NICHOLAS A. BRAKE
Professor and Chair, Civil and Environmental Engineering Department
Lamar University, P.O. Box 10024, Beaumont, Texas 77710
Tel: (409) 880-8765, Fax: (409) 880-8121, E-mail: nbrake@lamar.edu

EDUCATION

- Ph.D. Civil Engineering, Michigan State University, East Lansing, Michigan. 2012
- M.S. Civil Engineering, Michigan State University, East Lansing, Michigan. 2008
- B.S. Civil Engineering, Michigan State University, East Lansing, Michigan. 2005

ACADEMIC WORK EXPERIENCE

- 2025-Current, Chair, Civil & Env. Eng. Dept., Lamar University, Beaumont, TX
- 2025– Current, Professor, Civil & Env. Eng. Dept., Lamar University, Beaumont, TX
- 2024-2025, Interim Chair, Civil & Env. Eng. Dept., Lamar University, Beaumont, TX
- 2018 – 2025, Associate Professor, Civil & Env. Eng. Dept., Lamar University, Beaumont, TX
- 2012 – 2018, Assistant Professor, Civil & Env. Eng. Dept., Lamar University, Beaumont, TX
- Jan. 2012 – Aug. 2012, Lecturer, CEE. Dept., Michigan State University, E. Lansing, MI
- 2006 –2011 Research Assistant, CEE Dept., Michigan State University, E. Lansing, MI
- 2005 –2006 UG Research Assistant, CEE Dept., Michigan State University, E. Lansing, MI

TEACHING

Teaching Experience

Michigan State University, East Lansing, MI, 2006-2012

- Course Instructor: CE 305 Intro to Structural Analysis
- Teaching Assistant/Lab Instructor: CE 221 Statics
- Teaching Assistant/Lab Instructor: CE 337 Civil Engineering Materials
- Teaching Assistant/Lab Instructor: CE 312 Soil Mechanics
- Teaching Assistant/Lab Instructor: EGR 101 Intro to Engineering
- Teaching Assistant/Lab Instructor: EGR 102 Intro to Engineering and Computational Analysis

Lamar University, Beaumont, Texas, 2012 – Current

Undergraduate Courses	Graduate Courses
• CVEN 1201 Introduction to Civil Engineering* • CVEN 2301 Statics • CVEN 2372 Mechanics of Solid • CVEN 3300 Engineering Material Systems** • CVEN 3340 Structural Analysis** • CVEN 4110 Professional Seminar (Ethics) • CVEN 4380 Reinforced Concrete Design I ** • CVEN 4390 Structural Steel Design** • ENGR 4301-11: Undergraduate Research • CVEN 4212/4313: Senior Design I and Senior Design II	• CVEN 5333 Advanced Pavement Analysis and Design*, ** • CVEN 5300 Advanced Structural Analysis** • CVEN 5311 Advanced Structural Dynamics*,**

*Developed course. Not offered by the Civil Engineering Department prior to my arrival.

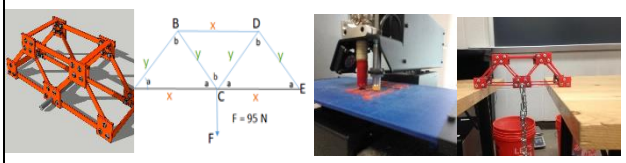
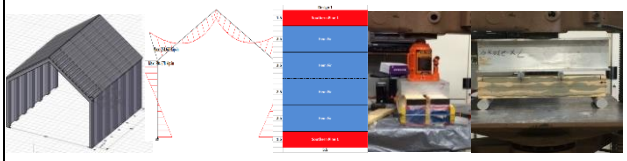
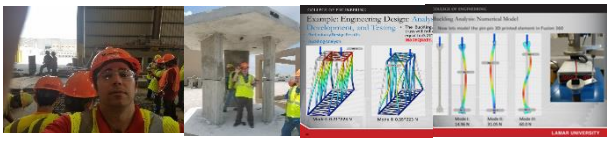
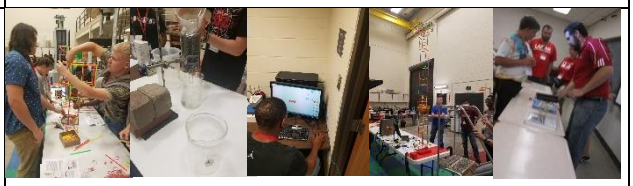
**Courses taught in the last two years

Awards

- Anita Riddle Excellence in Engineering Teaching Fellowship, 2018
- Lamar University Merit Award, 2018
- Texas Society of Professional Engineers (TSPE) Sabine Chapter Engineering Education Excellence Award, 2017
- Presidential Faculty Fellowship, Lamar University, 2015
- Outstanding Ph.D. Student Award, Michigan State University, 2012
- Outstanding Teaching Assistant Award, Michigan State University, 2011
- Travel Fellowship Award, Michigan State University, 2010
- College of Engineering Scholarship, Michigan State University, 2006
- Park-Deaver Scholarship, Michigan State University, 2003-2005

Teaching Methods

I conduct research in **engineering design education** and continuously collect quantitative and qualitative assessment data to measure student learning, design self-efficacy and effectiveness, and interest within courses I treat with pedagogical interventions. Students that have participated in the courses with the active learning design build project show significantly higher engineering design confidence and motivation at each academic level and shown to **perform better on their senior capstone design projects compared to a control population**. The intervention **Design-Build-Test** strategies that I have employed thus far have been wildly successful. I have collected quantitative survey data to assess the students' engineering design confidence at each undergraduate

FRESHMAN: CVEN 1201 Introduction to Civil Engineering: Students were introduced to Civil Engineering. Course included 5+ industry guest lectures, introduction to numerical analysis with engineering computational tools, and engineering design. Course implements active learning, project-based learning, **vertically integrated senior-freshman team-based learning, 3D printing-based design-build-test projects**. **Results: engineering interest increased ($p<0.05$), design confidence increased: ($p<0.005$), and design motivation increased ($p<0.1$).**	**Design** **Build** **Test** 
SOPHOMORE: CVEN 2301: Statics. Introduced a micro 3-week project-based learning **3D printing-based design-build-test project** in a traditional instructor-centered course. This was done to increase design confidence, teach students how to utilize three-dimensional cad in civil engineering applications, and taught students how to build a poster for oral presentation. **Results: engineering design confidence increased ($p<0.005$).**	
JUNIOR: CVEN 3200: Introduced a project-based learning design-build-test project that utilized realistic constraints and building codes. The engineering design process was emphasized. **Results: engineering design confidence design increased ($p<0.005$).** **BROADER IMPACT:** Students who completed the design-build-test sequence have been shown to **perform significantly better** on their senior capstone design project compared to a control population **($p<0.005$).**	
EXTRA-CURRICULAR ACTIVITIES: ASCE Concrete Canoe and Steel Bridge Team Technical Adviser. I served as the technical adviser to the ASCE student chapter since 2012. Students apply their engineering knowledge to solve problems with realistic constraints through project-based learning and design-build-test activities.	
K-12 EDUCATOR OUTREACH: As part of a National Science Foundation Project, we trained high school educators to integrate engineering design and manufacturing into the high-school curriculum. We visited manufacturing plants, conducted research, and developed teaching workshops.	
K-12 STUDENT OUTREACH: LITE and LITE Senior Summer Camp: I have been a part of the LITE Engineering Summer Camp for local middle and high school students at Lamar University for the past four years. After completing the camp, the students were found to have more interest in pursuing engineering careers.	

SERVICE

Professional Service

National Committee Memberships or Associations

- Member and Secretary, Transportation Research Board AKM60: Properties of Concrete and Constituent Material, 2013-2022
- Associate, Transportation Research Board AFN10: Basic Research and Emerging Technologies Related to Concrete
- Associate, Transportation Research Board AFN30: Durability of Concrete
- Associate, Transportation Research Board AFN40: Concrete Materials and Placement Techniques
- Associate, Transportation Research Board AFD50: Design and Rehabilitation of Concrete Pavements

National Professional Society Membership

- Member, Chi Epsilon
- Associate Member, American Society of Civil Engineers (ASCE)
- Member, American Society of Engineering Education (ASEE)
- Member, American Concrete Institute (ACI)
- Member, American Institute of Steel Construction (AISC)
- Member, Transportation Research Board (TRB)

Journal/Conference Paper Referee

- Reviewer, Sensors, MDPI
- Reviewer, Cement and Concrete Composites
- Reviewer, Journal of Cleaner Production
- Reviewer, Materials, MDPI
- Reviewer: Engineering Fracture Mechanics
- Reviewer: Construction and Building Materials
- Reviewer: Advances in Structural Engineering
- Reviewer: American Society of Engineering Education
- Reviewer: Transportation Research Record: AFN20: Properties of Concrete
- Reviewer: International Journal of Pavement Engineering
- Reviewer: ASCE Journal of Civil Engineering Materials
- Reviewer: Transportation Research Record: AFD50: Design and Rehabilitation of Concrete Pavements
- Reviewer: Road Materials and Pavement Design
- Reviewer: Transportation Research Record: AFN10: Basic Research and Emerging Technologies Related to Concrete
- Reviewer: ASCE Journal of Pavement Engineering

Service as a Commentator, Panelist, Discussant at Professional Meetings

- Local: Invited Speaker, Lamar University STEM Teacher Workshop, 2024
- National: Department of Energy UIFL Meetings, Breakout Moderator: Field Observations, 2023
- Local: Invited Speaker, Lamar University STEM Teacher Workshop: *"*Building Student Confidence and Motivation with Hands-on Engineering Design Projects," 2017
- National: Presiding Officer, Transportation Research Board Lectern Session: Properties of Concrete: Testing and Specifications, Washington, D.C., 2017
- Local: Panelist, LU STEM Teacher's Workshop, Beaumont, TX., June 2016
- National: Presiding Officer and Moderator, Transportation Research Board Workshop: Use of Sensors in Highway Concrete Applications, Washington, D.C., 2016

University Service

Lamar University, Beaumont, Texas, Aug. 2012 – Current

Lamar University

- Lamar University Office of Undergraduate Research Advisory Council 2023-2025
- Lamar University Strategic Planning Committee Member, 2019-2022
- Faculty Student Success Committee, 2018-2020
  - First Year Experience Subcommittee
- Quality Enhancement Program (QEP) College of Engineering Representative, 2017-2022
  - QEP Marketing Committee, 2017-2018
  - QEP Literature Review Committee, 2017-2022
- Faculty Senate Member, 2016-2018
  - Chair, Faculty Senate Development Leave Committee, 2017
  - Faculty Senate Development Leave Committee Member, 2016-2018
  - Faculty Senate Executive Committee Member, 2017-2018
- Lamar University Undergraduate Exposition Panel Reviewer, 2017
- Lamar University SURF Proposal Reviewer, 2017
- Panel moderator, Lamar University Undergraduate Research Conference, 2016

Civil and Environmental Engineering Department

- Faculty Advisor, American Society of Civil Engineers student chapter, 2025-Present
- Faculty Advisor, Society of Hispanic Engineers student chapter, 2019-2024
- Faculty Advisor, American Society of Civil Engineers student chapter, 2019-2022
- SACS and ABET Coordinator, Civil and Environmental Engineering Dept., 2017-2024
- Chair, CEE Undergraduate Curriculum Committee, 2017-2022
- CEE Department Chair Search Committee Member, 2022
- Recruiting Coordinator, Civil Engineering recruiting/open house: Cardinal View, 2012-2016
- CEE Department Chair Search Committee Member, 2016
- Chair, CEE Visiting Professor search committee, 2015

College of Engineering

- College of Engineering F2.08 Faculty Evaluation Committee, 2018
- C.O.E. Dean search committee member, 2014-2015
- Research and Teaching Laboratory Safety Committee, 2015
- BSIT Transfer and Retention Committee, 2016
- Civil Engineering LITE Engineering Summer Camp Coordinator, 2014-2016
- Faculty Adviser, Engineers Without Borders, 2013-2015

Community Service

- Supervisory Board Member -- Education First Federal Credit Union
- West End Little League Baseball Coach – 2023-2025
- Nederland Little Dribblers Basketball Coach – 2023-2025
- K12 Outreach, Lamar State College Port Arthur – Texas Southern University: National Summer Transportation Institute, Guest Speaker, 2015-2021

RESEARCH

Refereed Journal Publications

1. Feizbahr, M., **Brake, N.,** Arbabkhah, H., Hariri Asli, H., & Woods, K. (2025). Flood Susceptibility Mapping Using Machine Learning and Geospatial-Sentinel-1 SAR Integration for Enhanced Early Warning Systems. Remote Sensing, 17(20), 3471. https://doi.org/10.3390/rs17203471
2. Asli, H. H., **Brake, N.A,** Feizbahr, M., Bakhrel, U., Arbabkhah, H., & Jahangir, M. S. (2025). Pavement condition and climatic data in southeast Texas: A dataset for evaluating flood impacts on pavement performance. Data in Brief, 111914.
3. Adesina, M., **Brake, N.A,** & Asli, H. H. (2025). A survey of flood warning sensor network operational and maintenance practices across the United States. *Developments in the Built Environment*, 100689.
4. Adesina, M., **Brake, N.A.,** Haselbach, L., Asli, H.H. (2024). Interagency deployment of a shared low-cost flood monitoring system to improve flood resilience across southeast Texas: A Case Study. *Journal of Flood Risk Management*, e12940. https://doi.org/10.1111/jfr3.12940
5. Rabbanifar, S., Nguyen, T. T. M., Qian, Q., **Brake, N. A.,** Kibodeaux, K., Crochet, H. E., ... & Jao, M. (2023). Reusing Dredged Material through Stabilization with So-Called Bio-Enzyme Products. Buildings, 13(10), 2618.
6. Nikookar, M., **Brake, N. A.,** Asli, H. H., Adesina, M., Rahman, A., Selvaratnam, T., & Bradley, R. K. (2023). Durability, workability, and setting time of cementitious systems containing chloride-rich oil and gas production wastewater. *Construction and Building Materials,* 403, 132862.
7. Asli, H. H., **Brake, N.A.,** Kruger, J., Haselbach, L., & Adesina, M. (2023). Field surveying data of low-cost networked flood sensors in southeast Texas. *Data in Brief,* 50, 109504.

8. Nikookar, M., **Brake, N. A.,** Adesina, M., Rahman, A., & Selvaratnam, T. (2023). Past, current, and future re-use of recycled non-potable water sources in concrete applications to reduce freshwater consumption-A Review. *Cleaner Materials*, 100203.
9. Oruji, S., **Brake, N. A.,** Hosseini, S., Adesina, M., & Nikookar, M. (2023). Enhancing Recycled Aggregate Concrete Using a Three-Stage Mixed Coal Bottom Ash Slurry Coating. *Journal of Materials in Civil Engineering*, 35(5), 04023061.
10. Nikookar, M., **Brake, N. A.,** Adesina, M., Rahman, A., Selvaratnam, T., Snyder, H. A., & Günaydın-Sen, O. (2022). Reutilization of oil and gas produced water in cement composite manufacturing. *Journal of Cleaner Production*, 381, 135113.
11. Hosseini, S., **Brake, N.A.,** Nikookar, M., Günaydın-Şen, Ö. and Snyder, H.A., (2021). Enhanced strength and microstructure of dredged clay sediment-fly ash geopolymer by mechanochemical activation. *Construction and Building Materials*, *301*, p.123984.
12. Hosseini, S., **Brake, N. A.,** Nikookar, M., Günaydın-Şen, Ö., & Snyder, H. A. (2021). Mechanochemically activated bottom ash-fly ash geopolymer. *Cement and Concrete Composites*, 118, 103976.
13. Edwards, K. A., Al-Abed, S. H., Hosseini, S., & **Brake, N. A.** (2019). Properties of a magnetic concrete core transformer for application in wireless power transfer systems. *Construction and Building Materials*, 227, 117041.
14. Naddaf-Sh, M. M., Hosseini, S., Zhang, J., **Brake, N. A.,** & Zargarzadeh, H. (2019). Real-time road crack mapping using an optimized convolutional neural network. Complexity, 2019, 1-17.
15. Oruji, S., **Brake, N.A.,** Guduru, R.K., Nalluri, L., Günaydın-Şen, Ö., Kharel, K., Rabbanifar, S., Hosseini, S. and Ingram, E., (2019). Mitigation of ASR expansion in concrete using ultra-fine coal bottom ash. *Construction and Building Materials*, *202*, pp.814-824.
16. Weihang Zhu, Xuejun Fan, **Nicholas Brake**, Xinyu Liu, Xianchang Li, Jiang Zhou, Dorothy Sisk, Julia Yoo. (2018). Engineering Design and Manufacturing Education through Research Experience for High School Teachers, *Procedia Manufacturing,* 26, pp. 1340-1348
17. T. Thuy Minh Nguyen, Saeed Rabbanifar, **Nicholas Brake**, Qin Qian; Kyle Kibodeaux; Harold E. Crochet, B.S.; Soheil Oruji, M.S.; Remington Whitt; Joshua Farrow; Brandon Belaire; Paul Bernazzani; Mien Jao. (2018). Stabilization of Silty Clayey Dredged Material. *ASCE J. Mat. Civ. Eng.,* 30(9), 04018199, DOI: 10.1061/(ASCE)MT.1943-5533.0002391
18. **Brake, Nicholas, A.,** Jao, Mien, Su, Dan. (2018). The integration of micro Design-Build-Test projects in instructor-centered courses to increase engineering design confidence. *ASCE J. Prof. Issues Eng. Educ. Pract.*, 144(2): 05018002
19. **Brake, Nicholas, A.,** Chatti, Karim, Albana, Ali. (2018). Fatigue crack resistance characterization of fully supported plain concrete beams. *Road Materials and Pavement Design*, DOI: 10.1080/14680629.2018.1418676
20. Mahmud, Mohammad H., Elmahmoud, Weam, Barzegaran, M.R., **Brake, Nicholas, A.** (2017). Efficient Wireless Power Charging of Electric Vehicle by modifying the magnetic characteristics of the medium. DOI 10.1109/TMAG.2017.2654164, *IEEE Transactions on Magnetics*
21. Oruji, Soheil, **Brake, Nicholas, A.**, Nalluri, Likhith, Guduru, Ramesh. (2017). Strength activity and microstructure of blended ultra-fine coal bottom ash-cement mortar. *Construction and Building Materials*, 153, 317-326

22. **Brake, Nicholas A.**, Chatti, Karim. (2016). Equivalent crack, fracture size effect, and cohesive stress zone of plain concrete under quasi-static and variable high-cycle fatigue loading, *ASCE J. Mat. Civ. Eng.,* DOI: 10.161/(ASCE)MT.1943-5533.0001766
23. **Brake, Nicholas, A.,** Allahdadi, Hamid., Adam, Fatih., (2016). Flexural strength and fracture size effects of pervious concrete. *Construction and Building Materials,* 113, 536-543.
24. Thang, Vul, Marshall, P., **Brake, Nicholas A.** (2016). Studded Bond Enhancement for SCS sandwich shells*, Ocean Engineering*, 32-41, 124.
25. Sudani, Ghassan A., **Brake, Nicholas. A.,** Jao, Mien. (2015). Stability of Footings Adjacent to Pile-Walls, *ASCE International Journal of Geomechanics*, 15(6).
26. **Brake, Nicholas A.**, Chatti, Karim. (2013). Prediction of size effect and non-linear crack growth in plain concrete under fatigue loading*, Engineering Fracture Mechanics*, 109, 169-185.
27. **Brake, Nicholas A.**, Chatti, Karim. (2012). Prediction of transient and steady state flexural fatigue crack propagation in concrete using a cyclic R-curve*, ASCE J. Eng. Mech*. 138(4), 371-378.

Refereed Conference Proceedings

1. Hossein H Asli, **Nicholas A Brake**, et al., Spatial Hotspot Analysis of Urban Pavement Deterioration in a Flood-Prone Network: A Case Study of Beaumont, Texas, Transportation Research Board, January 2026
2. Almeida, N., Hosseini, S., **Brake, N.A**., Haselbach, L. Time Impacts of NaHCO3 Pervious Concrete Treatment: An ITZ Analysis Through Nanoindentation Tests (2024), In ASCE Transportation and Development Conference , Atlanta, Georgia, June 15-18, 2024
3. **Brake, Nicholas A.,** Sehin, O., Partain, J.W., Valles, D., Marquez, A., Jimenez, J.A., Saltsman, G., Davis, R. (2020). Cross-cultural engineering skill development at an international engineering summer boot camp. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
4. **Brake, Nicholas A.,** Selvaratnam, T. (2020). Peer Mentorship and a 3D Printed Design-Build-Test Project: Enhancing the First Year Civil Engineering Experience. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
5. Liu, X., Fan, X., Zhou, J., **Brake, Nicholas, A.,** Li, X., Yoo, J., Sisk, D. (2020). Application of 3D CAD and 3D Printing to RET Program to Enrich Engineering Design Education. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
6. Zhu, W., Fan, X., **Brake, Nicholas A.,** Liu, X., Li, X., Zhou, J., Sisk, D., Yoo, J. (2018). First Year Experience from RET Site: Incorporating Engineering Design and Manufacturing into High School Curriculum, In *American Society of Engineering Education*, Salt Lake City, UT., June 24-27.
7. Edwards, Kyle A. T., **Brake, Nicholas A.,** (2018). Increasing Concrete Magnetic Permeability with the Addition of Soft Iron and Stainless Steel Fiber Inclusions. In *International Conference on Transportation and Development: Planning, Sustainability, and Infrastructure Systems*, 345-352, Pittsburgh, PA, July 15-18
8. **Brake, Nicholas A.,** Oruji, S., Haselbach, L. (2018). Increasing compressive strength of recycled aggregate concrete using high fineness bottom ash blended cement. In *International*

Conference on Transportation and Development: Airfield and Highway Pavements, 401-410 Pittsburgh, PA, July 15-18

9. Soheil Oruji, **Nicholas A. Brake**, Ramesh K. Guduru, Clayton Jeffryes, Likhith Nalluri, Shishir Kumar, Adarsh Bafana, Hayden Rice (2018). Dispersed ultra-fine bottom ash blended mortar. In *Proceedings of the Transportation Research Board*.
10. Zhu, Weihang, Yoo, Julia, Curry, James, Zhou, Jiang, Chu, Hsing-wei, **Brake, Nicholas, A.** (2017). Industrial and Mechanical Engineering Scholars with Scholarships, Career Mentoring, Outreach and Advisement, Professional Societies and Engineering Learning Community (SCOPE) S-STEM Program, S-STEM Program Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, Ohio. https://peer.asee.org/27790
11. **Brake, Nicholas A.**, Curry, James. (2016). The impact of a one-credit introductory engineering course on engineering self-efficacy: seminar v. project-based. In *American Society of Engineering Education*, New Orleans, June 26-28.
12. **Brake, Nicholas A.** (2016). A pre-capstone junior-level structural and materials design project for civil engineering students: glue laminated timber design, In *American Society of Engineering Education*, New Orleans, June 26-28.
13. **Brake, Nicholas A.**, Adam, Fatih. (2016). Integrating a 3D printer and a truss optimization project in Statics, In *American Society of Engineering Education*, New Orleans, June 26-28.
14. **Brake, Nicholas A.**, Chatti, Karim. (2016). Characterizing non-linear fatigue crack growth and size effect in plain concrete beams with a hybrid effective crack and cohesive zone model. In *RILEM: 8th International Conference on Pavement Cracking*, Nantes, France. June 7-9.
15. **Brake, Nicholas A.**, Allahdadi, Hamid., Adam, Fatih, Carillo, Nicholas., Mason, Murphy. (2015). Residual strength of pervious concrete under static and impact loading, In *Airfield and Highway Pavement Conference*. Miami, FL. June 7-10.
16. Thang, Vul, Marshall, Peter W., **Brake, Nicholas. A.,** (2014). Bond Enhancement in Curved Sandwich Shells. In *International Conference and Exhibition on Performance of Ships and Structures in Ice,* Banff, Alberta, Canada. July 28-31.
17. **Brake, Nicholas A.**, Adam, Fatih. (2013). Accelerated fatigue damage of a rigid pavement overlying a sub-surface void: a computational analysis, In *Proceedings of the Transportation Research Board*.
18. **Brake, Nicholas A.**, Chatti, Karim. (2012). The effect of non-linear damage accumulation on fatigue cracking predictions in concrete pavements, In *Proceedings of the Transportation Research Board*.
19. **Brake, Nicholas A.**, Chatti, Karim. (2012). *Plain concrete cyclic crack resistance curves under constant and variable amplitude loading*, In *RILEM, 7th International Conference on Pavement Cracking,* Delft, The Netherlands, June 20-22.
20. **Brake, Nicholas A.**, Chatti, Karim. (2012). Evaluation of the linear damage assumption in JPCP bottom-up fatigue cracking. In *10th International Conference on Concrete Pavements,* Quebec City, Canada. July 8-12.
21. Chatti, Karim, Manik, A., **Brake, Nicholas A.** (2008). Effect of axle configurations on fatigue and faulting of concrete pavements, In *10th International Symposium on Heavy Vehicle Transport Technology*, Paris, France.
22. Chatti, Karim, **Brake, Nicholas A.**, Salama, Hassan, Haider, S.W. (2008). *The effect of different axle configurations on the fatigue life of plain cement concrete*, RILEM, 6th International Conference on Pavement Cracking, Chicago, Illinois. June 16-18.

Conference Proceeding Presentations

1. **Brake, Nicholas, A.,** Qian, Qin. Building Community Resilience through Rainfall, Water Depth, Water Quality Data Monitoring, and Coastal Marsh Biogeochemical Services, Department of Energy UIFL Annual Meeting, 9/2023
2. **Brake, Nicholas A.,** Sehin, O., Partain, J.W., Valles, D., Marquez, A., Jimenez, J.A., Saltsman, G., Davis, R. (2020). Cross-cultural engineering skill development at an international engineering summer boot camp. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
3. **Brake, Nicholas A.,** Selvaratnam, T. (2020). Peer Mentorship and a 3D Printed Design-Build-Test Project: Enhancing the First Year Civil Engineering Experience. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
4. Liu, X., Fan, X., Zhou, J., **Brake, Nicholas, A.,** Li, X., Yoo, J., Sisk, D. (2020). Application of 3D CAD and 3D Printing to RET Program to Enrich Engineering Design Education. In *American Society of Engineering Education*, Montreal, Canada., June 21-24.
5. **Brake, Nicholas A.**, Curry, James. (2016). The impact of a one-credit introductory engineering course on engineering self-efficacy: seminar v. project-based. In *American Society of Engineering Education*, New Orleans, June 26-28.
6. **Brake, Nicholas A.** (2016). A pre-capstone junior-level structural and materials design project for civil engineering students: glue laminated timber design, In *American Society of Engineering Education*, New Orleans, June 26-28.
7. **Brake, Nicholas A.**, Adam, Fatih. (2016). Integrating a 3D printer and a truss optimization project in Statics, In *American Society of Engineering Education*, New Orleans, June 26-28.
8. **Brake, Nicholas A.**, Allahdadi, Hamid., Adam, Fatih, Carillo, Nicholas., Mason, Murphy. (2015). Residual strength of pervious concrete under static and impact loading, In *Airfield and Highway Pavement Conference*. Miami, FL. June 7-10.
9. **Brake, Nicholas A.**, Adam, Fatih. (2013). Accelerated fatigue damage of a rigid pavement overlying a sub-surface void: a computational analysis, In *Proceedings of the Transportation Research Board*.
10. **Brake, Nicholas A.**, Chatti, Karim. (2012). The effect of non-linear damage accumulation on fatigue cracking predictions in concrete pavements, In *Proceedings of the Transportation Research Board*.
11. **Brake, Nicholas A.**, Chatti, Karim. (2012). Evaluation of the linear damage assumption in JPCP bottom-up fatigue cracking. In *10th International Conference on Concrete Pavements,* Quebec City, Canada. July 8-12.

Professional Reports

1. Chatti, Karim., Manik, Anshu., Salama, Hassan., Haider, Syed.W., **Brake, Nicholas A.**, El Mohtar, Chadi. (2009). "Effect of Michigan Multi-Axle Trucks on Pavement Distress", MDOT Report # RC-1504, Lansing, Michigan

Dissertation/Thesis Supervision

1. Shishir Bhusal, M.S. Thesis
2. Mahdi Feizbahr, D.E. Dissertation: Fall 2026

3. Hossein Hariri Asli, D.E. Dissertation: "Optimizing pavement performance prediction using data-driven methods: Integrating structural, environmental, maintenance, and flood-related factors in Beaumont, Texas", Summer 2025
4. Unique Bhakrel, M.S. Thesis: Fall 2024
5. Mubarak Adesina, D.E. Dissertation: "Deployment and Operation of a Regional Interagency Low-Cost Flood Sensor Network: A Case Study of Southeast Texas", 2024
6. Arun Kshetri, M.S. Thesis: "Development of a flood library at flood sensor sites in Southeast Texas and West Louisiana using base level engineering approach", 2023
7. Mohammad Nikookar, D.E. Dissertation: "Reutilization of oil and gas produced water as a replacement for traditional mixing water within the cementitious system", 2022
8. Paymon Safi, M.S. Thesis: "Combined use of natural zeolite and bottom ash to enhance mortar hydration and compressive strength in cementitious systems containing recycled produced water", 2022
9. Shova Ram Bhattarai, M.S. Thesis: "Combined use of bottom ash and natural zeolite to improve the durability of portland cement mortars containing produced water", 2022
10. Seyedsaied Hosseini, D.E. Dissertation: "Mechanochemical Treatment of Bottom Ash and Dredge Materials in Fly Ash Based Geopolymer", 2020
11. Suhaib Al Abed, M.S. Thesis: "Properties of Magnetic Concrete for Wireless Power Charging Applications."
12. Kyle Edwards, M.S. Thesis: "Developing a magnetically permeable cement mortar for embedded wireless charging infrastructure", December 2018
13. Soheil Oruji, D.E. Dissertation: "Replacing ultra-fine and highly dispersed pulverized coal bottom ash as portland cement to strengthen and improve physical properties of cement mortars". December 2017
14. Weam Elmahmoud, M.S. Thesis: "Experimental analysis of fine impregnated electrically conductive powders in Portland cement". December 2016
15. Fatih Adam, D.E. Dissertation: "Structural Analysis of a rigid pavement overlaying a sub-surface void", December 2015
16. Samson Negeri, M.S. Thesis: "The effects of heavy multiple axle trucks on rigid pavement distress in various climatic regions", May 2014
17. Vul Thang, M.S. Thesis: "Studded bond enhancement for SCS sandwich shells", August 2014
18. Ali Banaa, M.S. Thesis: "Early age damage quantification of actively restrained concrete using inverse analysis", December 2014
19. Sina Nejad, D.E. Dissertation: "Protection of petrochemical facilities from accidental and manmade threats", December 2014
20. Ghassan Sudani, D.E. Dissertation: "Stability of shallow foundations adjacent to spaced piles-row", 2013

Undergraduate Research Project Supervision

1. Lizeth Castillo Reyes, LU BUDM, Center for Resiliency, 2025
2. Joe Borden, DOE UIFL, SETXFCD Regional Flood Sensor Network, 2025
3. Slater Macon, SETXFCD Regional Flood Sensor Network, 2024
4. Kolby Woods, SETXFCD Regional Flood Sensor Network, 2024
5. Dylan Roberts, SETXFCD Regional Flood Sensor Network, 2023
6. Issac Sleeman, SETXFCD Regional Flood Sensor Network, 2023

7. Dustin Barnes, SETXFCD Regional Flood Sensor Network, 2023
8. Damidrick Fearce, SETXFCD Regional Flood Sensor Network, 2023
9. Landen Barrow, SETXFCD Flood Sensor Maintenance and Thresholds, 2022
10. Mason Wyche, SETXFCD Flood sensor deployment, surveying and GIS mapping, 2022
11. Austin Harvard, Strength and Microstructure of ultra-high-performance fiber reinforced concrete in microgravity. Part of the Student Spaceflight Experiments Program (SSEP). Specimens sent to the International Space Station.
12. Lucas Mason, Strength and Microstructure of ultra-high-performance fiber reinforced concrete in microgravity. Part of the Student Spaceflight Experiments Program (SSEP). Specimens sent to the International Space Station.
13. Cade Flebbe, Effects of structured water on concrete compression strength
14. Hayden Rice, Fracture and fatigue toughness of treated recycled aggregate concrete, 2017
15. Kyle Edwards, Durable magnetic cements for vehicle wireless charging applications, OUR Research Fellowship, 2016
16. Michael Bourne, "A low-cost next generation pavement damage detection technique", Lamar University OUR Research Fellowship, 2014
17. Nicholas Carillo, Billy Wilson, Murphy Mason, "Fracture resistance and size effect of high-performance pervious concretes", Undergraduate Research, 2014

Dissertation/Thesis Committee Member

1. Nara Almeida, D.E. Dissertation: "Increasing the resistance of pervious concrete to magnesium chloride attacks through carbonation", 2020
2. Darshil Patel, M.S. Thesis: "Investigation on intercalation behavior of b-c-n compound for multivalent-ions", 2017
3. Md Hazzaz Mahmud, M.S. Thesis: "Efficient Wireless Power Charging of Electric Vehicle by modifying the magnetic characteristics of the medium", 2016
4. Jeremy John Adams, M.S. Thesis: "Vapor pressure prediction in reflow for stacked-chip packages by convection-diffusion model", 2015
5. Md Aviquzzaman, M.S. Thesis: "Analysis of plug-in hybrid electric vehicles' utility factors using GPS-based longitudinal travel data", 2014
6. Md Hafizur Rahman, M.S. Thesis: "Probability analysis of vessel collisions and groundings in southeast Texas waterways", 2014
7. Ozgur Taner, M.S. Thesis: "Analytical and Numerical Analysis of 2D electromigration driven vacancy transport equation", 2014

Awarded Research Grants

Total Funding as PI/CoPI: $7,201,397

1. Lamar University Beneficial Use of Dredge Material Advancement Coalition (BUDMAC), (2025-2026), $300,000, **PI**

2. Southeast Texas Flood Coordination Study--Regional Flood Sensor System, (2025-2027), Texas General Land Office Coastal Management Program Cycle 30 (NOAA Funded), $547,457, **PI**
3. Southeast Texas Urban IFL: Equitable solutions for communities caught between floods and air pollution, DE-SC0023216, (2022-2027), Department of Energy $5,000,000, **CoPI**
4. Southeast Texas Regional Flood Sensor Network, (2024), Lamar University Center for Resiliency, $100,000, **PI**
5. Southeast Texas Regional Flood Sensor Network, (2023), Lamar University Center for Resiliency, $100,000, **PI**
6. Biological and Physiochemical Treatment of Produced Water, Center for Midstream Management and Science (2020-2021), $23,000, **CoPI**
7. DoD DURIP W911NF-19-1-0185: Dynamic Test System with Direct Impact and Split Hopkinson Pressure Bar Modules for Advance Material Characterization, (2019-2020), Department of Defense DURIP, $141,000, **CoPI**
8. NSF MRI 1726022: Acquisition of a Nanoindenter for Advanced Materials Research and Education at Lamar University, National Science Foundation, (2017-2018), $395,805, **CoPI**
9. Development of a thin and durable wireless charging pad encasement for battery electric vehicles, Lamar University, (2017). $8,000, **PI**
10. Engineering a thin high-performance fiber reinforced magnetic cement composite shell to encase roadway wireless charging pads, Lamar University Research Enhancement Grant. (2017-2018), $15,000, **PI**
11. Remote pavement distress surveying with a drone and multi-spectral cameras, Center for Innovation, Commercialization, and Entrepreneurship, (2018-2019), $1,500, **PI**
12. NSF RET 1608886: RET SITE: Incorporating Engineering Design and Manufacturing into High School Curriculum, National Science Foundation, (2016-2021). $545,380. **CoPI**
13. Enhancing Freshman Civil Engineering Student Engagement with Project Based and Peer Assisted Learning: ENGR 1101-Project Based Introduction to Engineering, Lamar University Presidential Faculty Fellowship, (2015-2016). $14,255, **PI**
14. Development of an enhanced nano-reinforcement cocktail to improve the performance of recycled concrete aggregate, Lamar University Research Enhancement Grant, (2015-2016). $5,000, **PI**
15. Detection of chemical attack in self-sensing concrete, Lamar University Research Enhancement Grant, (2014-2015). $5,000, **PI**

Attended Professional Conference and Events

- AASHTO Maintenance Conference, July 2025, Minneapolis, MN
- American Society of Civil Engineers Department Heads Meeting and Education Summit, June 2025, Cleveland OH
- Department of Energy Urban Integrated Field Laboratory Annual Meeting, Washington, D.C., September 2023
- Texas Floodplain Management Association Annual Conference, Houston, TX March 2023
- Texas Grant Land Office Coastal Management Program Workshop, March 2023
- Transportation Research Board Conference, Washington, D.C., January 2021 (Virtual)

- American Society of Engineering Education, Montreal, Canada June 2020 (Virtual)
- Transportation Research Board Conference, Washington, D.C., January 2020
- Transportation Research Board Conference, Washington, D.C., January 2019
- Transportation Research Board Conference, Washington, D.C., January 2018
- Texas Society of Professional Engineers-Sabine, 2017
- Transportation Research Board Conference, Washington, D.C., January 2017
- American Society of Engineering Education, New Orleans, June 2016
- Transportation Research Board Conference, Washington, D.C., January 2016
- Texas Society of Professional Engineers-Sabine, 2016
- Faculty Entrepreneurial Bootcamp, Lamar University, 2016
- American Society and Civil Engineers T&DI, Miami, FL., June 2015
- Transportation Research Board Conference, Washington, D.C., January 2015
- Texas Society of Professional Engineers-Sabine, 2015
- Concrete Canoe Competition, Tyler, TX, April 2014
- Southeast Texas Entrepreneur Conference-Speaker: Jack Gill, April 2014
- Texas Society of Professional Engineers-Sabine, 2014
- Texas Department of Transportation IC Workshop, Houston, TX, February 2014
- Transportation Research Board Conference, Washington, D.C., January 2014
- Steel Bridge Competition, Arlington, TX, December 2013
- Texas Society of Professional Engineers-Sabine, 2013
- Texas Department of Transportation RFP Workshop, Austin, TX, July 2013
- Portland Cement Association Professor's Workshop, Skokie, Illinois, July 2013
- Transportation Research Board Conference, Washington, D.C., January 2013
- International Conference of Concrete Pavements, Quebec City, Quebec, June 2012
- Transportation Research Board Conference, Washington, D.C., January 2012
- EUPave Advanced Concrete Pavement Workshop, Carmona, Spain, October 2010