

Blake Everett Johnson

Teaching Assistant Professor, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign

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Degrees

- PhD Theoretical and Applied Mechanics, UIUC, 2012
- MS Theoretical and Applied Mechanics, UIUC, 2007
- BS Engineering Mechanics, UIUC, 2005 Secondary Field: Wave Mechanics

Academic Positions at U of I and elsewhere

- Teaching Assistant Professor, Mechanical Science and Engineering, UIUC, 2019–2022
- Lecturer, Mechanical Science and Engineering, UIUC, 2015–2019
- Visiting Lecturer, Mechanical Science and Engineering, UIUC, 2014–2015
- Postdoctoral research associate, Aerospace Engineering, Iowa State University, 2012–2013

Professional Registrations

- Member, American Society for Engineering Education

Honors, Recognition, and Outstanding Achievements for Teaching

Award Name	Date Awarded
Engineering Council Outstanding Adviser Award	2021, 2022
Incomplete List of Teachers Ranked as Excellent	2017, 2008, 2007, 2006
James O. Smith Memorial Award for Teaching Excellence	2007

Other Instructional Activities

- Multi-Disciplinary Service Learning SIIP Team Member, 2021–present
- Writing Across Engineering SIIP Team Member, 2020–2022
- Engineers SPEAK SIIP Team member, 2017–present
- iELITE SIIP Team member, 2016–present
- MechSE iDesign SIIP Team member, 2015–present
- TAM 2XX SIIP Team member, 2014–2018

Academic advising

- Jeremy Witten, TAM 297 Independent Study, Spring 2022, conducted interviews with MechSE faculty about their professional development and research interests
- Phillip Murphy, TAM 297 Independent Study, Fall 2021, conducted interviews with MechSE faculty about their professional development and research interests
- Yeshi Cai, TAM 297 Independent Study, Spring 2021, conducted interviews with MechSE faculty about their professional development and research interests

Student organizations

- Illini Hyperloop RSO, 2015–2020

Design teams

- Illini Hyperloop SpaceX Pod Competition, 2017–2019
- ME 470, Design of an Adjustable Z-Type Anti-Roll Bar for the Linkoping University FSAE Team, Fall 2020
- ME 470, An air duct mode control for HVAC systems, Fall 2021
- ME 470, Development of New Flow Visualization Devices in a Fluid Mechanics Laboratory, Spring 2022
- ME 470, Development of an Inquiry-Based Laboratory Experience in Heat Transfer, Spring 2022

Articles In Journals

- King, W.P., Amos, J., Azer, M., Baker, D., Bashir, R., Best, C., Johnson, B.E., ... & Wooldridge, A. R. (2020). Emergency ventilator for COVID-19. *PloS one*, 15(12), e0244963.
- Johnson, B.E., Tian, W., Zhang, K. & Hu, H. An Experimental Study of Density Ratio Effects on the Film Cooling Injection from Discrete Holes by Using PIV and PSP Techniques. *International Journal of Heat and Mass Transfer*, **76**: 337-349, 2014. [DOI: 10.1016/j.ijheatmasstransfer.2014.04.028](https://doi.org/10.1016/j.ijheatmasstransfer.2014.04.028).
- Johnson, B.E., Elliott, G.S. & Christensen, K.T. Structural Characteristics of a Heated Jet in Cross-Flow Emanating from a Raised, Circular Stack. *Experiments in Fluids* (2013) **54**: 1543. <https://doi.org/10.1007/s00348-013-1543-1>
- Johnson, B.E. & Christensen, K.T. [Turbulent Flow Over Low-Order Models of Highly-Irregular Surface Roughness](#). *ALAA Journal* (2009) **47** (5): 1288–1299.

Articles In Conference Proceedings

- Chen, Y.W., Johnson, B.E., Johnson, B.K., Pool, M. & Shehab, S. "Engagement in Practice: Toward Building University of Illinois at Urbana-Champaign's Multi-Disciplinary Service -Learning Ecosystem." ASEE 2022 Annual Conference. Minneapolis, MN. June 28, 2022.
- Choi, H.H., Havan, S., Hathaway, C., Johnson, B.E., Beckman, M.A., Chen, Y.W. & Anderson, L. "Inform Track: Integrated Teaching and Leadership Development Program for Graduate Teaching Assistants." 2021 ASEE Virtual Annual Conference Content Access. 2021.
- Johnson, B.E., Hathaway-Goldstein, M.G. & Bradley, J.A. "Work-in-progress: Identifying Effective Student Leaders to Improve Capstone Design Team Assignments." 127th ASEE Annual Conference & Exposition. Online. June 23, 2020.
- Mohan, A.K., Dey, P., Silva, M.F. & Johnson, B.E.. "Introducing junto: a Web Tool to Build Project Teams based on a Bidding Strategy." 127th ASEE Annual Conference & Exposition. Online. June 23, 2020
- Chen, Y.W., Choi, H.H., Johnson, B.E., Beckman, M. & Anderson, L. Integrated Engineering Leadership Initiative for Teaching Excellence (iELITE) Year Two: Assessment of Intermediate-Term Outcome for Graduate Teaching Assistant Training. 126th ASEE Annual Conference & Exposition. Tampa, FL. June 18, 2019.
- Jassim, E.W. & Johnson, B.E. An Integrated Four-year Hands-on Design Curriculum: A Case Study. 126th ASEE Annual Conference & Exposition. Tampa, FL. June 18, 2019. **This paper was nominated by the ASEE Mechanical Engineering Division as the best paper of the 2019 conference*

- Lee, G.S., Kim, K., Johnson, B.E., Elliott, G.S. & Dutton, J.C., "A Compressible Mixing Layer Facility for CFD Validation Measurements," presented at the 32nd AIAA Aerodynamic Measurement Technology and Ground Testing Conference, AIAA Paper No. 2016-3982, June 2016.
- Kim, K., Lee, G.S., Johnson, B.E., Elliott, G.S. & Dutton, J.C., "Stereoscopic PIV Measurements of a Turbulent Compressible Mixing Layer for CFD Validation," presented at the 47th AIAA Fluid Dynamics Conference, AIAA Paper 2017-4129, June 2017.
- Choi, H.H., Chen, Y.W., Beckman, A.M., Anderson, L., Johnson, B.E., Goodman, M., Migotsky, C. & Johnson-Glauch, N. Integrative Engineering Leadership Initiative for Teaching Excellence (iELITE). 125th [ASEE Annual Conference & Exposition. Salt Lake City, Utah.](#) June 23, 2018. <https://peer.asee.org/30696>
- Johnson, B.E. & Morphew, J.W. An Analysis of Recipe-Based Instruction in an Introductory Fluid Mechanics Laboratory. 123rd ASEE Annual Conference & Exposition. New Orleans, LA. June 26, 2016. DOI: 10.18260/p.26564
- Johnson, B.E. & Hu, H., Measurement Uncertainties Analysis in the Determination of Adiabatic Film Cooling Effectiveness by Using Pressure Sensitive Paint (PSP) Technique, FEDSM2014-21230, 4th Joint US-European ASME Fluids Engineering Summer Meeting, Chicago, IL, August 3–7, 2014.
- Zhou, W.W., Johnson, B.E. & Hu, H., An Experimental Study of Momentum-Preserving Shaped Holes for Film Cooling Using PSP and PIV, AIAA-2014-0280, 2014 AIAA Science and Technology Forum and Exposition (SciTech2014), National Harbor, Maryland, 13 - 17 January, 2014.
- Zhang, K., Johnson, B.E., Rothmayer, A.P. & Hu, H., An Experimental Investigation on Wind-Driven Rivulet/Film Flows over a NACA0012 Airfoil by Using Digital Image Projection Technique, AIAA-2014-0741, 2014 AIAA Science and Technology Forum and Exposition (SciTech2014), National Harbor, Maryland, 13 - 17 January, 2014.
- Johnson, B.E., Zhang, K., Wei, T. & Hu, H., An Experimental Study on Film Cooling Effectiveness by Using PIV and PSP Techniques, AIAA-2013-0603; 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Grapevine, Texas, USA, 07 - 10 January 2013.
- Zhou, W.W., Johnson, B.E. & Hu, H., An Experimental Study of Compressibility Effects on the Film Cooling Effectiveness Using PSP and PIV Techniques, AIAA-2015-0352, 2015 AIAA Science and Technology Forum and Exposition (SciTech2015), Kissimmee, Florida, USA, 5-9 January 2015.
- Johnson, B.E., Elliott, G.S. & Christensen, K.T. 2010. An Experimental Study of Heated Circular and Rectangular Jets Emitting into a Crossflow. 16th U.S. National Congress of Theoretical and Applied Mechanics Conference, USNCTAM2010-570.
- Johnson, B.E., Elliott, G.S. & Christensen, K.T. 2010. An Experimental Study of Heated Circular and Rectangular Jets Emitting into a Crossflow. 40th AIAA Fluid Dynamics Conference, AIAA Paper 2010-4846.
- Johnson, B.E., Elliott, G.S. & Christensen, K.T. 2009. An Experimental Study of a Heated Circular Stack Emitting into a Crossflow. 39th AIAA Fluid Dynamics Conference, AIAA Paper 2009-4171.
- Johnson, B.E. & Christensen, K. T.2008. Low-Order Models of Highly-Irregular Surface Roughness. 38th AIAA Fluid Dynamics Conference, AIAA Paper 2008-3961. **This paper was nominated for the best paper award at the conference*

Areas of Research

- Entrepreneurial Mindset Learning
- Service Learning
- Fluid Mechanics
- Professional Identity Development
- Engineering Education

Service to the Department

- Assisted with ABET Outcome evaluations of departmental curricula, 2016, 2017, 2019, 2021
- Undergraduate Programs committee 2021–2022
- Safety committee 2018–2019
- Undergraduate Programs committee 2018–2019

Service to the College

- AE3 Workshop: Maximizing Student Project Teams, Summer 2002
- Workshop facilitator: Incorporating Computing into Engineering Curriculum, Summer 2022
- Entrepreneurial Mindset Fellow, Academy for Excellence in Engineering Education, 2022–present
- ENG/TE Curriculum committee. 2020–2021
- Improving Undergraduate Writing Instruction and Feedback through Professional Development of STEM Graduate-Student Teaching Assistants. SIIP 2020–2021
- iDesign Liason for Aerospace Engineering Adaption SIIP. 2018–2019
- MechSE iDesign SIIP team. 2015–present
- TAM 2XX SIIP team. 2015–2018
- Engineers SPEAK Program. 2018–present
- ENG 598 TL Teaching and Leadership. 2016–present

Service to Campus

- Grainger Library Head search committee, 2021–2022

Other Outside Service

- Development of Service Learning modules for Franklin Middle School, Fall 2020, Spring 2021

Improvement Activities

- Collins Scholar, 2014