Katherine Ramos

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Education

University of Notre Dame — Notre Dame, IN
PhD in Mechanical Engineering, GPA: 3.72 — May 2021
Minor in Computational Science and Engineering
Thesis Topic: "Advancing the Integrated Computational Materials Engineering Paradigm"
Advisor: Dr. Karel Matouš

University of Notre Dame — Notre Dame, IN
MS in Mechanical Engineering, GPA: 3.70 — Jan 2018

The University of Texas at El Paso — El Paso, TX
BS in Metallurgical and Materials Engineering, GPA: 3.97, *summa cum laude* — May 2014
Presidential Scholar, Michael & Susan Dell Foundation Scholar

Professional Experience

The University of Colorado Boulder — Boulder, CO
Assistant Teaching Professor – Paul M. Rady Department of Mechanical Engineering — Jan 2025 - Present
Associate Chair, Community Engagement and Outreach — Jul 2025 - Present

- Teaching hands-on project-based courses in the Mechanical Engineering department.
- Teaching engineering design in Computer-Aided Design & Fabrication, Statics and Structure, and Introduction to Engineering Computing courses.

Teaching Assistant Professor – Integrated Design Engineering — Aug 2021 - Jan 2025
Associate Director for Belonging, Outreach, and Support – Integrated Design Engineering — Aug 2023 - Aug 2024

- Supervised the Engineering Projects Course Assistants, organize community-building events for our program's students, and led recruitment efforts.
- Teaching engineering design through hands-on project-based courses including: First-Year Engineering Projects, Engineering Drawing, and Statics.

The University of Notre Dame — Notre Dame, IN
Instructor of Record – First Year Engineering Program – College of Engineering — Aug 2020 - May 2021

- Taught project-based courses and engineering programming courses.
- Collaborated with other instructors to develop course material; lectures, projects, homework, and examinations.

Teaching Experience

Statics and Structures — MCEN 2023
Assistant Teaching Professor, University of Colorado Boulder — S'25, Sum'25, F'25

- Teach project-based courses to introduce students to statics and structures.

Introduction to Engineering Computing — MCEN 1030
Assistant Teaching Professor, University of Colorado Boulder — S'25, S'26

- Teach engineering programming to introduce students to MATLAB and Python.

Computer-Aided Design & Fabrication — BMEN 1025
Teaching Assistant Professor, University of Colorado Boulder — F'24, F'25, S'26

- Teach project-based courses to introduce students to Computer-Aided Design via SolidWorks.

Engineering Projects — GEEN 1400
Teaching Assistant Professor, University of Colorado Boulder — Fall 2021 - Fall 2024

- Teach project-based courses to introduce students to design engineering.

Statics for Engineers GEEN 2851
Teaching Assistant Professor, University of Colorado Boulder Summer 2022, 2023, 2024

- Teach project-based courses to introduce students to statics.

Engineering Drawing GEEN 1017
Teaching Assistant Professor, University of Colorado Boulder Spring 2022 - 2024

- Teach project-based courses to introduce students to Computer-Aided Design via SolidWorks.

Engineering Programming EG 10116
Instructor of Record, The University of Notre Dame Spring 2021

- Taught two engineering programming sections to introduce students to MATLAB and Python.

Engineering Projects EG 10115
Instructor of Record, The University of Notre Dame Fall 2020

- Taught two project-based courses using SolidWorks to create engineering drawings and Excel to analyze data.

Leadership & Service

Community Engagement and Outreach Committee Boulder, CO
Associate Chair, University of Colorado Boulder Jul 2025 - Present

- Serving as Associate Chair of the Mechanical Engineering Community Engagement and Outreach Committee (CEOC).
- Organize and lead committee meetings and serve as lead for various CEOC initiatives including: Student Travel Grants, Action Grants, and the ME Fall Festival.

Diversity Equity & Inclusion Working Group Boulder, CO
Member, University of Colorado Boulder Aug 2024 - Jul 2025

- Served on the Mechanical Engineering's DEI working group and led organizing efforts for the ME 2024 Fall Festival.

Faculty Governance Council – CEAS Boulder, CO
Secretary, University of Colorado Boulder Aug 2023 - Present

- Serving as Secretary and At-Large Representative for the College of Engineering
- Teaching Affairs Committee Chair

Inclusive Culture Council – CEAS Boulder, CO
Member, University of Colorado Boulder Aug 2023 - Present

- Serving as the Integrated Design Engineering Program Representative
- Serving on the DEI Learning Committee and the CEAS Engagement Survey Team

Integrated Design Engineering Boulder, CO
Associate Director for Belonging, Outreach, and Support, University of Colorado Boulder Aug 2023 - Aug 2024

- Served as Associate Director overseeing the Engineering Projects Course Assistants Cohort & Training Program, community building events, and recruitment initiatives.
- Led the development of Bachelor's-Accelerated Master's Programs in collaboration with the Integrated Design Engineering Program and various units within the College of Engineering at CU Boulder.

Campos Student Center – CEAS Boulder, CO
Faculty Partner , University of Colorado Boulder Aug 2021 - Present

- Serve as a close faculty partner of the Campos Student Center (*formally Broadening Opportunities through Leadership and Diversity BOLD*) and faculty advisor of the student society, Society of Women Engineers
- Served on the Strategic Planning Working Group from February - May 2023

Society of Women Engineers – SWE Boulder, CO
Faculty Advisor, University of Colorado Boulder Aug 2021 - Present

- Serving as faculty advisor for the undergraduate and graduate sections of the Society of Women Engineers.
- Led efforts to establish the graduate section of SWE at CU Boulder in Fall 2021 with now over 30 active members.
- Secured a *($1,000)* DEI Action Grant in Fall 2024 from the Mechanical Engineering Department's DEI Working Group to establish an independent Graduate Section of SWE.

STEM Routes Boulder, CO

Faculty Advisor, University of Colorado Boulder Aug 2021 - Present

- Serving as the faculty advisor for the graduate-student led organization that seeks to create an inclusive and supportive community for students in STEM.

Society of Women Engineers – SWE Notre Dame, IN

Chapter President, Vice-Chair, and Member May 2016 - May 2021

- Directed the leadership team of 8, as vice-chair and later as President, to completely revamp the organization by implementing productivity tools such as *Slack*, *MailChimp*, and *G Suite*.
- Secured a yearly budget approval *(>$1,800)* for events providing resources leading to more women engineering students obtaining internships with companies and acquiring coveted positions upon graduation.
- Increased student participation year after year and acquired a 180% budget increase *(>$5,000)* as a result.

Association of Women in Science – AWIS Notre Dame, IN

Outreach Committee Member Jun 2016 - Oct 2016

- Organized funding committee to secure community financial support *(>$30,000)* for the inaugural Regional Women in Science Conference for female graduate students, which was the 1st of its kind in the Midwest region.
- Led 8 workshops for the Expanding Your Horizons conference aimed at introducing, inspiring, and educating middle school girls about careers in math, science, and engineering.

Graduate Educators Teaching STEM Notre Dame, IN

Community Outreach Ambassador Feb 2016 - May 2017

- Tutored and mentored 2 at-risk and underrepresented minority middle school students at the Robinson Community Learning Center for 2 consecutive semesters and later supported the program through SWE.
- Coached 3 students on math and reading skills in 1-on-1 sessions leading to improved STEM and reading proficiency.

Outreach Activities: LearningSphere Science Fair Judge – 2019, Expanding Your Horizons volunteer – 2017

Research Experience

The University of Notre Dame Notre Dame, IN

Graduate Research Assistant – Integrated Computational Materials Engineering Aug 2014 - May 2021

- Investigated the influence of microstructure and damage phenomenon on the effective mechanical response of composites using 3D image-based modeling techniques to enable faster research and development time cycles.
- Formulated and established a thorough non-destructive, 3D image-based analysis where reliable experimental and image processing frameworks provide insight to the optimization of material design at lower cost.
- Developed a multi-disciplinary data-driven experimental and computational framework to reduce product-to-market time frames of new materials using statistical characterization methods.

Intel Hillsboro, OR

Hardware Engineering Intern – Thermal and Mechanical Systems Engineering Sep 2017 - Dec 2017

- Led development of novel material used to improve device durability, increase performance, and drive down costs.
- Improved burst performance of laptop devices by 40% using novel thermal capacitance phase-change material.
- Incorporated the use of 3D printed design tools to achieve consistent and reliable results.

Los Alamos National Laboratory Los Alamos, NM

Research Intern – Materials Science and Technology Division May 2016 - Aug 2016

- Initiated and executed collaboration with a research team of 4 on an image-based modeling project formulating comprehensive non-destructive experimental and image analysis protocols to serve as a new streamlined standard.
- Extended this collaborative effort and protocols with a cross-country national laboratory, Argonne.

The University of Texas at El Paso El Paso, TX

Undergraduate Research Assistant – Metallurgical and Materials Engineering Jan 2014 - May 2014

- Investigated and proposed alternative materials and designs for a prosthetic knee providing failure preventative measures (*this work was part of a non-profit organization, LIMBS International, committed to developing affordable and high-quality prosthetic limbs for people living in underdeveloped nations.*)

University of California Santa Barbara Santa Barbara, CA

Summer Engineering Research Experience – Chemical Engineering Jun 2013 - Aug 2013

- Executed a comprehensive screening of materials by conducting controlled "living" free radical co-polymerizations where successful controlled co-polymerizations served as a baseline for continued research.

Army Research Laboratory Aberdeen, MD

Student Internship – Materials Engineering Jun 2012 - Aug 2012

- Performed quality control and studied mechanical property effects of innovative titanium hydride powders providing a cost-effective alternative to existing commercially available wrought titanium components.

Publications

Conference Papers

[1] Bielefeldt A, **Ramos K**, Tisdale J. "Sustainability in First-Year Engineering Design: A Collaborative Approach" (American Society for Engineering Education (ASEE) Rocky Mountain Section, May 15, 2024 - May 17, 2024).

[2] Bielefeldt A, Tisdale J, **Ramos K**, Soltys M. "Confidence, Identity, and Belonging Among Engineering and EngineeringInterested Students in a First-Year Engineering Design Course" (American Society for Engineering Education (ASEE) Rocky Mountain Section, May 15, 2023 - May 19, 2023), Dec. 7, 2023.

[3] Tisdale J, Bielefeldt A, **Ramos K**, Komarek R. "Range of Practices of Sustainability Incorporation into First-Year General Engineering Design Course." (American Society for Engineering Education (ASEE) Annual Conference Exposition, June 26, 2022 - June 29, 2022), Aug. 23, 2022.

Journals

[1] S. Lee, **K. Ramos**, and K. Matouš, "Numerical study of damage in particulate composites during high-strain rate loading using novel damage model", *Mechanics of Materials*, (2021).

[2] **K. Ramos** and K. Matouš, "Micro-computed tomography based experimental investigation of micro- and macro-mechanical response of particulate composites with void growth", *Philosophical Magazine*, 98, 3049-3071 (2018).

Conference Presentations

[1] Koch J, **Ramos K**, Keeling N. "Alternative Grading Strategies in Engineering Eduation" (American Society for Engineering Education (ASEE), Rocky Mountain Section Conference, May 14, 2025 - May 16, 2025).

[2] **Ramos K**, "Promoting Equity: A Process of Adopting Outcomes-Based Grading in Your Course" (American Society for Engineering Education (ASEE), Collaborative Network for Engineering Computing Diversity (CoNECD), Feb. 25, 2024 - Feb. 27, 2024).

[3] **K. Ramos**, S. Lee, and K. Matouš, "Co-designed Image-based Experimental and Computational Investigation of Damage in Particulate Composites", *15th U.S. National Congress on Computational Mechanics*, Austin, Texas, July 28-Aug. 01, 2019.

[4] **K. Ramos** and K. Matouš, "Linking Microstructure to the Effective Mechanical Response in Particulate Composites Subjected to Uniaxial Compression using X-ray Micro-CT", *55th Annual Technical Meeting of the Society of Engineering Science*, Madrid, Spain, October 10-12, 2018.

[5] **K. Ramos** and K. Matouš, "Using Micro-computed Tomography for Image-based Material Testing of Particulate Composites to Quantify Microscale Damage", *13th World Congress in Computational Mechanics*, New York City, NY, July 22-27, 2018.

[6] **K. Ramos** and K. Matouš, "Understanding Mechanical Response through Image-based Material Testing of Particulate Composites using Micro-tomography", *54th Society of Engineering Science*, Boston, MA, July 25-28, 2017.

[7] **K. Ramos** and K. Matouš, "Quantifying Microscale Damage through Image-based Material Testing of Particulate Composites using Micro-tomography", *14th U.S. National Congress on Computational Mechanics*, Montreal, Canada, July 17-20, 2017.

Honors & Awards

DEI Action Grant 2024
Mechanical Engineering at University of Colorado Boulder

Engineering for One Planet Mini-Grant Award 2023
American Society for Engineering Education (ASEE)

Graduate Scholarship Recipient 2019
Women & Hi Tech

Rising Stars Award 2019
Oden Institute for Computational Engineering and Sciences - University of Texas at Austin

Outstanding Graduate Student Teacher Award 2018
Kaneb Center for Teaching and Learning

GEM Ph.D. Engineering Fellow 2017
The National GEM Consortium, sponsored by Intel Corporation

Intel Foundation Scholarship Recipient 2016
Great Minds in STEM: HENAAC Scholars Program

Professional Training

Academic Leadership for Women in Engineering 2022
Society of Women Engineers

Just and Equitable Teaching Credential 2022
Center for Teaching and Learning, University of Colorado Boulder

UndocuAlly training 2022
Center for Inclusion and Social Change, University of Colorado Boulder

Professional Memberships

Professional Affiliations: American Society for Engineering Education (ASEE), Women & Hi Tech, Society of Women Engineers (SWE), Society of Hispanic Professional Engineers (SHPE)

Skills

Languages: English – native, Spanish – fluent
Programming Languages: C++, MATLAB Script, Python
Desktop Editing and Productivity Software: Microsoft Office, LATEX, Google , SolidWorks

References

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