John J. Krupczak, Jr.

Department of Engineering, Hope College
Holland, Michigan, 49423 USA
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EDUCATION

Ph.D. Mechanical Engineering	University of Massachusetts, Amherst, MA	1994
M.S. Mechanical Engineering	University of Massachusetts, Amherst, MA	1986
B.A. Physics	Williams College, Williamstown, MA	1980

EMPLOYMENT

Hope College, Holland, Michigan. Engineering Department (ABET Accredited)

Professor of Engineering	2013 - present
Professor of Engineering and Engineering Department Chair	2007 - 2012
Associate Professor of Engineering and Engineering Program Chair	2000 - 2006
Assistant Professor of Engineering	1997 - 2000
Visiting Assistant Professor of Engineering	1994 - 1996

National Science Foundation, Arlington, Virginia — 2013 - 2016
Program Director, Division of Undergraduate Education

Visiting Professor, Meiji Gakuin University, Tokyo, Japan — Fall 2004
Mechanical Engineer, US Dept. of Energy, SSC Laboratory, Dallas, Texas — 1992 - 1994
Technician, Verizon Inc. , Advanced Technology Laboratory, Waltham, MA — 1982 - 1983

OTHER EXPERIENCE

Editorial Review Panel Member and Contributing Author — 2018
30-Second Engineering, The Ivy Press, Quarto Publishing, London (2019)

Subject Matter Expert, McGraw-Hill Higher Education, Inc. — 2016 - 2017
Assessment and Evaluation of Learning Outcomes for Introduction to Engineering

Senior Fellow
Center for the Advancement of Scholarship on Engineering Education (CASEE) — 2008 - 2010
National Academy of Engineering

Intermittent Expert, National Science Foundation, Division of Undergraduate Education — 2019 - 2020

SERVICE IN NATIONAL ORGANIZATIONS

Planning Committee Member, Transforming Undergraduate Engineering Education (TUEE), Phase IV, American Society for Engineering Education, 2016-2017

Invited Panelist, American Society for Engineering Education, Annual Conference, June 2016,
Special Session: Yes, We Can! Assessing the Threatened ABET Outcomes.

Founding Chair, Technological Literacy Division, American Society for Engineering Education (ASEE) 2009 - 2011
(Renamed TELPhE Division - Technological and Engineering Literacy Philosophy of Engineering)

Invited Participant, Workshop on the Philosophy of Engineering and Engineering Education, October 11-12, 2011, Rapid City, South Dakota

Organizing Committee Member, Symposium on Engineering and Liberal Education, Union College, June 3-4, 2011

Invited Panelist, "Engineering and Liberal Education," American Association of Colleges and Universities (AACU) Annual Conference, Washington, DC. January 20-23, 2010

Invited Participant, National Academy of Engineering, Engineering and the Media Working Group, October 9, 2007

Co-organizer (with D. Ollis), The Technological Literacy of Undergraduates: Developing Standard Models, Symposium held at the National Academy of Engineering, Washington D.C., March 26-27, 2007

Chair, Liberal Education Division, American Society for Engineering Education, (ASEE), 2006 - 2007

Co-Organizer (with D. Ollis), The Technological Literacy of Undergraduates: Identifying the Research Issues, Symposium held at the National Academy of Engineering, Washington D.C., April 18-19, 2005

PKAL Writing Team Member, "Engineer of 2020," Engineering Education Summit, National Academy of Engineering, Washington D.C., July 22-23 (2004).

WORKSHOPS ORGANIZED

Workshop: Engineering Reasoning - An Approach to Increasing the Appeal of Introductory Engineering Courses to All Students
Organizers John Krupczak, Katie Polasek, Mani Mina, and Kate Disney
First Year Engineering Education Conference, July 2018

Workshop: Creating Engineering Classes Open to Non-Engineers
Organizers John Krupczak, Katie Polasek, Mani Mina, and Kate Disney
American Society for Engineering Education Annual Conference, June 2018

Workshop: Introducing Engineering to Non-Engineering Students: Timing, Variability, Institutional Commitment, Co-Organizer with Sheila Tobias
American Society for Engineering Education Annual Conference, June 2016

Special session on design metaphors: Rethinking the vocabulary of design education
Organizers Stephen T. Frezza, John Krupczak, and Mani Mina
2015 IEEE Frontiers in Education Conference

Workshop on "Assessment and Measurement of Learning Gains in Technological and Engineering Literacy Courses," Co-Organizer with K. Disney,
July 23-24, 2012, Arlington, VA

"What Were We Thinking? Critically examining our beliefs about the purposes and goals of engineering and engineering education."
Pre-conference Workshop, 2012 Frontiers in Education Conference,
Co-Organizer with R. Korte, and M. Mina,

"A Workshop on Developing Engineering Minors for Non-Engineers,"
Co-Organizer with Mani Mina
American Society for Engineering Education Annual Conference, June 26-29, 2011

"A Workshop on Developing Courses on Engineering for Non-Engineers,"
Co-Organizer with K. Disney,
American Society for Engineering Education Annual Conference, June 14-17, 2009, Austin, TX

GRANTS RECIEVED

National Science Foundation, DUE – 1826512, "Capacity-Building Workshops for Competitive S-STEM Proposals from Two-Year Colleges," Maura Borego, Dave Brown, and J. Krupczak, $437,254.

National Science Foundation, IUSE, DUE – 1650889, "Promoting Introduction to Engineering at Liberal Arts Colleges, Katie Polasek and J. Krupczak, $99,691.

National Science Foundation, IUSE, DUE – 1121464, "Technology Literacy: Assessment and Measurement of Learning Gains," J. Krupczak and Kate Disney, $99,855.

National Science Foundation, CCLI DUE – 0920164, "Expanding Technological Literacy through Engineering Minors," Mani Mina, J. Krupczak, R. Gustafson, and J. Young, $249,999.

National Science Foundation, CCLI DUE – 0736615 "Collaborative Research: EFFECTIVE: Exploring a Framework for Evaluating Courses on Technology In Various Environments," J. Krupczak and T. Simpson, $92,474.

National Science Foundation, CCLI DUE – 0714137, "Technological Literacy of Undergraduates: Developing Standard Models," J. Krupczak and D. Ollis, $49,937.

National Science Foundation, CCLI DUE – 0633277, "Improving Introduction to Engineering by Combining Insights from Non-engineers with Portable Equipment." J. Krupczak and K. Disney, $192,314.

National Science Foundation, CCLI DUE – 0444677, "Technology Literacy Workshop,"
David Ollis, and J. Krupczak, $49,988.

National Science Foundation, EEC – 0341998, "A Case Study of an Established Technological Literacy Course,"
J. Krupczak, Leslie Wessman and Scott Vanderstoep, $74,884.

National Science Foundation, REU – 0097578, "Research Experience for Undergraduates in Physics and Engineering at Hope College," J. Krupczak, and P. Jolivette, $141,125.

National Science Foundation, CCD – 9752693, "Hands-on Laboratory Projects for Non-Engineers."
J. Krupczak, $68,210.

National Science Foundation ILI. – 9751210, "Enhancing Student Design Experiences by Integrating Computer-aided Engineering into the Curriculum," Darryl Thelen, and J. Krupczak, $65,351.

PUBLICATIONS

Krupczak J.J, M. Mina and M. Rands, "Using Design Thinking and Technological Domains to Assess Knowledge Transfer in Engineering Design," *2019 IEEE Frontiers in Education Conference* (FIE), Covington, KY, USA, 2019, pp. 1-5.

M. Mina and J. Krupczak, "ASEE TELPhE Division as a Community of Transformation," 2018 IEEE Frontiers in Education Conference (FIE), San Jose, CA, USA, 2018, pp. 1-5

Krupczak, J. (2018, July), *Workshop: Engineering Reasoning - An Approach to Increasing the Appeal of Introductory Engineering Courses to All Students* Paper presented at 2018 FYEE Conference, Glassboro, New Jersey. https://peer.asee.org/31439

Krupczak, J., & Mina, M., & Disney, K. A. (2017, June), *A Framework for an Engineering Reasoning Test and Preliminary Results*. Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, Ohio. https://peer.asee.org/27463

Blake, J. W., & Krupczak, J. (2017, June), *Engineering for Non-Engineers: Where We Stand at Colleges and Universities* Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, Ohio. https://peer.asee.org/28254

Krupczak, J., & Mina, M. (2016, June), *An Exercise to Promote and Assess Critical Thinking in Sociotechnical Context* Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana. 10.18260/p.26586

Krupczak, J., & Mina, M., & Disney, K. A. (2016, June), *Initial Results in Developing an Engineering Reasoning Assessment for General Education* Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana. 10.18260/p.25695

Krupczak, J., & Mina, M. (2015, June), *Work in Progress: An Approach to Engineering Literacy Emphasizing Components, Functions, and Systems* Paper presented at 2015 ASEE Annual Conference & Exposition, Seattle, Washington. 10.18260/p.25084

Krupczak, J., & Aprill, L., & Langholz, D. J. (2014, June), *Development of a Simplified Method for Representing Technological Systems for Non-Engineers* Paper presented at 2014 ASEE Annual Conference & Exposition, Indianapolis, Indiana. https://peer.asee.org/20309

Krupczak, J., & Bassett, G. (2013, June), *Abstraction as a Vector: Distinguishing Philosophy of Science from Philosophy of Engineering*. Paper presented at 2013 ASEE Annual Conference & Exposition, Atlanta, Georgia. https://peer.asee.org/19145

Krupczak, J., & Mina, M. (2013, June), *Gains in Engineering-Related Skills Achieved by Students in Technological and Engineering Literacy Minors* Paper presented at 2013 ASEE Annual Conference & Exposition, Atlanta, Georgia. https://peer.asee.org/19645

Krupczak, J., & Disney, K. A. (2013, June), *Technological Literacy: Assessment and Measurement of Learning Gains* Paper presented at 2013 ASEE Annual Conference & Exposition, Atlanta, Georgia. https://peer.asee.org/22545

Krupczak, J.J, and G. Bassett, "Work in Progress: Abstraction as a Vector: Distinguishing Engineering and Science," *Proceedings of the 42th ASEE/IEEE Frontiers in Education Conference*, October 3-6, 2012, Seattle, WA.

Krupczak, J.J., J. W. Blake, K. A. Disney, C. O. Hilgarth, R. Libros, Mani Mina, S.R Walk, "Defining Engineering and Technological Literacy," *Proceedings of the American Society for Engineering Education 2012 Annual Conference*, June 10-13, 2012, San Antonio, TX.

Krupczak J.J, M. Mina, R. Gustafson, J. Young, "Minors as a Means of Developing Technological and Engineering Literacy for Non-Engineers," *Proceedings of the American Society for Engineering Education 2012 Annual Conference*, June 10-13, 2012, San Antonio, TX.

Krupczak J.J, and K.A. Disney, "An Online Resource For Developing Technological Literacy Courses," *Proceedings of the American Society for Engineering Education 2011 Annual Conference*, June 26 - 29, 2011, Vancouver, BC, Canada.

Krupczak J.J, and K.A. Disney, "Development of Engineering Laboratory Projects for General Education Engineering Courses," Proceedings of the American Society for Engineering Education 2011 Annual Conference, June 26 - 29, 2011 Vancouver, BC, Canada.

Krupczak J.J, L. Aprill, and M. Mina, "Adaptations Of Concept Mapping For Technological Literacy Courses," *Proceedings of the American Society for Engineering Education 2011 Annual Conference*, June 26 - 29, 2011 Vancouver, BC, Canada.

Krupczak, J.J., "Using Functional Analysis as a Framework for Understanding Technology," *Proceedings of the American Society for Engineering Education 2010 Annual Conference*, June 20-23, 2010, Louisville, KY.

Krupczak, J.J, and K. Disney, "Portable Laboratories for General Education Engineering Courses," *Proceedings of the American Society for Engineering Education 2010 Annual Conference,* June 20-23, 2010, Louisville, KY.

Mina, M, J.J. Krupczak, R. Gustafson, J. Young, "Expanding Technological Literacy Through Engineering Minors," *Proceedings of the American Society for Engineering Education 2010 Annual Conference,* June 20-23, 2010, Louisville, KY.

Krupczak J.J, M. Mina, R. Gustafson, J. Young, "Development of Engineering-Related Minors For Non-Engineering Students," *Proceedings of the American Society for Engineering Education 2010 Annual Conference*, June 20-23, 2010, Louisville, KY.

Krupczak J.J., T. Simpson, V. Bertsch, K. Disney, E. Garmire, Seung Ki Moon, "*An Infrastructure to Facilitate the Creation of Courses on Technology and Engineering for Non-Engineers*," *Proceedings of the American Society for Engineering Education 2010 Annual Conference*, June 20-23, 2010, Louisville, KY.

Krupczak, J.J, Kate Disney, Scott VanderStoep, "*Work in Progress – Using Insights from Non-Engineers to Help Develop Laboratory Projects*," *Proceedings of the 39th ASEE/IEEE Frontiers in Education Conference*, October 18 - 21, 2009, San Antonio, TX.

Krupczak, J.J, K. Disney, and S. Vanderstoep, "*Laboratory Projects Appropriate For Nonengineers and Introduction to Engineering,"* Proceedings of the American Society for Engineering Education 2009 Annual Conference, June 17-19, 2009, Austin, TX.

Krupczak, J.J., "*New Developments In Engineering For Nonengineers: Functional Analysis as a Framework for Understanding Technology*," Proceedings of the American Society for Engineering Education 2009 Annual Conference, June 17-19, 2009, Austin, TX.

Disney, K. and J.J. Krupczak, "*Laboratory Projects Appropriate for Non-Engineers and Freshman Engineering Students*," *Proceedings of the Pacific Southwest Section of the American Society for Engineering Education 2009*, March 17-18, 2009, San Diego, CA.

Krupczak, J.J, T. Simpson, V.Bertsch, K. Disney, E. Garmire, B. Oakley, M. Rose, "Work in Progress – A Framework for Developing Courses on Technology and Engineering for All Students," *Proceedings of the 38th ASEE/IEEE Frontiers in Education Conference*, October 22 – 25, 2008, Saratoga Springs, NY.

Krupczak, J.J, K. Disney, and S. Vanderstoep, "Work in Progress - Using Insights from Non-Engineers to Improve Introduction to Engineering," *Proceedings of the 38th ASEE/IEEE Frontiers in Education Conference*, October 22 – 25, 2008, Saratoga Springs, NY.

Krupczak, J.J, T. Simpson, V.Bertsch, K. Disney, E. Garmire, B. Oakley, M. Rose, "A Framework for Developing Courses on Engineering and Technology for Non-Engineers, " *Proceedings of the American Society for Engineering Education 2008 Annual Conference*, June 22 - 25, 2008, Pittsburgh, PA.

Krupczak, J.J., D. Ollis, "Technology Courses for Undergraduates: Developing Standard Models," *Proceedings of the American Society for Engineering Education 2008 Annual Conference*, June 22 - 25, 2008, Pittsburgh, PA.

Krupczak, J.J., David Ollis , W. Bernard Carlson, J. Douglass Klein , Kathryn Neeley , W. Grant Norton , Barbara Oakley, Russell Pimmel, Greg Pearson, and James F. Young, "The Technological Literacy of Undergraduates: Developing Standard Models," *Proceedings of the 37th ASEE/IEEE Frontiers in Education Conference,* October 10 – 13, 2007, Milwaukee, WI.

Krupczak, J.J., "Using Insights from Non-engineers to Improve Introduction to Engineering via Functional Analysis," *Proceedings of the American Society for Engineering Education 2007 Annual Conference*, June 23-26, 2007, Honolulu, HI.

Krupczak, J.J., D. Ollis, "Technological Literacy and Engineering for Non-Engineers: Lessons from Successful Courses," *Proceedings of the American Society for Engineering Education 2006 Annual Conference*, June 18-21, 2006, Chicago, IL.

Pearson, G., J.J. Krupczak, D. Ollis, "Assessing Technological Literacy in the United States," *Proceedings of the American Society for Engineering Education 2006 Annual Conference*, June 18-21, 2006, Chicago, IL.

Krupczak, J.J., J. Heisler, T. Ludwig, R. Nemeth, J. Piers, and N. Sobania, "Recommendations for USA Faculty Members Teaching Liberal Education Courses in Japan, *Proceedings of the American Society for Engineering Education 2006 Annual Conference,* June 18-21, 2006, Chicago, IL.

Ollis, D., and J.J. Krupczak, "Teaching Technology Literacy: An Opportunity for Design Faculty," *Proceedings of the American Society for Engineering Education 2006 Annual Conference*, June 18-21, 2006, Chicago, IL.

Sidi-Yekhlef, A., Stohlman, O, J.J. Krupczak, "Analysis and Design of Helium Gas Warm Up for a 2K RF Cavity Cryomodule," *Brookhaven National Laboratory Technical Note*, November 11, 2005, (A/AP/224 11/05).

Krupczak, J.J., D. Ollis, R. Pimmel, R. Seals, G. Pearson, and N. Fortenberry, "The Technological Literacy of Undergraduates: Identifying the Research Issues," *Proceedings of the 35th ASEE/IEEE Frontiers in Education Conference*, October 19 – 22, 2005, Indianapolis, IN.

Krupczak, J.J., S. VanderStoep, L. Wessman, N. Makowski, C. Otto, K. Van Dyk, "Case Study of a Technological Literacy and Non-majors Engineering Course," *Proceeding of the 35th ASEE/IEEE Frontiers in Education Conference, October 19 – 22*, 2005, Indianapolis, IN.

Ollis, D., and J.J. Krupczak, "Teaching Technology Literacy: An Opportunity for Design Faculty," *International Journal of Engineering Education*, vol. 22, no. 3 (2006) 665-670.

Krupczak, J.J., "Reaching Out Across Campus: Engineers as Champions of Technological Literacy," Liberal Education in 21stCentury Engineering, *Worcester Polytechnic Institute Series on Studies in Science, Technology, and Culture*, H. Luegengbil, K. Neeley, and D. Ollis, editors, Peter Lang Publishers, New York, (2004).

Krupczak, J.J., Joseph Kaloust, Michael Misovich, Roger Veldman, Paul DeYoung, Peter Gonthier, Catherine Mader, and Mark Little, "Results from Replacing General Physics with Introduction to Engineering in the First Year," *Proceedings of the American Society for Engineering Education 2004 Annual Conference*, June 20-23, 2004, Salt Lake City, UT.

Krupczak, J.J., Christy Heid, Miguel Abrahantes, Tim Benson, Daniel Rodak, Jonathan Spaulding, "A Simple Loudspeaker Which Students Can Build and Take Home," *MSTA Journal, Michigan Science Teachers Association*, Fall (2004).

Krupczak, J. J., Nathaniel Makowski, LaToya Austin, Stephanie Ross, and Matthew Stolz. Electromagnetism Design Project for Middle School Students, *Proceedings of the American Society for Engineering Education North Central Section Spring Conference* (2004).

Krupczak, J.J, and G. Suzuki, I. Takahashi, K. Takayama, A. Ming, T. Miyazaki H. Takashima, "Similarities Between Current Engineering Education Problems in the United States and Japan," *Proceedings of the American Society for Engineering Education North Central Section Spring Conference* (2004).

A.Sherstov and J.J. Krupczak, "A Demonstration of CPU Organization Using a Simple Apparatus and Sixteen People," *Proceedings of the American Society for Engineering Education 2003 Annual Conference*, June 22-25, 2003, Nashville, TN.

Pinkerton LR., J.J. Krupczak et al., "An Apparatus to Measure Force in a Simple Truss System," *Proceedings of the 32nd ASEE/IEEE Frontiers in Education Conference*, November 7-9, 2002, Boston, MA.

Krupczak, J.J., Nathaniel Bair, Timothy Benson, Paul Berke, Dale Corlew, Kristen Lantz, Daniel Lappenga, Matthew Scholtens, and David Woessner, "Hands-on Laboratory Projects for Non-Science Majors: Learning Principles of Physics in the Context of Everyday Technology," *Proceedings of the American Society for Engineering Education 2000 Annual Conference*. June 18 - 21, 2000 Saint Louis, MO.

Krupczak, J.J, and D.T. Thelen, "Use of Personal Computer Workstations and Windows NT to Facilitate use of CAD and CAE in the Undergraduate Engineering Curriculum," *Proceedings of the American Society for Engineering Education North Central Section Annual Conference* (2000).

Krupczak, J.J and C. Green "The Perspective of Non-Engineers on Technological Literacy," *Proceedings of the American Society for Engineering Education 1999 Annual Conference*, June 20 - 23, 1999, Charlotte, NC.

Krupczak, J.J, B. Mulder, and J.D. vanPutten, "Multidisciplinary Student Experiences in a Liberal Arts Engineering Program," *Proceedings of the American Society for Engineering Education 1997 Annual Conference*. June 15-18, 1997, Milwaukee, WI.

Krupczak, J.J "Demystifying Technology," *American Society for Engineering Education PRISM,* October (1997) 30-34.

Krupczak, J.J "Science and Technology of Everyday Life: A course on technology for liberal arts students," *Proceedings of the American Society for Engineering Education 1996 Annual Conference*. June 23-26, 1996, Washington, D.C.

Krupczak, J. J., D.R. McAllaster, S.B. Crampton, A.L. Cole, and A.J. Kerman, "A Cryogenic Hydrogen Maser Operating at 10 K." *Advances in Cryogenic Engineering* 40 (1995) 286.

Krupczak, J.J., B. Dao, and A. Sidi-Yekhlef, "Thermal Program Cools Off Hot Problems," *Machine Design,* July 11, (1994) 86-88.

Deis G., R. Warren, D. Richied, N. Martovetsky, J.J. Krupczak, A. Sidi-Yekhlef, J. Pace, and C. Collins, "A Liquid Helium Cryogenic System Design for the GEM Magnet, " *Advances in Cryogenic Engineering*. 39 (1994) 389.

McAllaster, D.R., J.J. Krupczak, A.L. Cole, A. J. Kerman, and S.B. Crampton, "Cryogenic Hydrogen Maser at 10 Kelvin," *Proceedings of the 1994 IEEE International Frequency Control Symposium*, (1994).

Deis, G., J.Bowers, J.J. Krupczak, et al., "Overview of the Superconducting Magnet Subsystem for the GEM Detector at the SCC, *Fifth International Symposium on the Super Collider*, May 6-8, 1993 San Francisco, CA. (1993).

Deis, G., J.Bowers, J.J. Krupczak, et al., "The Superconducting Solenoid Magnet System for the GEM Detector at the SCC, *Thirteenth Magnet Technology Conference*, September 20-24, 1993, Victoria, British Columbia. (1993).

Shi D., J.J. Krupczak, M. Tang, N. Chen, and R. Bhadra, "Oxygen Diffusion and Phase Transformation in YBa2Cu3O7-x," *J. Appl. Phys.* 66, 4325 (1989).

Sidi-Yekhlef A, J.J. Krupczak, and J.E. Sunderland, "Distribution of a Static Charge in a Free Turbulent Jet," J. *Electrostatics* 22, 119 (1989).

Krupczak, J.J., P. Skillman, A. Brancic, and J.E. Sunderland, "Seasonal Storage of Solar Energy Using Insulated Earth," *Proceedings of the International Solar Energy Society,* INTERSOL 85 (1985) 806.

Seymour, R. J., J. J. Krupczak, and G. I. Stegeman, "High Efficiency Coupling to the Overcoated Surface Plasmon Mode in the Far Infra-Red," *Appl. Phys. Lett.*, 44, 373 (1984).

Crampton, S.B., J. J. Krupczak, and S. P. Souza, "Temperature Dependence of Hydrogen Atom Adsorption on Molecular-Hydrogen Surfaces," *Phys. Rev. B,* 27, 4383 (1982).

Crampton, S.B., J. J. Krupczak, and S. P. Souza, "Progress of the State-Selected Beam Low Temperature Hydrogen Maser," *Journal de Physique, Colloque* C8. 181 (1981).

AWARDS AND ACCOMPLISHMENTS

Hope College Outstanding Professor, 2009
(Awarded by vote of students in graduating class, 1 per year).

Founding Advisor, Hope College Student Chapter National Society of Black Engineers (NSBE) 2006 – present.
(Received Best New Chapter Award Region IV, 2007).