

## Anna K. T. Howard

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[http://bit.ly/intro\\_A\\_Howard](http://bit.ly/intro_A_Howard)  
[http://bit.ly/mae206\\_youtube](http://bit.ly/mae206_youtube)  
[http://bit.ly/mae206\\_examples](http://bit.ly/mae206_examples)  
<http://bit.ly/2017coursepack>

### **Education:**

#### **Doctor of Philosophy in Aerospace Engineering**

- August 2001, The Pennsylvania State University
- Thesis Title: *The Aeromechanical Stability of Soft-Inplane Tiltrotors*
- Faculty Advisor: Edward C. Smith, Director, Rotorcraft Center of Excellence

#### **Masters of Arts in Mathematics**

- December 1994, The Pennsylvania State University
- Thesis Title: *Burge's Partition Theorems Proved By Recurrences*
- Faculty Advisor: George Andrews, Evan Pugh Professor of Mathematics

#### **Bachelor of Science with Highest Honors in Mathematics, Bachelor of Arts in Philosophy**

- May 1992, University of North Carolina at Chapel Hill
- Thesis Title: *The Evolution of Zermelo-Fraenkel Set Theory*
- Faculty Advisors: Keith Simmons, Professor of Philosophy, Johann Sonner, Professor of Mathematics

### **Work Experience:**

**North Carolina State University**, Department of Mechanical and Aerospace Engineering, Raleigh, NC (August 2005 - present)

- Teaching Professor, 1.0 FTE, August 2020 – present
- Teaching Associate Professor, 1.0 FTE, August 2014 – August 2020
- Teaching Assistant Professor, 1.0 FTE, Jan 2013 – August 2014
- Teaching Assistant Professor, 0.75 FTE, Jan 2008 – Dec 2012
- Teaching Assistant Professor, 0.5 FTE (contracted by semester), Aug. 2005 – Dec. 2007

Duties: teach 5-6 on-campus sections and 3-5 distance education sections of Statics per year (approximately 600 students), serve as the Coordinator for Statics in the department, develop teaching methods for addressing the needs of large enrollment sections, conduct research into innovative use of technology in the classroom, serve on committees in the department and university, advise undergraduate students regarding engineering opportunities and careers

**Lord Corporation**, Cary, NC (May 2003 – Mar. 2005), Mechanical Engineering Contractor

Duties: conduct development and verification testing of magnetostrictive linear position sensors including developing the analytical model, assist in developing and writing Lord and supplier specifications, assist in creating graphical user interfaces in Matlab for automating testing

**Pennsylvania State University**, Department of Aerospace Engineering, University Park, PA (Sept. 2001 – Dec. 2002), Postdoctoral Fellow

Duties: develop analytical model for helicopter Fluidlastic<sup>®</sup> lag dampers with Bell Helicopters, expand thesis research to model elastic blades to contribute stability analysis to VGARD project on extensible tip tiltrotors for Bell Helicopter Textron

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**Pennsylvania State University**, Department of Aerospace Engineering, University Park, PA (Sept. 2001 – Dec. 2002), Instructor, June 2001 – May 2002

Duties: develop and teach new freshman course: Hands-On Helicopters, seminar-style course to introduce first year students to engineering by studying vertical flight

***Journal Publications:***

- Howard, A.K.T. and Stimpson, M.J., “Online-Only Statics Compared to Flipped Class,” *Journal of Online Engineering Education*, vol. 9 (1), 2018.
- Howard, A.K.T. and Smith, E.C., “Prediction of Air and Ground Resonance Stability of Soft-Inplane Tiltrotors Using a Semispan Analytical Model,” *Journal of the American Helicopter Society*, vol. 53 (2), 2008.

***Refereed Conference Proceedings Papers:***

- Dashti, A., Howard, A.K.T., “No Homework Assignments to Improve Students’ Performance in Exams.” *Proceedings of the 2023 American Society for Engineering Education Annual Conference & Exposition*, Baltimore, MD, June 2023. [abstract accepted]
- Saul, K.R., Howard, A.K.T., Webster, Z., Spencer, D. “An Adaptive Learning Engineering Mechanics Curricular Sequence.” *Proceedings of the 2022 American Society for Engineering Education Annual Conference & Exposition*, Minneapolis, MN, June 2022.
- McCandless, B.A., Howard, A.K.T. “Adapting Entrepreneurial Mindset Projects for Large Classes.” *Proceedings of the 2022 ASEE Southeast Section Conference*, Charleston, SC, March 13-15, 2022.
- Patil, N., Howard, A.K.T., “Student Projects to Improve Student Proficiency with Three-Dimensional Vectors.” *Proceedings of the 2022 ASEE Southeast Section Conference*, Charleston, SC, March 13-15, 2022.
- Howard, A.K.T. “Building Community in an Online-Only Statics Class.” *Proceedings of the 2021 ASEE Southeast Section Conference*, online in Attendify, March 7-10, 2021.
- Howard, A.K.T. and Calamas, D. “Undergraduate Student Preferences Regarding Textbook Medium.” *Proceedings of the 2019 ASEE Southeast Section Conference*, Auburn, AL, March 8-10, 2020.
- Howard, A.K.T. “Flipped Classroom – Ten Years Later.” *Proceedings of the 2019 American Society for Engineering Education Annual Conference & Exposition*, Tampa, FL, June 2019.
- Howard, A.K.T. “Work in Progress: 3-D Models with Lesson Plans.” *Proceedings of the 2019 American Society for Engineering Education Annual Conference & Exposition*, Tampa, FL, June 2019.
- Howard, A.K.T. “Teaching Statics Using Agile Methodologies.” *Proceedings of the 2018 American Society for Engineering Education Annual Conference & Exposition*, Salt Lake City, UT, June 2018.
- Howard, A.K.T. and Zellweger, M. “Assessing Teamwork in Large Classes,” *Proceedings of the 2018 ASEE Southeast Section Conference*, Daytona Beach, FL, March 4-6, 2018.
- Howard, A.K.T., Pankow, M.S, and Peters, K. “NC State Undergraduate Research for Composites in Extreme Environments, Second Year Study,” *Proceedings of the 2018 ASEE Southeast Section Conference*, Daytona Beach, FL, March 4-6, 2018.
- Howard, A.K.T. and Stimpson, M. “Online-Only Statics Compared to a Flipped Classroom,” *Proceedings of the 2017 American Society for Engineering Education Annual Conference &*

- Exposition, Columbus, OH, June 2017.
- Howard, A.K.T. “New Video Tool for Demonstrations in Distance Education Statics”, ASEE Zone II Conference, San Juan, PR, March 2017. (Thomas C. Evans Instructional Paper Award winner)
- Howard, A.K.T. “Demonstrations for Class Time for Flipped Statics.” Proceedings of the 2016 ASEE Southeast Section Conference, Tuscaloosa, AL, March 13 - 15, 2016.
- Jensen, M., and Howard, A.K.T. “Flipped Classes: Do Instructors Need to Reinvent the Wheel When it Comes to Course Content?” Proceedings of the 2015 American Society for Engineering Education Annual Conference & Exposition, Seattle, WA, June 2015.
- Howard, A.K.T., “Enhancing Student Engagement in Engineering Statics with Online Tools,” ASME 2010 International Mechanical Engineering Congress & Exposition, Vancouver, BC, Canada, November 12-18, 2010.
- Howard, A.K.T., “The Influence of Aeroelastic Couplings on Ground and Air Resonance Stability of a Soft-Inplane Tiltrotor,” AHS Rotorcraft Dynamics and Aeromechanics Specialists Meeting, Atlanta, GA, November 13–15, 2000.
- Howard, A.K.T., “Aeromechanical Stability of Soft-Inplane Hingeless Tiltrotors,” 8th ARO Workshop on Aeroelasticity of Rotorcraft Systems, University Park, PA, October 18–20, 1999.

***Presentations and Poster Sessions:***

- Howard, A.K.T. “Lessons Learned: Ten Years of Flipping a Course.” 2020 Teaching and Learning Symposium, NCSU, February 28, 2020.
- Howard, A.K.T., and Jensen, M., “Don’t Reinvent the Wheel: It’s OK to Use One Another’s Videos!” Teaching and Learning Symposium, NCSU, April 14, 2015.
- Howard, A.K.T., “Instructional Videos -- Three Kinds of Videos to Meet Different Student Needs,” Teaching and Learning Symposium, NCSU, April 4, 2012.
- Howard, A.K.T., and Howard, D. L., “Better Menu Organization for Online Courses,” 12th Annual UNC Teaching and Learning with Technology Conference, Presented in Second Life by UNC-Pembroke, April 12-14, 2011.
- Howard, A.K.T., and Temple, T., “STEM Example Problems on the Web using Livescribe PulsePen,” 11th Annual UNC Teaching and Learning with Technology Conference, Presented in Second Life by UNC-Pembroke, April 13-15, 2010.
- Howard, A.K.T., “Tiltrotor Air and Ground Resonance: Full-Span Model with Fuselage Motion.” Ninth ARO Workshop on Aeroelasticity of Rotorcraft Systems, University of Michigan, Ann Arbor, MI, October 22-24, 2001.
- Howard, A.K.T., “The Aeromechanical Stability of Soft-Inplane Tiltrotors.” Thesis presentation, Penn State University, May 1, 2001.
- Howard, A.K.T., "Aeroelastic Tailoring in Soft-Inplane Hingeless or Bearingless Tiltrotors." AHS Lichten Competition, Northeast Region, Philadelphia, January 27, 1999.
- Howard, A.K.T., "Aeromechanical Stability of Soft-Inplane Hingeless Tiltrotors." Eighth ARO Workshop on Aeroelasticity of Rotorcraft Systems, Penn State University, University Park, PA, October 18-20, 1999.

### ***Membership in and Service to professional organizations:***

- American Society of Engineering Education, member 2001 – 2003, 2013 – present
  - National ASEE, Mechanical Engineering Division:
    - Division Chair, 2022 – present
    - Program Chair, 2021 – 2022
    - Program Chair-Elect, 2020 – 2021
    - Secretary/Treasurer, 2019 – 2020
    - Poster Reviewer, 2019
    - Awards Committee Chair, 2017 – 2019, Member 2016 – 2017
    - Paper reviewer 2017 – 2021
  - National ASEE, Mechanics Division:
    - Director, 2021 – 2024
    - Director, 2016 – 2019
    - Paper Reviewer 2017 – 2021
  - Campus Representative, 2020 – present
  - Southeast Section Conference Host Site Coordinator for Section Conference, 2018 – 2019
    - Conference Planning Team: 2020 – 2021, 2021 – 2022
  - Southeast Section:, Programs Unit
    - Vice-Chair & Technical Program Chair, 2022 – present
    - Secretary, Programs Unit, 2021 – 2022
  - Southeast Section, Publications and Promotions Unit
    - Vice President and Chair, 2021 – 2022
    - Vice-Chair, 2020 – 2021
    - Secretary, 2019 – 2020
  - Southeast Section: Research Division
    - Chair and Poster Session Chair (canceled due to Covid), 2020 – 2021
    - Vice-Chair, Research Division, 2019 – 2020
    - Secretary, 2018 – 2019
  - Southeast Section: Mechanical Engineering Division
    - Chair, 2018 – 2019, assigned reviewers
    - Vice-Chair, 2017 – 2018
    - Secretary, 2016 – 2017
  - ASEE Zone II: Paper reviewer for Division Meeting, 2016
- Engineering Unleashed Community, 2020 – present
  - Champion on campus – spearheaded NC State becoming a KEEN Partner School
- National Center for Faculty Development & Diversity, 2016 – present
- The Vertical Flight Society (previously the American Helicopter Society), 1992 – 2021
- NC Engineering Pathways program: Consultant for Statics curriculum, 2013 – 2016
- Golden Leaf Opportunities for Work-Aerospace Manufacturing, Lead for Statics Team, 2010 – 2013

### ***Honors and Awards:***

- ASEE Southeast Section, Tilmans-Dion Section Service Award, 2022
- NC Engineering Pathways invited plenary speaker, 2022
- Craven Community College Graduation Speaker, 2021 (NC State-Havelock MES degree.)
- Southeast Section Nominee for ASEE National Teaching Medal, 2019

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- ASEE Southeast Section Outstanding Teaching Award, 2018
- 2018 ASEE-SE Best Conference Paper
- Thomas C. Evans Outstanding Paper for ASEE-SE, 2016
- Thank a Teacher, NCSU, 2018, 2017, 2014, 2011
- Virtual Community of Practice with ASEE, Spring and Fall 2013
- Certificate of Reflective Teaching Program, Spring 2012 – Spring 2013: 8 workshops, six-week reading circle with university faculty, capstone project and poster
- AHS Vertical Flight Society Membership Award, 2009, 2011
- Gertrude M. Cox Award for Innovative Excellence in Teaching and Learning with Technology, February 2010
- ASME NCSU Student Chapter Golden Whip Award, April 2009 and April 2010
- ASME NCSU Student Chapter Crankshaft Award, April 2008
- Weiss Graduate Scholars Program Fellow, 2000
- NASA Graduate Student Researcher's Program Fellowship, 1995, 1996, 1997, and 1998
- Amelia Earhart Scholarship, 1996
- Vertical Flight Foundation Scholarship, 1995 and 1996
- Curry Fellowship in Mathematics, 1992

### ***Research Project Record***

- *Wolf Pack KEEN EM Annual Support Program 2022-2023*, Kern Family Foundation (\$25,000), Joel Ducoste, Anna Howard, Duration 2022-2023.
- *Building Entrepreneurial Mindset Champions at NC State University*, Kern Family Foundation (\$135,077), Anna Howard, Kate Saul, Nathalie Levoine, Duration: 2022-2024.
- *CUE: Collaborative Research: Effective Peer Teaching Across Computing Pathways*, National Science Foundation (\$148,864 total), Sarah Heckman, Lina Battestilli, Anna Howard – NC State University; Kristy Boyer, Maya Israel – University of Florida; Ketan Mayer-Patel, David Gotz – University of North Carolina Chapel Hill; Kristin Stephens-Martinez, Karen Murphy – Duke University, Duration: 2020-2021.
- *Facilitating Entrepreneurial Mindsets for Mid-Career Engineering Faculty*, Arizona State University (Prime - Kern Family Foundation), Co-PIs Christine Grant and Anna Howard. (\$49,877). Duration: 2019-2021.
- *Open Textbook Grant*, (\$2000), PI: Anna Howard, NC State Libraries. Duration: 2020
- *REU SITE: Summer Internships in Composites for Extreme Performance*, National Science Foundation (\$252,096), PI: Kara Peters, Co-PI Anna Howard and Mark Pankow, Duration: 3/17 – 12/18. Renewal under consideration with Anna Howard as PI.
- *Statics -- Books, Captions, Homework, & Stars*, (Innovation in Distributed Education Applications (IDEA) Grant, NC State University, Distance Education and Learning Technologies Applications (\$8,000), PI: Anna Howard, Duration: 2013-2014
- Peer Coaching Program, NC State University, Office of Faculty Development (\$1,000) Duration: 1/1/2012 – 6/30/2012 (Though grant has ended, participation is continuing.)
- *Building Engineering Pathways, Through Engineering Physics and Introduction to Engineering Courses" and "Building Engineering Pathways, Through an Engineering Statics Courses*, Golden Leaf Opportunities for Work --Aerospace Manufacturing (total grant: \$214,950), PI: Jerome Lavelle and Paul Kauffmann, ECU, Leads on Statics Task Group: Anna Howard and David Parish, CE, Duration: 03/01/2010 – 12/31/2011 (Though grant has ended, participation is continuing.)
- *Transforming Undergraduate Education in Science, Technology, Engineering and*

- Mathematics (TUES)*, National Science Foundation, PI: Lisa McNair, VaTech, Anna Howard, consultant, Duration: 07/14/11 – 12/31/11
- *Large Course Redesign of MAE 206 Engineering Statics and MAE 208 Engineering Dynamics*, NC State University, Distance Education and Learning Technologies Applications (\$12,000), PI: Anna Howard, Duration: 08/01/2009 – 6/30/2010
  - *Math Review with Pre/Post Testing for MAE 206 Engineering Statics Students*, NC State University (\$500), PI: Anna Howard and Alina Duca, Mathematics, Duration: 12/15/2009 – 12/31/2009
  - Computing Across the Curriculum Fellowship, NSF (multi-year large grant, \$1000 per individual participant), PI: Larry Silverberg, et al, Duration: 08/01/2008 – 12/31/2008
  - *Large Course Redesign of MAE 206 Engineering Statics and MAE 208 Engineering Dynamics*, NC State University, Distance Education and Learning Technologies Applications (\$10,000), PI: Anna Howard, Duration: 08/01/2008 – 12/31/2008
  - *Two Pilot Projects for Scalability in Engineering Instruction: Free-Body Diagrams and Instructor-led Example Problems*, University of North Carolina General Administration (\$41,450), PI: Anna Howard, Duration: 05/15/2008 – 12/31/2008
  - *Large Course Redesign of MAE 206 Engineering Statics and MAE 208 Engineering Dynamics*, NC State University, Distance Education and Learning Technologies Applications (\$10,000), PI: Anna Howard, Duration: 03/05/2008 – 06/31/2008

**Professional service on campus:**

- IT-GOV Educational Technology Committee Chair, 2022 – present, member 2020-2022
- Mechanical and Aerospace Engineering Professional Track Faculty Search Committee, 2021 – present
- Engineering Expansion Committee in Mechanical and Aerospace Engineering, 2022 – present
- Mechanical Engineering Career Advisor, 2016 – present (co-authored departmental career advising materials)
- Mechanical Engineering Curriculum Committee, 2013 – present
- MAE 206 Engineering Statics Course Coordinator, 2008 – present
- College of Engineering Teaching Professors Learning Community, 2011 – present
- Mechanical and Aerospace Engineering ABET committee, 2021 – 2022
- Associate Director for Engineering Faculty Advancement Search Committee, 2021 – 2022
- Oversight Committee for Leadership Review of Mechanical and Aerospace Engineering, 2021 – 2022
- Oversight Committee for Leadership Review of Academic Affairs in the College of Engineering, 2020 – 2021
- Engineering Education Department Working Group, 2015 –2016, 2020 – 2021
- Provost's Standing Committee for the Evaluation of Teaching, 2016 – 2020, Chair, 2018 – 2019  
Nominated by Faculty Senate for second three-year term as their representative, 2019  
(Resigned 2020 due to scheduling conflicts with assigned teaching.)
- Gertrude Cox Award Reviewer, 2012, 2018 – 2019
- ITSAC-ATC Physical Learning Environment Working Group, 2013 – 2019
- Mechanical and Aerospace Engineering Robotics/Autonomous Vehicles Search Committee, 2017 – 2018
- Mechanical and Aerospace Engineering Awards Committee, 2017 – 2018
- Mechanical and Aerospace Engineering Teaching Forum Committee, 2014 – 2018
- Mechanical and Aerospace Engineering Department Head Search Committee, 2016 –2017

- Mechanical and Aerospace Engineering Teaching Forum Chair, 2013 – 2014, 2016 – 2017
- College of Engineering TA Training, co-chair, 2015 – 2016
- COE College Leadership Survey Committee (Dean’s Five-Year Review), Chair, 2015 – 2016
- Office of Faculty Development partner, brainstorming course redesign, 2013
- Faculty Advisor, AHS Student Chapter, 2008 – 2013
- Peer Coach, Office of Faculty Development, 2011, 2012, 2013
- Flipping the Classroom Committee, 2012

### ***Professional References***

#### Srinath Ekkad

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#### Edward C. Smith, Ph.D.

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 Professor, Dept. of Aerospace Engineering,  
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 Associate Dean of Faculty Advancement  
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#### Donna T. Petherbridge, Ed.D.

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#### Todd Schweisinger, PHD, PE

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