



NICHOLAS A. BRAKE

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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

- 2012 – Current, Assistant Professor, Lamar University, Beaumont, Texas
- 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
<ul style="list-style-type: none"> ● CVEN 1101 Introduction to Civil Engineering*, ** ● CVEN 2301 Statics** ● CVEN 3200 Engineering Material Systems** ● CVEN 3340 Structural Analysis** ● CVEN 4110 Professional Seminar** ● CVEN 4380 Reinforced Concrete Design I ● ENGR 4301-11: Undergraduate Research 	<ul style="list-style-type: none"> ● ENGR 5388 Advanced Pavement Analysis and Design* ● CVEN 5300 Advanced Structural Analysis** ● ENGR 5301 Structural Dynamics* ● ENGR 5301 Structural Mechanics*

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

**Courses taught in the last two years

Independent Study Courses

- ENGR 4301-11: Undergraduate Research
- ENGR 5301-11 Pavement Data Processing
- ENGR 5301-13 Concrete Characterization I
- ENGR 5301-NBR Pavement Performance Modeling

Awards

- 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

<p>FRESHMAN: CVEN 1101 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 ($p < 0.1$).</p>	<table border="0"> <tr> <td style="text-align: center;">Design</td> <td style="text-align: center;">Build</td> <td style="text-align: center;">Test</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	Design	Build	Test			
Design	Build	Test					
							
<p>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 ($p < 0.005$).</p>	<table border="0"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>						
							
<p>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 ($p < 0.005$).</p> <p>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 ($p < 0.005$).</p>	<table border="0"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>						
							
<p>EXTRA-CURRICULAR ACTIVITIES: ASCE Concrete Canoe and Steel Bridge Team Technical Adviser. I serve as the technical adviser to the ASCE student chapter. Students apply their engineering knowledge to solve problems with realistic constraints through project-based learning and design-build-test activities.</p>	<table border="0"> <tr> <td></td> <td></td> </tr> </table>						
							
<p>K-12 EDUCATOR OUTREACH: As part of a National Science Foundation Project, we are training high school educators to integrate engineering design and manufacturing into the high-school curriculum. We visited manufacturing plants, conducted research, and developed teaching workshops.</p>	<table border="0"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>						
							
<p>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.</p>	<table border="0"> <tr> <td></td> <td></td> <td></td> </tr> </table>						
							

Teaching Evaluations

Student Comments

I have compiled a small sample size of student comments from course evaluations over the last five years. These comments are shown below. The students affirm that my teaching methods are very effective and they appreciate my individual efforts, and the efforts of the department, college, and university. For a complete list of all student comments, please refer to my course evaluation reports that are appended to the end of Volume II-A.

- “Enthusiastic. Uses objects as examples (foam beam)”
- “Phenomenal teacher”
- “Overall, Dr. Brake is a very good professor. He sincerely seems to care whether or not the students understand the material. Regardless of the grade I receive in this course, I learned a great deal from it.”
- “He is a great teacher, and knows his stuff. He also knows how to incorporate jokes into the lectures to make them pretty fun.”
- “He definitely knows his stuff. He uses the powerpoints as an outline and is then able to talk off the top of his head and passionately deliver the material. He also is able to tell when the material gets boring and slips subtle jokes to liven the morale up a bit.”
- “Great teacher, one of the best at helping students learn and understanding the material. Best teacher I've had so far at Lamar.”
- “Did an excellent job at connecting the concepts to real situations.”
- “Always prepared for class, gives a comprehensive lecture, and always prepared to help students learn the material. The assignments are challenging but manageable”.
- “The BEST professor I have had at Lamar University. GREAT TEACHER!!!!”
- “Delivers course material clearly and always open to answer questions or discuss issues that present themselves.”
- “Great Examples, Very Smart, Knows the subject very well and displays it for the student to learn.”
- “Explains the concepts very clearly. Really helped the students understand each topic thoroughly.”
- “Knows material extremely well, enthusiastic, very helpful, willing to help each student succeed, always available.”
- “He is a very friendly teacher and that is why students can always ask him questions about their confusions. He is interested to listen to students carefully. Moreover, he elaborately explains the subject matter which is really helpful to create a strong fundamental basis of the course. He is smart enough to grab the attention of the whole class throughout the class time.”
- “Dr. Brake always makes sure to explain every chapter thoroughly, while allowing us to ask any questions that arise during the lesson. Very understanding and considerate.”
- “Very prepared for lecture and able to deliver the material in the most stimulating way possible.”
- “Relates well with students. Knows and is very familiar with all material and can go into depth.”
- “Awesome professor would take any classes he teaches because I'm guaranteed to learn something and he will make it interesting.”

Course Evaluations

Since joining Lamar, I have received superb reviews and continue to record some of the highest evaluations in the department, college, university, and division. In this section, I have provided a summary of the courses taught each year, number of students in each course, and the average score on Item 10: Overall, the instructor is a good teacher. The item is scored on a likert scale from 1 to 5 with a score of 1 representing a response of “strongly disagree” and a score of 5 representing a response of “strongly agree”.

Semester	Dept	Num	Sec	Course	Type	Total	Resp.	Credit Hours	SCH	Rating
Fall 2012	CVEN	3340	2	Structural Analysis	LEC	12	11	3	36	4.9
Fall 2012	CVEN	2301	12	Statics	LEC	32	25	3	96	4.5
Spring 2013	CVEN	3200	1	Eng. Mat Sys	LEC	15	15	2	30	4.9
Spring 2013	CVEN	3200	11	Eng. Mat Sys	LAB	6	15		0	5.0
Spring 2013	CVEN	2301	2	Statics	LEC	28	26	3	84	4.8
Summer 2013	CVEN	2301	10	Statics	LEC	16	15	3	48	4.9
Summer 2013	CVEN	5388	10	Adv. Pavement Analysis and Design	LEC	7	7	3	21	4.7
2012-2013 Summary						116	114		315	4.8
Fall 2013	CVEN	2301	12	Statics	LEC	43	38	3	129	4.7
Fall 2013	CVEN	3340	2	Structural Analysis	LEC	19	6	3	57	4.5
Fall 2013	CVEN	5300	12	Adv. Structural Analysis	LEC	6	5	3	18	4.8
Spring 2014	CVEN	3200	1	Eng. Mat Sys	LEC	16	8	2	32	4.9
Spring 2014	CVEN	3200	11	Eng. Mat Sys	LAB	16	7		0	4.6
Spring 2014	CVEN	2301	2	Statics	LEC	28	26	3	84	4.8
Spring 2014	ENGR	5301	NB	Structural Mechanics	LEC	11	11	3	33	5.0
Summer 2014	CVEN	2301	10	Statics	LEC	30	27	3	90	4.2
Summer 2014	ENGR	5301	14	Structural Dynamics	LEC	7	7	3	21	4.7
2013-2014 Summary						176	135		464	4.6
Fall 2014	CVEN	2301	12	Statics	LEC	64	56	3	192	4.2
Fall 2014	CVEN	3340	2	Structural Analysis	LEC	22	17	3	66	4.8
Fall 2014	CVEN	5300	12	Adv. Structural Analysis	LEC	30	26	3	90	4.2
Spring 2015	CVEN	3200	1	Eng. Mat Sys	LEC	23	15	2	46	4.9

Spring 2015	CVEN	3200	11	Eng. Mat Sys	LAB	23	9		0	4.9
Spring 2015	CVEN	2301	2	Statics	LEC	51	44	3	153	4.2
Summer 2015	CVEN	2301	10	Statics	LEC	44	39	3	132	4.4
Summer 2015	ENGR	5301	14	Structural Mechanics	LEC	13	13	3	39	4.5
2014-2015 Summary						270	219		718	4.4
Fall 2015	CVEN	3340	2	Structural Analysis	LEC	31	24	3	93	4.4
Fall 2015	CVEN	4110	11	Seminar	PRA	17	11	1	17	4.6
Fall 2015	CVEN	4380	2	Reinforced Concrete Design	LEC	15	13	3	45	4.6
Fall 2015	ENGR	4101	11	Intro to Civil Eng	LEC	18	16	1	18	4.2
Fall 2015	CVEN	5300	12	Adv. Structural Analysis	LEC	9	9	3	27	4.4
Fall 2015	CVEN	5398	2	Reinforced Concrete Design	LEC	7	7	3	21	4.1
Spring 2016	CVEN	3200	10	Eng. Mat Sys (Co taught with Su)	LEC	20	16	2	40	4.3
Spring 2016	CVEN	3200	11	Eng. Mat Sys (Co taught with Su)	LAB	20	16		0	4.3
Spring 2016	CVEN	2301	1	Statics	LEC	51	40	3	153	4.5
Spring 2016	CVEN	2301	2	Statics	LEC	51	41	3	153	4.3
Summer 2016	CVEN	2301	10	Statics	LEC	36	33	3	108	4.2
2015-2016 Summary						275	226		675	4.4
Fall 2016	CVEN	1101	11	Intro to Civil Eng	LEC	13	6	1	13	4.4
Fall 2016	CVEN	3340	2	Structural Analysis	LEC	18	13	3	54	4.8
Fall 2016	CVEN	4110	11	Seminar	PRA	20	12	1	20	4.9
Spring 2017	CVEN	3200	10	Eng. Mat Sys	LEC	14	11	2	28	4.6
Spring 2017	CVEN	3200	12	Eng. Mat Sys	LAB	14	10		0	4.8
2016-2017 Summary						79	52		115	4.7

Teaching Evaluation: Comparison between Department, College, and University averages

Academic Level	Course	Name	No. of Responses	Instructor is a good teacher	Instructor stimulated interest	Learned a lot overall	Help achieve learning	Instructor available
Freshman	CVEN 1101	Introduction to Civil Engineering	25	4.4	4.2	4.0	4.0	4.3
Sophomore	CVEN 2301	Statics	413	4.5	4.1	4.3	4.3	4.3
Junior	CVEN 3200	Engineering Material Systems	77	4.8	4.7	4.8	4.8	4.8
Junior	CVEN 3340	Structural Analysis	69	4.6	4.5	4.5	4.5	4.5
Senior	CVEN 4110	Professional Seminar	39	4.6	4.6	4.5	4.6	4.7
Senior	CVEN 4380	Reinforced Concrete Design	13	4.6	4.2	4.4	4.4	4.4
Graduate	CVEN 5300	Adv. Structural Analysis	60	4.4	4.1	4.3	4.2	4.2
Graduate	ENGR 5301	Structural Mechanics	29	4.8	4.5	4.6	4.7	4.8
Graduate	ENGR 5301	Structural Dynamics	7	4.7	4.9	4.7	4.7	4.9
Graduate	CVEN 5388	Adv. Pavement Analysis and Design	7	4.7	4.3	4.0	4.1	4.7
Brake Average			739	4.6	4.3	4.4	4.4	4.4
Brake Average - Department Average			-	+0.4	+0.2	+0.2	+0.2	+0.1
Brake Average - College Average			-	+0.3	+0.2	+0.2	+0.2	+0.1
Brake Average - University Average			-	+0.3	+0.2	+0.2	+0.2	+0.1

Not reporting data from courses that were co-taught with other instructors.

Data from the lab sections of CVEN 3340 and CVEN 4380 were not reported because the courses do not actually include laboratory meetings or activities.

Before 2016, CVEN 5300 was a merged class with the junior undergraduate course CVEN 3340. This model was not successful and changed in 2016. The courses are now separated and both are flourishing.

Word Cloud: Student Comments

accurate added allowed **always** analysis answer apply ask assignments attention available awesome axis basics **beam** begin **best** board boring calculation cared centered change **chapter** civilization **class** classwork clear college communicative **competent** completely concentrated concepts **covered** credit delivery delivered demonstration department designed diagram difficult **easy** effective engaging engineering enjoyable enthusiastic **exam** excellent **expectations** explaining **fantastic** fast feel few finished follow force forward freshman friendly funny future grade grave **great** groups hand happy hardest helpful highly **material** matter mentoring method mind moment **not** **knowledge** laboratory lamar later learning leave lecture left level life linear listen little load long love manner **material** matter mentoring method mind moment **not** **knowledge** laboratory lamar later learning leave lecture left level life linear listen little load long love powerpoint prepared presentation **problematic** **professor** project question **student** teaching telling tendency textbook thanks think thorough **time** too too_fast topical understanding unhappy using very_clear very_fast-paced very_helpful very_knowledgeable video wanted weakness **well_done** willingness wish wood worker works worthwhile write young

SERVICE

Professional Service

National Committee Memberships or Associations

- Member and Secretary, Transportation Research Board AFN20: Properties of Concrete, 2013-current
- 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)

Journal/Conference Paper Referee

- Reviewer: Engineering Fracture Mechanics, 6 Reviews
- Reviewer: Construction and Building Materials, 1 Review
- Reviewer: Advances in Structural Engineering, 1 Review
- Reviewer: American Society of Engineering Education, 3 Reviews
- Reviewer: Transportation Research Record: AFN20: Properties of Concrete, 9 Reviews
- Reviewer: International Journal of Pavement Engineering, 3 Reviews
- Reviewer: ASCE Journal of Civil Engineering Materials, 4 Reviews
- Reviewer: Transportation Research Record: AFD50: Design and Rehabilitation of Concrete Pavements, 9 Reviews
- Reviewer: Road Materials and Pavement Design, 1 Review
- Reviewer: Transportation Research Record: AFN10: Basic Research and Emerging Technologies Related to Concrete, 3 Reviews

No. of Reviews: 40

Service as a Commentator, Panelist, Discussant at Professional Meetings

- 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

- Quality Enhancement Program (QEP) College of Engineering Representative, 2017
 - QEP Marketing Committee, 2017
 - QEP Literature Review Committee, 2017
- Faculty Senate Member, 2016-Present
 - Chair, Faculty Senate Development Leave Committee, 2017
 - Faculty Senate Development Leave Committee Member, 2016-Present
 - Faculty Senate Executive Committee Member, 2017-Present
- 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

- Chair, CEE Undergraduate Curriculum Committee, 2017
- High School Open House Host and Presenter, 2012-2016
- CEE Department Chair Search Committee Member, 2016
- Chair, CEE Visiting Professor Structural Engineering search committee, 2015
- Technical Faculty Adviser and Chaperone, Steel Bridge Team and Concrete Canoe Team; travelled with team to Corpus Christi, Tyler, Arlington, and Austin, TX.

College of Engineering

- Lamar University SMART Math Camp Presenter: Civil and Environmental Engineering Dept., 2017
- Lamar University LITE SENIOR Instructor and Presenter, 2017
- STEM Educator Outreach: Presenter: “Building Student Confidence and Motivation with Hands-On Engineering Design Projects”, 2017
- Guest Lecturer, CMGT 2420: Introduction to Civil Engineering and the benefits of going to graduate school, 2017
- Guest Lecturer, INEN 1101: Introduction to Engineering, 2014-2016
- C.O.E. Dean search committee member, 2014 & 2015
- Research and Teaching Laboratory Safety Committee, 2015
- BSIT Transfer and Retention Committee, 2016
- K-12 Outreach: Introduction of Girls to Engineering Lab and Research Presentation, 2015
- K-12 Outreach: LITE Engineering Summer Camp: “Introduction to civil engineering and hands-on exercises”, 2014-2016
- STEM Educator Outreach: Presenter: “Effective Engineering Teaching: From Theoretical to Real-World Applications”, 2014

- Faculty Adviser, Engineers Without Borders, 2013-2015
- Graduation Commencement Marshal, 2013, 2016
Lamar State College, Port Arthur, 2014-2015
- K-12 Outreach: “Introduction to civil engineering and hands-on exercises”, 2014-2015

RESEARCH

Refereed Journal Publications

1. 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., In Press*.
2. **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
3. **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
4. 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*
5. 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
6. **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
7. **Brake, Nicholas, A.**, Allahdadi, Hamid., Adam, Fatih., (2016). Flexural strength and fracture size effects of pervious concrete. *Construction and Building Materials*, 113, 536-543.
8. Thang, Vul, Marshall, P., **Brake, Nicholas A.** (2016). Studded Bond Enhancement for SCS sandwich shells, *Ocean Engineering*, 32-41, 124.
9. Sudani, Ghassan A., **Brake, Nicholas. A.**, Jao, Mien. (2015). Stability of Footings Adjacent to Pile-Walls, *ASCE International Journal of Geomechanics*, 15(6).
10. **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.
11. **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. 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.
2. Edwards, Kyle A. T., **Brake, Nicholas A.**, (2018). Increasing Concrete Magnetic Permeability with the Addition of Soft Iron and Stainless Steel Fiber Inclusions. In *ASCE Transportation and Development Institute*, Pittsburgh, PA, July 15-18
3. **Brake, Nicholas A.**, Oruji, S., Haselbach, L. (2018). Increasing compressive strength of recycled aggregate concrete using high fineness bottom ash blended cement. In *ASCE Transportation and Development Institute*, Pittsburgh, PA, July 15-18
4. Soheil Oruji, **Nicholas A. Brake**, Ramesh K. Guduru, Clayton Jeffryes, Likhith Nalluri, Shishir Kumar, Adarsh Bafana, Hayden Rice (2017). Dispersed ultra-fine bottom ash blended mortar. In *Proceedings of the Transportation Research Board*.
5. 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>
6. **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.
7. **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.
8. **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.
9. **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.
10. **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.
11. 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.
12. **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*.
13. **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*.
14. **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.

15. **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.
16. 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.
17. 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.

Manuscripts Under Review

1. T. Thuy Minh Nguyen, Saeed Rabbanifar, Qin Qian, **Nicholas A. Brake**, Kyle Kibodeaux, Harold E. Crochet, Soheil Oruji, Remington Whitt, Joshua Farrow, Brandon Blaire, Paul Bernazzani, Mien Jao (2017). Stabilization of Dredged Material Using Bio-Enzyme Products, *ASTM Geotechnical Testing Journal*, Under Review

Manuscripts Under Preparation

1. Oruji, Soheil, **Brake, Nicholas, A.**, Guduru, Ramesh, Rabbanifar, Saeed, Nalluri, Likhith., (2017). Ultra-fine coal bottom ash as a partial cement replacement to mitigate ASR expansion. *ASCE J. Civ. Eng. Mat.*, Under Preparation

Conference Proceeding Presentations

1. **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.
2. **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.
3. **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.
4. **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.
5. **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*.
6. **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*.
7. **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. 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
2. Weam Elmahmoud, M.S. Thesis: “Experimental analysis of fine impregnated electrically conductive powders in Portland cement”. December 2016
3. Fatih Adam, D.E. Dissertation: “Structural Analysis of a rigid pavement overlaying a sub-surface void”, December 2015
4. Samson Negeri, M.S. Thesis: “The effects of heavy multiple axle trucks on rigid pavement distress in various climatic regions”, May 2014
5. Vul Thang, M.S. Thesis: “Studded bond enhancement for SCS sandwich shells”, August 2014
6. Ali Banaa, M.S. Thesis: “Early age damage quantification of actively restrained concrete using inverse analysis”, December 2014
7. Sina Nejad, D.E. Dissertation: “Protection of petrochemical facilities from accidental and manmade threats”, December 2014
8. Ghassan Sudani, D.E. Dissertation: “Stability of shallow foundations adjacent to spaced piles-row”, 2013

Undergraduate Research Project Supervision

1. Hayden Rice, Fracture and fatigue toughness of treated recycled aggregate concrete, 2017
2. Kyle Edwards, Durable magnetic cements for vehicle wireless charging applications, OUR Research Fellowship, 2016
3. Michael Bourne, “A low-cost next generation pavement damage detection technique”, Lamar University OUR Research Fellowship, 2014
4. Nicholas Carillo, Billy Wilson, Murphy Mason, “Fracture resistance and size effect of high performance pervious concretes”, Undergraduate Research, 2014

Dissertation/Thesis Committee Member

1. Darshil Patel, M.S. Thesis: “Investigation on intercalation behavior of b-c-n compound for multivalent-ions”, 2017
2. Md Hazzaz Mahmud, M.S. Thesis: “Efficient Wireless Power Charging of Electric Vehicle by modifying the magnetic characteristics of the medium”, 2016
3. Jeremy John Adams, M.S. Thesis: “Vapor pressure prediction in reflow for stacked-chip packages by convection-diffusion model”, 2015

4. Md Aviquzzaman, M.S. Thesis: “Analysis of plug-in hybrid electric vehicles’ utility factors using gps-based longitudinal travel data”, 2014
5. Md Hafizur Rahman, M.S. Thesis: “Probability analysis of vessel collisions and groundings in southeast Texas waterways”, 2014
6. Ozgur Taner, M.S. Thesis: “Analytical and Numerical Analysis of 2D electromigration driven vacancy transport equation”, 2014

Awarded Research Grants

1. National Science Foundation, “MRI: Acquisition of a Nanoindenter for Advanced Materials Research and Education at Lamar University”, (2017-2018), \$395,805, **Senior Personnel**
2. Summer Research Faculty Fellowship, “Development of a thin and durable wireless charging pad encasement for battery electric vehicles” (2017). \$8,000, Lamar University, **PI**
3. Research Enhancement Grant, “Engineering a thin high-performance fiber reinforced magnetic cement composite shell to encase roadway wireless charging pads” (2017-2018). \$15,000, Lamar University Research Enhancement Grant, **PI**
4. Center for Innovation, Commercialization, and Entrepreneurship Summer Project, “Remote pavement distress surveying with a drone and multi-spectral cameras, \$1,500, Lamar University, **PI**
5. “The Interdisciplinary Freshman Experience at Lamar University” (2016-2019). \$120,000, Lamar University, **Senior Personnel**
6. “RET SITE: Incorporating Engineering Design and Manufacturing into High School Curriculum”, (2016-2019). \$545,380. National Science Foundation, **Senior Personnel**
7. “Enhancing Freshman Civil Engineering Student Engagement with Project Based and Peer Assisted Learning: ENGR 1101-Project Based Introduction to Engineering” (2015-2016). \$14,255, Lamar University Presidential Faculty Fellowship, **PI**
8. “Development of an enhanced nano-reinforcement cocktail to improve the performance of recycled concrete aggregate” (2015-2016). \$5,000, Lamar University Research Enhancement Grant, **PI**
9. Detection of chemical attack in self-sensing concrete”, (2014-2015). \$5,000, Lamar University Research Enhancement Grant, **PI**
10. “The development of a cost-effective conductive concrete for highway infrastructure applications”, (2015-2016). \$1,500, Office of Undergraduate Research Lamar University, **Undergraduate Mentor**
11. Internal: Office of Undergraduate Research OUR Award: “A low cost next-generation pavement damage detection technique” (2014-2015). \$1,500, Office of Undergraduate Research Lamar University, **Undergraduate Mentor**

Pending Research Proposals

1. “Enhanced Agricultural Land Use Through Improved Management and Construction of Dredge Material Placement Area (DMPA’s)”, United States Department of Agriculture-NLCA, \$148,883, **Co-PI**

Attended Professional Conference and Events

- 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