Antonette T. Cummings, P.E., PhD

Teaching Experience

Assistant Professor, *Mechanical Engineering, University of Wisconsin-Platteville* 8/2016 - present
Creating research-informed learning opportunities in-class and online for a diverse student population to prepare them for industry careers. Creating research-informed assessments for deep conceptual and procedural knowledge of mechanical engineering and design, for ABET assessment. Participating in the preservation and enhancement of a leading curriculum face-to-face and online. Courses: MECHENG 2630 Thermodynamics, MECHENG 3640 Heat Transfer, MECHENG 4980 Tiltrotor Design, GENENG 1030 Introduction to Engineering Projects, MECHENG 4940 Undergraduate Research.

Advisor, *EPICS, Purdue University* 8/2014 – 12/2015

Adjunct Professor, *Composite Materials Engineering, Winona State University* 2/2015 – 5/2015

Teaching Assistant, *EPICS*, *Purdue University* 8/2012 – 8/2014

Professional Development Activities

ABET Coordinator, Mechanical Engineering, *University of Wisconsin-Platteville* 1/2017 – present
Reviewed, analyzed, and summarized assessment data supplied by all faculty members for their courses. Reviewed student surveys and employer satisfaction surveys. Composed Criterion 4 Continuous Improvement chapter of the ABET self-study report. Experimented with refined assessment plan, including updated assignments and rubrics for direct assessment of student outcomes. Composed university assessment Form B for mechanical engineering department.

Representative, University Undergraduate Curriculum Commission, *University of Wisconsin-Platteville* 8/2021 - present

Co-chair, Assessment Showcase Day, *University of Wisconsin-Platteville* 8/2017 – 1/2018
Committee Member, Assessment Showcase Day, *University of Wisconsin-Platteville* 2/2017 – 5/2017
Developed university-wide showcase event on assessment, including speakers, workshops, and seed grants for team projects. Developed rubric for scoring grant proposals.

Engineering, Math, and Science New Faculty Learning Community, *University of Wisconsin-Platteville* 8/2016 – 5/2017

Research Experience

Primary Investigator, *University of Wisconsin-Platteville* 6/2017 – 6/2018
Employed qualitative research methods to develop learning interventions to increase student understanding of uncertainty in design. Proposed a three-phase research program for internal funding to hire undergraduate research assistants for summer and fall 2017. Trained undergraduate engineering student to conduct literature reviews, to describe and select appropriate qualitative research questions and methods, to analyze qualitative data, to think reflectively, and to compose conference papers.

Research Assistant, *Purdue University* 5/2014 – 12/2015
Conducted original Engineering Education research on the topics of students' understanding of engineering design, engineering leadership, and negotiation of ambiguity in design teams. Collaborated with peers and teams of research professors to plan, analyze, and publish research data.

Special Project*:* Ambiguity in Engineering Design*,* *Purdue University* 6/2013 – 8/2013

Selected Publications

Bridgeman, J. O., Cummings, A. T., Narramore, J. C., & Kisor, R. (2008). *Analysis of V-22 Rotor Blade Performance Enhancements for Improved Payload.* Paper presented at the 64th AHS Forum, Montreal, Quebec, Canada.

Cummings, A. (2020). *Correlation of student participation in practice exams and actual exam performance*. Paper presented at ASEE North Midwest Section Annual Conference, Ames, IA.

Cummings, A. (2015). *A Phenomenographic Study of How Aerospace Engineers Experience Uncertainty When Making Design Decisions.* (PhD), Purdue University, West Lafayette, Indiana.

Cummings, A. T., & Oakes, W. C. (2015). *Helicopter Aerodynamics and Design Course Developed from a Research Informed Framework.* Paper presented at the 122nd ASEE Annual Conference & Exposition, Seattle, WA.

Cummings, A. T., Oakes, W. C., & Zoltowski, C. B. (2016). *Phenomenography: A Qualitative Research Method to Inform and Improve the Traditional Aerospace Engineering Discipline*. New Orleans, Louisiana. https://peer.asee.org/27333

Cummings, A. T., Shi, L., & Koo, J. H. (2005). *Thermal Conductivity Measurements of Nylon 11-Carbon Nanofiber Nanocomposites.* Paper presented at the International Mechanical Engineering Conference and Exposition (IMECE), Orlando, Florida.

Cummings, A. T., Zoltowski, C. B., Hsu, M.-c., Cardella, M. E., & Oakes, W. C. (2014). *Immersive Experience Impact on Students' Understanding of Design.* Paper presented at the 121st ASEE Annual Conference and Exposition, Indianapolis, IN.

Mathews, J., Marty, & Cummings, A. T. *Mapping Design Processes to Practicing Engineers' Perceptions of Uncertainty in Aerospace Design*. Salt Lake City, Utah. https://peer.asee.org/30789

Workshops and Conferences

Streaming Video Courses at UW-PEP Workshop Jan 2019

Presented assessment strategies and learning management system tools to make assessment transparent to students for online course delivery.

STEM Discovery Day for Office of Multicultural Affairs, *University of Wisconsin-Platteville* July 2018

Delivered a 3 hour activity for pre-college students to expose the students to creativity, design, and mechanical engineering. Leveraged existing research-informed activities at low cost to the program.

Women in Engineering, Math, and Science*, University of Wisconsin-Platteville* 8/2016 – present

Hosted break-out sessions for high school-age girls to explore mechanical engineering. Hosted informal gatherings for college-age women to strengthen mentor relationships. Hosted meals in my home to build relationships with students. Invited speaker to LLC events.

Education

Doctor of Philosophy in Engineering Education *Purdue University* 12/2015

Master of Science in Mechanical Engineering *The University of Texas at Austin* 5/2005

Antonette T. Cummings, P.E., PhD

Bachelor of Science in Mechanical Engineering *The University of Texas at Austin* 8/2003

Professional Work Experience

Engineer Specialist, *Bell Helicopter Textron, Fort Worth, Texas* 6/2005 – 8/2012

Other Certifications

Professional Engineer #114234, *Texas Board of Professional Engineers*
Private Pilot License for Visual Flight Rules, Fixed Wing Aircraft and Helicopter
Earned Value Management System, *Bell Helicopter Textron Inc*
Six Sigma Green Belt, *Textron*

Memberships and Affiliations

American Society for Engineering Education – Officer in Aerospace Technical Division, 2016 – 2019
Positions: Program Chair 2017, Secretary/Treasurer 2018, Division Vice-Chair 2019
American Society of Mechanical Engineers
Vertical Lift Society (formerly American Helicopter Society)
Aircraft Owner and Pilot Association