
- UND Foundation Award for Departmental Excellence in Teaching, 2024
- CEM Dean's Outstanding Faculty Award, 2023
- CEM Outstanding Professor of the Year, 2023
- UND Outstanding Student Organization Advisor, 2023
- UND Foundation Award for Departmental Excellence in Research, 2020
- Tau Beta Pi Engineering Honor Society
- Omega Chi Epsilon, Chemical Engineering Honor Society