

Julian Ly Davis

Associate Professor of Engineering

University of Southern Indiana
8600 University Boulevard
Evansville, IN 47712
(812) 461-5489

Email: julian.ly.davis@usi.edu
ORCID: 0000-0003-4109-3904
Scopus Author ID: 36738897000

Experience

- | | |
|--------------|---|
| 2016-Present | Associate Professor of Engineering, University of Southern Indiana (USI), Evansville, IN <ul style="list-style-type: none">• ME395 Introduction to the Finite Element Method• ME363 Vibrations• ENGR355 Strength of Materials• ENGR237 Survey of Computational Methods in Engineering• ENGR235 Statics• ENGR107 Fundamentals of Engineering• ME366 Dynamics of Machinery• ME365 Modeling Dynamic Systems• ME225 Thermodynamics• ENGR291 Experimental Design and Technical Communication• ENGR275 Dynamics• ENGR108 Systems Engineering and Freshman Design• UNIV101 Freshman Seminar |
| Summer 2024 | Visiting Distinguished Engineer Los Alamos National Labs Dynamics Summer School, Los Alamos, NM |
| 2022-2023 | Virginia Merrill Bloedel Traveling Scientist University of Washington (UW), Seattle, WA, Faculty Sponsor: Joseph A. Sisneros |
| 2010-2016 | Assistant Professor of Engineering, USI, Evansville, IN (Teaching experience - similar to above) |
| 2008-2010 | Post Doctoral Research Associate, University of Massachusetts (UMass), Amherst, MA |
| 2008-2009 | Instructor, UMass, Amherst, MA <ul style="list-style-type: none">• MIE397B System Dynamics |
| 2008 | Adjunct Professor of Engineering, New River Valley Community College, Christiansburg, VA <ul style="list-style-type: none">• EGR245 Engineering Mechanics - Dynamics |
| 2008 | Post Doctoral Research Associate, Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA |
| 2007 | Ph.D. Engineering Mechanics, Virginia Tech, Blacksburg, VA,
<i>Dissertation: A Computational Study into the Effect of Geometry and Orientation of the Utricle of a Red Ear Slider Turtle on Hair Bundle Stimulus,</i> Advisor: J. Wally Grant |
| 2000-2007 | Graduate Research Assistant, Virginia Tech, Blacksburg, VA |
| 1999 | B.S. Engineering Science and Mechanics, Minor: Mathematics, Virginia Tech, Blacksburg, VA, <i>Thesis: Design of a Smart Fluid Rankine Cycle,</i> Advisor: Mark S. Cramer |

Research

Peer-Reviewed Publications

(♥ indicates USI student)

- 2024 **Davis, J.L.**, Baisley, A., Recktenwald, G.D., Self, B.P. & Cornwell, P.J., *A Modified Concept Inventory for Dynamics*, American Society of Engineering Education, Portland, OR.
- 2024 **Davis, J.L.** & Hill, A.J., *Analysis of Student Understanding of Force Using the Dynamics Concept Inventory, Think-Alouds and Confusion Matrices*, American Society of Engineering Education, Portland, OR.
- 2024 Rezvani, M.R. & **Davis, J.L.** , *Exploring Student Perceptions of Learning Experience in Fundamental Mechanics Courses Enhanced by ChatGPT*, American Society of Engineering Education, Portland, OR.
- 2024 Baisley, A., & **Davis, J.L.**, & Recktenwald, G.D., *Different Teaching Styles and the Impacts on Test Design for Dynamics*, American Society of Engineering Education, Portland, OR.
- 2023 Rogers, L.S., Lozier, N., Sapozhnikova Y., Diamond, K., **Davis, J.L.** & Sisneros, J.A. *Functional plasticity of the swim bladder as an acoustic organ for communication in a vocal fish*, Proceedings of the Royal Society B.
- 2023 **Davis, J.L.** & Hill, A.J., *Confusion Matrix Analysis of Student Think-Alouds during a Dynamics Concept Inventory Exam: Work in Progress for Two Questions*, American Society of Engineering Education, Baltimore, MD.
- 2023 **Davis, J.L.** & Hill, A.J., *Did the COVID-19 Pandemic affect student performance on exams in a Dynamics course?*, American Society of Engineering Education, Baltimore, MD.
- 2023 Smith A.L., **Davis, J.L.**, Panagiotopoulou, O., Taylor, A.B., Robinson, C., Ward, C.V., Kimbel, W.H., Zeresenay, A. & Ross, C.F., *Does the model reflect the system? When two-dimensional biomechanics is not “good enough”* Journal of The Royal Society Interface.
- 2021 Smith A.L., Robinson, C., Taylor, A.B., Panagiotopoulou, O., **Davis, J.L.**, Ward, C.V., Kimbel, W.H., Zeresenay & Ross, C.F., *Comparative biomechanics of the Pan and Macaca mandibles during mastication: Finite element modeling of loading, deformation and strain regimes*. Interface Focus.
- 2021 **Davis, J.L.**, McDonald T.N. & Kicklighter, B.L., *Online Testing with Blackboard – Lessons Learned (Perspective from 3 Engineering Faculty)*, American Society of Engineering Education, Long Beach, CA. (Virtual)
- 2021 Arena, S.L. & **Davis, J.L.**, *The concept-specific effects of cooperative learning in an introductory engineering mechanics dynamics course*, Innovations in Education and Teaching International. 58 (4): 387–397
- 2020 **Davis, J.L.** & Arena S.L., *Implementation of a Dynamics Concept Inventory – Before and After a Dynamics Class*, American Society of Engineering Education, Montreal, Canada. (Virtual)
- 2019 **Davis, J.L.**, McDonald T.N. & Kicklighter, B.L., *It’s not a matter of time! (A work in progress)*, American Society of Engineering Education, Tampa Bay, FL.
- 2019 **Davis, J.L.**, McDonald T.N. & Kloosterman, J.L., *Students - Ask them to eat their Steaks!*, American Society of Engineering Education, Tampa Bay, FL.

- 2019 Cost, I.N. , Middleton, K.M., Sellers, K.C., Echols, M.S., Witmer, L.M., **Davis, J.L.** & Holliday, C.M., *Palatal biomechanics and its significance for cranial kinesis in Tyrannosaurus Rex* , Anatomical Record.
- 2018 McDonald T.N. & **Davis, J.L.**, *Students - Ask them to eat their vegetables!*, American Society of Engineering Education, Salt Lake City, UT.
- 2017 Smith, N. & **Davis, J.L.** *Collaborating with Industry Partner within an Undergraduate Finite Element Course*, American Society for Engineering Education, Columbus, OH.
- 2017 **Davis, J.L.** & Chlebowski, A.C. *Work in Progress: Oh ... The Irony: A Six-Section Rube Goldberg Machine for Freshman Engineering Design*, American Society for Engineering Education, Columbus, OH.
- 2017 Sellers, K.C., Middleton, K.M., **Davis, J.L.** & Holliday, C.M. *Ontogeny of Bite Force in a Validated Biomechanical Model of the American Alligator*, Journal of Experimental Biology.
- 2016 Goodman, K.D., **Davis, J.L.** & McDonald T.N., *Effect Of A 'Look-Ahead' Problem On Undergraduate Engineering Students' Concept Comprehension*, American Journal of Engineering Education.
- 2016 Arena, S.L., **Davis, J.L.**, Grant, J.W., Madigan, M.L. *Tripping elicits earlier and larger deviations in linear head acceleration compared to slipping*, PLoS One.
- 2016 McDonald T.N. & **Davis, J.L.**, *Can enforcing an organized solution lead to better grades?*, American Society of Engineering Education, New Orleans, LA.
- 2016 **Davis, J.L.** & McDonald, T.N., *Online, Handwritten or Hybrid Homework: Whats best for our students in the long run?*, Journal of Online Engineering Education, 7(1).
- 2016 Smith, N.L. & **Davis, J.L.**, *Connecting Theory and Software: Experience with an Undergraduate Finite Element Course*, Computers in Engineering Education Journal, 7(2).
- 2015 Chlebowski, A.C., **Davis, J.L.** & Mitchell, Z.W. *Team Grouping Strategies in Freshman Engineering Design Courses.*, First Year Engineering Experience Conference, Roanoke/Blacksburg, VA.
- 2015 Arena, S.L., **Davis, J.L.**, Grant, J.W., Madigan, M.L. *Head Accelerations After Slipping and Tripping Exceed Those During Walking.* American Society of Biomechanics, Columbus, OH.
- 2015 Smith, N.L. & **Davis, J.L.** *Connecting Theory and Software: Experience with an Undergraduate Finite Element Course.* American Society of Engineering Education, Seattle, WA.
- 2015 Field, B.S., **Davis, J.L.**, Taylor, E.M.[∞], Volz, L.J.[∞], & McCloud, E.S. *A device for measuring the flexural stiffness of insect wings, or How to make a wing-bar gizmo.* Indiana Academy of Sciences.
- 2014 **Davis, J.L.** & Smith, N.L. *Connecting Finite Element Modeling With Strengths of Materials and Vibrations Using Beam Experiments.* ASME 2014 International Mechanical Engineering Congress and Exposition.
- 2014 **Davis, J.L.** & Grant, J.W. *Turtle utricle dynamic behavior using a combined anatomically accurate model and experimentally measured hair bundle stiffness.* Hearing Research.
- 2014 **Davis, J.L.** & McDonald, T.N. *Online Homework: Does it help or hurt in the long run?* American Society for Engineering Education, Indianapolis, IN.

- 2014 Grosse, I.R., Huang, L., **Davis, J.L.**, & Cullinane, D. *A Multi-Level Hierarchical Finite Element Model for Capillary Failure in Soft Tissue*. ASME Journal of Biomechanical Engineering.
- 2012 Rivera, A.R., **Davis, J.L.**, Grant, J.W., Blob, R.W., Peterson, E.H., Neiman, A.B., Rowe, M.H. *Quantifying Utricular Stimulation During Natural Behavior*. Journal of Experimental Zoology Part A: Ecological Genetics and Physiology.
- 2012 **Davis, J.L.** & Diersing, R.W. *Systems engineering and freshman design: Reinforcing systems engineering methods and technical communication through project based learning*. Conference on Higher Education and Pedagogy, Virginia Tech, Blacksburg, VA.
- 2011 **Davis, J.L.**, Dumont, E.R., Strait, D.S., & Grosse, I.R. *An efficient method of modeling material properties using thermal diffusion analogy: an example based on cranio-facial bone*. PLoS One.
- 2010 Dumont, E.R., **Davis, J.L.**, Grosse, I.R. & Burrows, A. *Finite Element Analysis of Performance in the Skulls of Marmosets and Tamarins*. Journal of Anatomy.
- 2010 Santana, S.E., Dumont, E.R., **Davis, J.L.** *Mechanisms of bite force production and their relationship to diet in bats*. Journal of Functional Ecology.
- 2010 **Davis, J.L.**, Santana, S.E., Dumont, E.R., Grosse, I.R. *Predicting Bite Force in Mammals: 2D vs. 3D Lever Models*. Journal of Experimental Biology.
- 2007 **Davis, J.L.**, Xue, J., Peterson, E.H. & Grant, J.W. *Layer Thickness and Curvature Effects on Utricle Deflection in the Red Ear Slider Turtle: Static and Dynamic Analysis*. Journal of Vestibular Research, 17(4): 145–162.

Abstracts & Presentations

(♥ indicates USI student)

- 2024 Rosenbluth, O.R., Berger, E.K.♥, **Davis, J.L.**, Rogers, L.S. and Sisneros, J.A., *VImpulse Response of Female Midshipman Swim Bladder*, Society for Integrative and Comparative Biology, Seattle, WA.
- 2023 **Davis, J.L.**, Balebail S. & Sisneros J.A. , *Vibration Analysis Reveals the Fish Saccule Behaves as a Velocimeter Near it's Natural Frequency*, Association for Research in Otolaryngology - 46th Annual MidWinter Meeting, Orlando, FL.
- 2019 Land, Z.M.♥, Jones, J.♥, Curthoys, I.S., Grant, J.W. & **Davis, J.L.**, *Guniea Pig Saccule Finite Element Model; Spanning the Dynamic Range of VEMP Testing*, Association for Research in Otolaryngology - 42nd Annual MidWinter Meeting, Baltimore, MD.
- 2018 Land, Z.M.♥, **Davis, J.L.**, Curthoys, I.S., Grant, J.W. *Utricle Finite Element model; Implications at VEMPs Stimulation Frequencies*, Association for Research in Otolaryngology - 41st Annual MidWinter Meeting, San Diego, CA.
- 2017 Holliday, C.M., Hill, C.A., **Davis, J.L.**, Witmer, L.M. & Middleton K.M., *Inside Dinosaurs: A Broader Impacts Program for Research, Teaching and Public Education Through Dinosaur Biology, Physics and Evolution*, The FASEB Journal vol. 31 no. 1 Supplement 734.8
- 2017 Wilken, A.T., Middleton, K.M., Sellers, K.C., Cost, I.N., **Davis, J.L.** & Holliday, C.M., *Modeling Complex Cranial Joints in Varanus exanthematicus* The FASEB Journal vol. 31 no. 1 Supplement 579.1

- 2017 Sellers, K.C., Middleton, K.M., **Davis, J.L.** & Holliday, C.M., *Biomechanics and the Evolution of the Crocodyliform Skull* The FASEB Journal vol. 31 no. 1 Supplement 577.7
- 2017 **Davis, J.L.** *Structuring a Class Period: Reaching Different Learning Styles in the Classroom*, University of Southern Indiana – Celebration of Teaching and Learning Symposium, Evansville, IN.
- 2016 Cost, I.N., Spates, A., Sellers, K.C., **Davis, J.L.**, Middleton, K.M., Witmer, L.M. and Holliday, C.M. *Relative kinetic competency in the palatal complexes of birds and other diapsids*. Program & Abstracts of the 11th International Congress of Vertebrate Morphology, Washington, D.C. Anatomical Record, Volume 299, Special Feature: 208–209.
- 2016 Cost, I.N., Sellers, K.C., **Davis, J.L.**, Middleton, K.M., Witmer, L.M., & Holliday, C.M. *Postural changes and kinetic competency in the palates of birds and other diapsids*. 76th Annual Meeting of the Society of Vertebrate Paleontology, Salt Lake City, UT. Journal of Vertebrate Paleontology Supplement – Meeting Program and Abstracts: 120–121.
- 2016 Craig, R. ♡, **Davis, J.L.**, Wong, C., Curthoys, I.S., Grant, J.W. *FEA Model for High Frequency Stimulus of Utricle Receptors*, Association for Research in Otolaryngology Midwinter Meeting, San Diego, CA.
- 2016 Ninad, N. ♡, **Davis, J.L.**, Field, B.S. & McCloud, E.S. *Contributions of wing condition and wing veins to flexural stiffness in three species of Lycaenid butterflies*, Annual Meeting of the Society for Integrative and Comparative Biology, Portland, OR.
- 2015 **Davis, J.L.**, McCloud, E.S. & Field, B.S. *Non-uniform Material Properties observed in Lycaenidae Wing Veins*, Annual Meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.
- 2015 Sellers, K.C., **Davis, J.L.**, Middleton, K.M. & Holliday, C.M., *Ontogeny and Biomechanics of the American Alligator Skull*, Society of Vertebrate Paleontology, Dallas, TX.
- 2015 Cost, I.N., Spates, A., Sellers, K.C., **Davis, J.L.**, Middleton, K.M. Witmer, L.M. & Holliday, C.M., *Biomechanics of the Avian Feeding Apparatus*, Society of Vertebrate Paleontology, Dallas, TX.
- 2015 **Davis, J.L.**, McCloud, E.S. & Field, B.S. *Non-uniform Material Properties observed in Lycaenidae Wing Veins*, Annual Meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.
- 2015 Holliday, C.M., Sellers, K.C., Vickaryous, M. K., Ross C.F., Porro, L. B., Witmer, L. M., and **Davis, J.L.** The functional and evolutionary significance of the crocodyliform pterygomandibular joint. Annual Meeting of the Society of Integrative and Comparative Biology, West Palm Beach, FL.
- 2015 Sellers, K.C., **Davis, J.L.**, Mongalo, M., Jacoby, M.J. & Holliday, C.M. *Estimates of Three-Dimensional Cranial Joint Forces in the American Alligator*, Annual Meeting of the Society for Integrative and Comparative Biology, West Palm Beach, FL.
- 2014 Ninad, N. ♡, Field, B.S., McCloud, E.S. & **Davis, J.L.** *Stiffness Components of Wings in Three Species of Lycaenid Butterflies*, American Society of Mechanical Engineers, Montreal, Canada.
- 2014 Holliday, C.M., Sellers, K.C., **Davis, J.L.**, Middleton, K.M., Witmer, L.M. *Modeling Cranial Biomechanics in Archosaurus Using 3D Computational Methods*, Society of Vertebrate Paleontology, Berlin, Germany.

- 2014 Holliday, C.M., Sellers, K.C., **Davis, J.L.**, Tea, J. C. ,Miller-Phillips, C. & Witmer, L. M. *Modeling cranial biomechanics in archosaurs using 3D computational methods*. 126th Annual Meeting of the American Association of Anatomists, Experimental Biology Conference, San Diego, CA.
- 2014 Holliday, C.M., Tea, J.C., Sellers, K.C., Witmer, L.M., & **Davis, J.L.** *Estimating bite force in fossil vertebrate using 3D computational methods*, Annual Meeting of the Society for Integrative and Comparative Biology, Austin, TX.
- 2014 Sellers, K.C., Miller-Phillips, C.M., Schmiegelow, A.B., **Davis, J.L.** & Holliday, C.M. *A Three Dimensional model of bite force in alligator Mississippiensis*, Annual Meeting of the Society for Integrative and Comparative Biology, Austin, TX.
- 2013 Volz, L.J.[♡], Taylor, E.M.[♡], Simpson, K.B.[♡], Field, B.S., McCloud, E.S., & **Davis, J.L.** *Flexural Stiffness & False Head Behavior in Lycaenidae Hind Wings*, Annual Meeting of the Society for Integrative and Comparative Biology, San Francisco, CA.
- 2012 Volz, L.J.[♡], Tepool, E.S.[♡], McCloud, E.S., Field, B.S., **Davis, J.L.**, *False head behavior and mechanics of a temperate butterfly: Experiment and modeling*, ASME Student Professional Development Conference, University of Missouri, Columbia, MO.
- 2009 Rivera, A., **Davis, J.L.**, Grant, J.W., Blob, R.W., Peterson, E.H., Neimann, A.B., Rowe, M.H. *Characterizing utricular stimulation during natural behaviors of the turtle, Trachemys Scripta*. Association for the Research in Otolaryngology, Baltimore, MD.
- 2007 **Davis, J.L.** & Grant, J.W. *Contribution of Hair Bundles to Shear Stiffness of the Column Filament Layer in the Turtle Utricle*. Association of Research in Otolaryngology, Denver, CO.
- 2006 **Davis, J.L.** & Grant, J.W. *Computational Modeling of the Turtle Utricle*. Virginia Academy of Science, Virginia Tech, Blacksburg, VA.
- 2004 **Davis, J.L.** & Grant, J.W. *Effects of Otoconia Thickness and Overall Curvature on Utricular Otolith Dynamics*. Association of Research in Otolaryngology, Daytona, FL; Virginia Tech–Wake Forest Student Symposium, Wake Forest, NC.

Invited Seminars & Workshops

- 2024-July-12 **Davis, J.L.** *Hearing in the Plainfin Midshipman: Finite Element Modeling of the Swim Bladder & Preliminary Analysis Of Hearing Organ Directional Sensitivity*, Los Alamos National Labs Dynamics Summer School, Los Alamos, NM
- 2023-May-04 **Davis, J.L.** *Mechanical Analysis of the Plainfin Midshipman Swim Bladder: An investigation into the swim bladder's role in hearing.*, Seminars in Hearing and Communications Sciences (SHACS) at University of Washington, Seattle, WA (In-Person & Online)
- 2021-Mar-24 **Davis, J.L.** *Bite Force Modeling: From 2D levers to FEA*, Mandible Meeting (Callum Ross) at University of Chicago, Chicago, IL (Online)
- 2018-Jul-18 **Davis, J.L.** *Finite Element Modeling of Inner Ear Organs*, Science with a Twist (Mitch Lumen) at the Bokeh Lounge, Evansville, IN
- Summers
2009–2011 **Davis, J.L. (Instructor)** *Applying Boneload in Biomechanical Finite Element Analyses.*, Finite Element Analysis in Biology Workshop at UMass, Amherst, MA. (I taught participants how to use my Boneload program to apply muscle forces to finite element models of biological structures in this 6 day summer workshop.)

- 2008 | **Davis, J.L.** *A Computational Study into the Effect of Structure and Orientation of the Red Ear Slider Turtle Utricle on Hair Bundle Stimulus.* New Mexico State University, Las Cruces, NM. & Washington State University – Institute for Shock Physics, Pullman, WA.

Research Projects

(My role indicated in parenthesis)

- 2022-2023 | Virginia Merrill Bloedel Traveling Scientist (PI) *An investigation of the ontogeny of midshipman fish swim bladder and correlation to frequency response of otolith organs and swim bladder*, University of Washington, Seattle, WA. (in support of sabbatical)
(\$24k)
- 2022-2023 | Faculty Research and Creative Work Grant (PI) *Effects of swim bladder location and ontogeny on mechanical stimulus and neural response of otolith organs in the midshipman fish*, University of Southern Indiana, Evansville, IN. (in support of sabbatical)
(\$5k)
- 2015-2018 | NSF (Co-PI) *Dinosaur Jaw Muscle Evolution and the Origins of Avian Cranial Evolution*, University of Southern Indiana, Evansville, IN.
(~\$51k)
- 2011-2013 | USI-Internal (Co-PI) *Functional Morphology & Biomechanics of Temperate Lycaenidae Butterflies*, University of Southern Indiana, Evansville, IN.
(~\$2k)

Awards & Honors

- 2024 | **Distinguished Visiting Engineer** for Los Alamos Dynamics Summer School (also noted in Experience above)
(\$45k)
- 2022-2023 | **Virginia Merrill Bloedel Traveling Scientist Award** (also noted in Research Projects above)
(\$24k)
- 2022-2023 | **Faculty Research Creative Works Award** (also noted in Research Projects above)
(\$5k)
- 2022 | **USI Scholarship of Teaching and Learning (SoTL) Fellow**
(\$1k)
- 2017 | **Marching Virginians Alumni Service Award**
(\$1k)
- 2017 | **Pott College Excellence in Scholarship Award**
(\$1k)
- 2012 | **Excellence in Civil Engineering Education (ExCEED) Fellowship**
(\$2.1k)
- 2010 | **Science and Engineering Research Grant Award** Functional Morphology of Butterfly Wings Associated with False-Head Behavior
(\$2k)
- 2004 | **Pratt Fellowship** Engineering Science and Mechanics Academic Fellowship
(\$2k)
- 2002 | **James R. Sochinski Spirit of Tech Award** (Inaugural Recipient) Given to a marching band member who exemplifies the true “Spirit of Tech” by demonstrating outstanding citizenship and dedication during their career as a member of The Marching Virginians.
(\$1k)
- 2002 | **Director’s Award** Given to a member of the Marching Virginians in recognition of extraordinary service to the Virginia Tech marching band.
- 1999 | **James H. Sword Award** – Best Computational Engineering Science and Mechanics (Virginia Tech) Senior Design Project

Academic Service

Professional

2014–Present	American Society for Engineering Education Mechanics Division (2015–Present) <ul style="list-style-type: none"> • Division Chair (2021–2022) • Program Chair (2020–2021) • Program Chair Elect (2019–2020) • Board of Directors (2016–2019) Computers in Education Division <ul style="list-style-type: none"> • Board of Directors (2022–Present)
2023, 2024	Faculty Mentor for teachers interested in learning about Evidence Based Instructional Practices (NSF Improving Undergraduate STEM Education Grant awarded to Oregon State University)
2017	Subject Matter Expert for online homework software development for Pearson Education
2013–2016, 2021	American Society of Civil Engineers ExCEED Teaching Workshop - Assistant Mentor

University

2019–2022	University Promotions Committee - Member
2018–2021	University Curriculum Committee - Member
2016	Pott College Dean Search - Member
2014–2017	Pott College Strategic Plan Outcome II - Excellence In Learning (Chair)
2013–2015	Pott Foundation Faculty Development Award Committee - Member
2012–2019	Program Outcome Assessment Committees - A(Chair), E, G & I
2012–2019	Society of Automotive Engineers (SAE) Faculty Advisor
2011–2015	Fundamentals of Engineering Exam Preparation Short review course for engineering students preparing for the Fundamentals of Engineering Exam

Mentorship

Senior Design

2024	Bissey, J., Cooper, S., Lashley, T. Moore, M. and Tipson, C. – <i>Design and Fabrication of a Miniature Turbojet Engine and Test Bench</i>
2024	Ofjord, A. – <i>Design of a Lava Rock Crushing System</i>
2024	Schultheis, E., Kinsey, D., and Ortega, J. – <i>A High-Altitude Balloon Camera Stabilization System to Capture the Shadow of the Moon Cast on the Earth during 2024 Solar Eclipse</i>
2024	Theobald, C., McCorkle, R., and Mendez, C. – <i>Design of a Remote Controlled Aircraft for the SAE Aero Design Competition</i>
2023	Hartz, B., Pierre, J., Sandoval, A. and Weeks, C. – <i>Design of an Off-Road Manual Wheelchair</i>
2022	Knackmuhs, J.S., Mayer, L.J., Rouch, G.A. and Whitehead, I.T. – <i>3D Printed Fixed-Wing Aircraft for UTA Competition</i>
2022	Harris, R. – <i>Design of a Bow Testing Mechanism</i>
2021	Hagan, T.J. – <i>Analysis of Wheel and Tire Drum Testing Surfaces</i>
2021	Boyce, D.A., Jones, M.B., Ledford, Z.R., Myers, P.J., – <i>Design and Construction of an Appointment Scheduler Appliance for Educational Institutions</i>
2020	Ubelhor, H.M. – <i>Automated Throwline Cannon</i>

- 2020 Hess, J., Jeffries, J.C., Marchand, E.B. & Murdock, D. – *Design and Implementation of a Consumer Automatic Pill Splitter*
- 2020 Deaton, T.J., Dhahir, S., Harker L.W., & Sullivan, G.S. – *Ultralight Aircraft Parachute Deployment System*
- 2019 Courtright, J.R. & Hawkins, M. – *Lifted Assist Mobile Commode Senior Design Report*
- 2019 Kaphle, S. – *Finite Element Model for Welded Butt Joint – An Experimental Approach*
- 2018 Knecht, K.N. – *Pancreatic Enzyme Replacement Therapy Device (PERT-D)*
- 2017 Faith, N.T. – *Automated Barbell Cleaner*
- 2017 Terrell, J., & Woodard, S. – *Accuride Roll Housing Shaft Design*
- 2017 Tuma, S. – *LED Refrigeration Shelf*
- 2017 White, C.S. – *Society of Automotive Engineers Baja Vehicle Steering Design*
- 2016 Barger, C.D., Harkness, D.B. & Sudduth, J.M. – *Fixture Design for High Impact Shock Test of a Hellfire Missile*
- 2015 Brooks, V.I., Calvert, A.R. & Vrzina, D.D. – *2016 Society of Automotive Engineers Baja Car Frame Design*
- 2015 Eckert, D.E. & Roberts, C.A. – *Regrinder/Runner Reclaim Project*
- 2015 Mathis, W.N. & Webster, B.J. – *Elbow Joint Simulation Model for Occupational Therapy Range of Motion Assessment*
- 2015 Rhodes, J.M., Hayes, T.S. & Williams, A.M. – *Designing a High Altitude Radio Controlled Glider*
- 2014 Borman, L.A., Reed, C.E. & Miller, T. – *Wood Shaving Spreader*
- 2013 Elpers, P.J. & Rynkiewich, F.P. – *Society of Automotive Engineers Baja Car Planetary Transmission Design*
- 2013 Elpers, J.L. & Sitzman, D.J. – *Society of Automotive Engineers Baja Car Suspension System Design*
- 2013 Atkinson, J.M. – *The Characterization of Rotary Forging Using DEFORM 3DTM*
- 2012 Arnold D.C. & Wilhite, K.B. – *Design of Society of Automotive Engineers Baja Car Frame*
- 2012 Harms, M.E. – *Design of Hoyer Lift Retrofit kit for Improved Maneuverability*
- 2011 Sparrow, M.K. – *Laptop Garage Linkage Design*
- 2010 Smith, C.C. – *High Altitude Balloon Payload Release Mechanism*

Undergraduate Research

- 2023 Endeavor! Faculty Sponsor to Berger, E.K. – *Impulse Response of Female Midshipman Swim Bladder*
- 2022 Endeavor! Faculty Sponsor to Knackmuhs, J.S., Mayer, L.J., Rouch, G.A. and Whitehead, I.T. – *3D Printed Fixed-Wing Aircraft for UTA Competition*
- 2015 Endeavor! Faculty Sponsor to Vrzina, D.D., Brooks, V.I., Calvert, A.R., Elpers, R.M., Hogan, C.J., McClary, H.R., Ditch, T.W., Fuhs, J.R., Johnson, N., and Johnson, M.S. – *Redesign, Fabricating, and Testing of a Baja Society of Automotive Engineers Vehicle*
- 2014 Endeavor! Faculty Sponsor to Williams, A.M., Rhodes, J.M., and Hayes, T.S. – *Design of a High Altitude Radio Controlled Glider*
- 2013 Endeavor! Faculty Sponsor to Bradshaw, E.A., Wilhite, K.B., Elpers, P.J., Rynkiewich, F.P., Sitzman, D.J. – *Baja Society of Automotive Engineers (Drive Train)*
- 2012-2013 Early Undergraduate Research Mentor to Simpson, K.B. – *Finite Element Modeling of Lycaenide Butterfly Wings*
- 2011-2012 Early Undergraduate Research Mentor & Endeavor! Faculty Sponsor to Volz, L.J. – *Flexural Stiffness of Lycaenide Wings - Experiment & Finite Element Modeling*
- 2006 Davis, A. – *Quantifying Orientation of Turtle Utricle Otoconial Layers*

Outreach

2016–2022	Evansville Museum of Arts, History & Science Science Committee Member
2015 & 2018	Science with a twist (Speaker) An informal public research discussion sponsored by the Evansville Museum of Arts, History & Science.
2013	Evansville Museum of Arts, History & Science Skulls and Bones Exhibit
2011-2013	Tri State Science & Engineering Fair (Judge) is a regional science fair for 4th through 12th grade students.
2011-2014	SeaPerch (Judge) A competition for high school and middle school students to build and run an underwater remote operated vehicle with regional competitions hosted at USI.
2011	URS Consulting This consulting project consisted of providing URS finite element analysis of three potential solutions to a materials problem they faced with one of their products.
2009–Present	James R. Sochinski Award - Donor & Voting Member