# Matthew W. Priddy

*Associate Professor and Additive Manufacturing Lead*
Mississippi State University

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## Education

**Ph.D. in Mechanical Engineering** | *Georgia Institute of Technology* **2016**
Advisor: Dr. David L. McDowell
Dissertation Title: *Exploration of forward and inverse protocols for property optimization of Ti-6Al-4V*

**M.S. in Civil Engineering** | *Mississippi State University* **2010**
Advisor: Dr. Philip M. Gullett
Thesis Title: *A study of grain rotations and void nucleation in aluminum triple junctions using MD and CPFEM*

**B.S. in Civil Engineering** | *Mississippi State University* **2008**
Summa Cum Laude, Minor in Mathematics

## Professional Experience

**Associate Professor** ◆ Michael W. Hall School of Mechanical Engineering **2023 – Present**
Mississippi State University | Starkville, MS

**Additive Manufacturing Lead** ◆ Center for Advanced Vehicular Systems (CAVS) **2024 – Present**
Mississippi State University | Starkville, MS

**Assistant Professor** ◆ Department of Mechanical Engineering **2017 – 2023**
Mississippi State University | Starkville, MS

**Visiting Assistant Professor** ◆ Department of Mechanical Engineering **2016 – 2017**
Mississippi State University | Starkville, MS

## Research Thrusts

**Additive Manufacturing** *Experimental, Modeling & Simulation, and Data Management*

- Thermo-mechanical modeling of AM technologies for process-structure-property (PSP) predictions
- In-situ monitoring of AM processes for feedback control, defect detection, and print qualification
- Merging of experimental datasets and simulation predictions for real-time decision making and quality assurance

**Computational Solid Mechanics** *Finite Element Based Mesoscale and Macroscale Length Scales*

- Extension of current FE material models of metallic, cementitious, and composite materials for extreme conditions
- Crystal plasticity finite element method (CPFEM) for examination of microstructure-sensitive deformation response
- Process-structure-property predictions for multi-physics applications

**Biomedical Implants** *Surgical and In-Service Use Conditions*

- Device development and sensor integration for measuring mechanical loading during simulated medical procedures
- Experiments and simulation of chemo-mechanical corrosion of biodegradable implants

## Summary and Statistics

- 44 Manuscripts Published
- 8 Manuscripts Under Review
- 115 Presentations Authored
- 5 Technical Reports Authored
- Graduates: 4 Ph.D., 11 M.S. (thesis), 11 M.S. (non-thesis)
- Current: 8 Ph.D., 8 M.S. (thesis), 2 M.S. (non-thesis)
- Mentored 83 research-related undergraduates
- 41 Grants Awarded (29 External and 12 Internal)
- $7,041,240 PI Funding
- $6,774,046 Co-PI Funding
- $16,433,586 Funding Awarded (including collaborators)
- 216 letters of recommendation (80 students)
- 855 Student Taught (19 Courses) + 73 DIS Courses

## Publications Under Review (Underline indicates mentee of MWP)

8. Abhijith Madabhushi, Charles U. Pittman Jr., Thomas E. Lacy Jr., Santanu Kundu, & **Matthew W. Priddy**. "A char removal protocol to visualize fiber cross-sections of carbon/epoxy composites subjected to flame." *SUBMITTED to Polymer Composites*

7. Shahryar Mooraj, Shuai Feng, Matthew Luebbe, Matthew Register, Jian Liu, Tianyi Li, Baris Yavas, David P. Schmidt, **Matthew W. Priddy**, Michael B. Nicholas, Victor K. Champagne, Mark Aindow, Haiming Wen, & Wen Chen. "Martensitic transformation induced strength-ductility synergy in additively manufactured maraging 250 steel by thermal history engineering." *ACCEPTED to International Journal of Machine Tools and Manufacture*.

6. Reese Dunne, Dickel E. Doyl, Addison M. Green, Dam Kim, Lauren B. Priddy, & **Matthew W. Priddy**. "Finite element and density functional theory modeling effectively predict pitting degradation of hydroxyapatite-coated pure magnesium." *SUBMITTED to Journal of Biomedical Materials Research Part B: Applied Biomaterials*.

5. Clark Hensley, J. Logan Betts, CJ Nguyen, & **Matthew W. Priddy**. "ODBPlotter: Modern Data Processing and Visualization Tool for Additive Manufacturing Thermal Models in Abaqus." *ACCEPTED to Software Impacts*.

4. Laura H. J. Alberto, Jason A. Griggs, Michael Roach, Randal Williamson, Ravi Chandram, **Matthew W. Priddy**, Yue F. Lu, Patrick Bergin, Yuanyuan Duan. "Biomechanical Analysis of Zygomatic Implants with Clinically Relevant Configurations: A Finite Element Study Based on ISO 14801." *SUBMITTED to Journal of the Mechanical Behavior of Biomedical Materials*.

3. Alexis Graham, Charlotte Thompson, Darrock Flynn, Honor Elchos, Jaydon Gibson, Lauren B. Priddy, & **Matthew W. Priddy**. "Design and Construction of a Low-Cost Compressive Loading and Perfusion Flow Bioreactor." *R&R to HardwareX*.

2. Luke Peterson, David Failla, **Matthew W. Priddy**, & Jesse Sherburn. "Evaluation of Two Constitutive Modeling Approaches for Finite Element Simulation of Ballistic Impact of Varying Thickness Monolithic Aluminum Plates by Steel Spheres." *R&R to International Journal of Impact Engineering*.

1. Andrea K. Persons, Youssef Hammi, Steven H. Elder, Lauren B. Priddy, **Matthew W. Priddy**, J. Ryan Butler, Avery J. Schemmel, Elizabeth N. Whitehurst, NaYeon Lee, & Mark F. Horstemeyer. "Theoretical Model of Impact Mitigation Mechanisms Inherent to the North American Bison Skull." *SUBMITTED to Journal of Experimental Biology*

## Peer-Reviewed Publications (Underline indicates mentee of MWP)

44. Christian Zamiela, Ryan Stokes, Wenmeng Tian, Haley Doude, **Matthew W. Priddy**, & Linkan Bian (2024). "Physics-Informed Approximation of Internal Thermal History for Surface Deformation Predictions in Wire Arc Directed Energy Deposition." *ASME Journal of Manufacturing Science and Engineering*, 146(8): 081007. doi.org/10.1115/1.4065416.

43. J. Logan Betts, Bradley J. Sampson, Kyle Lindsey, Frank M. Brinkley, & **Matthew W. Priddy** (2024). "Reduction of Process Induced Porosity for Ultrafuse 316L through Parameter Optimization of Creality Ender 3 V2 and Makerbot Method X." *Crystals*, 14(3), 285. doi.org/10.3390/cryst14030285.

42. Matthew Dantin & **Matthew W. Priddy** (2024). "A Rate- and Temperature-Dependent Thermomechanical Internal State Variable Model of the Directed Energy Deposition Process." *Journal of Materials Engineering and Performance (JMEP)*. doi.org/10.1007/s11665-024-09164-5.

41. Matthew A. Register, J. Logan Betts, & **Matthew W. Priddy** (2023). "Finite Element Modeling Approach to Dwell Time Optimized Maraging 250 Parts for Wire Arc Directed Energy Deposition." ASME 2023 International Mechanical Engineering Congress and Exposition Conference Proceedings, New Orleans, LA, October 29-November 2, 2023. doi.org/10.1115/IMECE2023-111920.

40. Patrick S. Camacho, J. Logan Betts, & **Matthew W. Priddy** (2023). "Development of Representative Volume Element for Electromagnetic Characterization of a Heterogeneous Geomaterial." ASME 2023 International Mechanical Engineering Congress and Exposition Conference Proceedings, New Orleans, LA, October 29-November 2, 2023. doi.org/10.1115/IMECE2023-111758.

39. Haley Petersen, Bradley Sampson, David Failla Jr., **Matthew W. Priddy**, & Zack McClelland (2023). "The Variation of Mechanical Properties of M300 Maraging Steel Manufactured with Varying Process Parameters in Laser Powder Bed Fusion." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023. doi.org/10.26153/tsw/50977.

38. Alexis Graham, Caitlin Luke, Frank Brinkley, Jaden Bennett, Cody Gressett, Micah Foster, Zach Hooper, Jerald Redmond, Daniel Woods, MeLeah A. Henson, Rex Armstrong, Lauren B. Priddy, & **Matthew W. Priddy** (2023). "Benchtop impaction device replicates cadaveric loading conditions of the transforaminal lumbar interbody fusion (TLIF) procedure." *Biomedical Engineering Advances*. 6, 100105. doi.org/10.1016/j.bea.2023.100105.

37. J. Logan Betts, Frank M. Brinkley, Lauren B. Priddy, & **Matthew W. Priddy** (2023). "Low-Speed Instrumented Drill Press for Bone Screw Insertion." *HardwareX*. 16, e00474. doi.org/10.1016/j.ohx.2023.e00474.

36. MohammadBagher Mahtabi, Aref Yadollahi, Ryan M. Stokes, Haley Doude, & **Matthew W. Priddy** (2023). "Effects of build interruption during laser powder bed fusion process on structural integrity of Ti-6Al-4V." *Engineering Failure Analysis*. 153, 107626. doi.org/10.1016/j.engfailanal.2023.107626.

35. Naoufal Harich, **Matthew W. Priddy**, Thomas E. Lacy Jr., Charles U. Pittman Jr., & Santanu Kundu (2023). "Effects of cyclic absorption–desorption of model fuels by aerospace-grade carbon/epoxy composites." *Polymer Composites*. 1-11. doi.org/10.1002/pc.27468.

34. Elizabeth N. Whitehurst, Nathaniel A. Hyams, Morgan Green, & **Matthew W. Priddy** (2023). "An assessment of the effectiveness of group work in a mechanical engineering program." *Proceedings of 2023 ASEE Southeastern Section Annual Conference and Meeting. Fairfax, VA*ASEE-SE Proceedings Repository.

33. Dounia Boushab, Hasnaa Ouidadi, Aniket Mote, **Matthew Priddy**, Santanu Kundu, Charles Pittman Jr., Jaime Grunlan, Qingsheng Wang, & Thomas Lacy Jr. (2023) "Fire impact on mechanically failed graphite/epoxy composites." *Polymer Composites*. 44(4), 2236-2249. doi.org/10.1002/pc.27239.

32. Ryan M. Stokes, Aref Yadollahi, **Matthew W. Priddy**, Linkan Bian, Vince Hammond, & Haley Doude (2023). "Effects of Build Interruption and Restart Procedure on Microstructure and Mechanical Properties of Laser Powder Bed Fusion Al-Si-10Mg." *Journal of Materials Engineering and Performance*. 32 (4), 1576-1588. doi.org/10.1007/s11665-022-07217-1.

31. Bradley Sampson, Courtney Morgan-Barnes, Ryan Stokes, Haley Doude, & **Matthew W. Priddy** (2022). "Investigating the Relationship Between In-Process Quality Metrics and Mechanical Response in the L-PBF Process." *Proceedings of the 2022 International Solid Freeform Fabrication (SFF) Symposium*. dx.doi.org/10.26153/tsw/44209.

30. Matthew Register & **Matthew W. Priddy** (2022). "Effects Due to Variations in Thermal Properties of Maraging Steel for Finite Element Modeling of the WAAM Process." *Proceedings of the 2022 International Solid Freeform Fabrication (SFF) Symposium*. dx.doi.org/10.26153/tsw/44228.

29. J. Logan Betts, Will Downs, Matthew J. Dantin, & **Matthew W. Priddy** (2022). "Examining the GPU Acceleration Speed-up for Finite Element Modeling of Additive Manufacturing." *Proceedings of the 2022 International Solid Freeform Fabrication (SFF) Symposium*. dx.doi.org/10.26153/tsw/44316.

28. Matthew J. Dantin, William M. Furr, & **Matthew W. Priddy** (2022). "Towards a physical basis for a predictive finite element thermal model of the LENS process leveraging dual-wavelength pyrometer datasets." *Integrating Materials and Manufacturing Innovation (IMMI)*. 11(3), 407-417. doi.org/10.1007/s40192-022-00271-6.

27. Naoufal Harich, Rania Bassou, **Matthew W. Priddy**, Thomas E. Lacy Jr., Charles U. Pittman Jr., & Santanu Kundu (2022). "Effects of alternative jet fuel blends on aerospace-grade carbon/epoxy composites." *Materials and Design*. 221, 110993. doi.org/10.1016/j.matdes.2022.110993.

26. Megha Satpathy, Yuanyan Duan, J. Logan Betts, **Matthew W. Priddy**, and Jason Griggs (2022). "Effect of Bone Remodeling on Dental Implant Fatigue Limit Predicted Using 3D Finite Element Analysis," *Journal of Dentistry and Oral Epidemiology*. 2(1). doi.org/10.54289/JDOE2200102.

25. Anna S. Rourke, Mary Catherine Beard, Sophie E. Jones, **Matthew W. Priddy**, & Lauren B. Priddy (2022). "Hydroxyapatite coating promotes stable physicochemical properties of pure magnesium in a longitudinal degradation study." *Journal of Materials Research*. 37, 1231-1245. doi.org/10.1557/s43578-022-00523-3.

24. Mojtaba Khanzadeh, Matthew Dantin, Wenmeng Tian, **Matthew W. Priddy**, Haley Doude, & Linkan Bian (2022). "Fast Prediction of Thermal Data Stream for Direct Laser Deposition Processes Using Network-Based Tensor Regression." *Journal of Manufacturing Science and Engineering*. 144(4), 041004. doi.org/10.1115/1.4052207.

23. Aniket Mote, Hasnaa Ouidadi, Dounia Boushab, **Matthew W. Priddy**, Santanu Kundu, Charles Pittman Jr., Jaime Grunlan, Qingsheng Wang, & Thomas E. Lacy Jr. (2021). "Post mechanical failure fire damage characterization of graphite/epoxy composites." *Proceedings of the American Society for Composites Thirty-Sixth Technical Conference on Composite Materials*. doi.org/10.12783/asc36/35890.

22. YubRaj Paudel, Deepesh Giri, **Matthew W. Priddy**, Christopher D. Barrett, Kaan Inal, Mark A .Tschopp, Hongjoo Rhee, & Haitham El Kadiri (2021). "A review on capturing twin nucleation in crystal plasticity for hexagonal metals." *Metals*. 11(9), 1373. doi.org/10.3390/met11091373.

21. Nanqiao Wang, David Korba, Zixiang Liu, Raj Prabhu, **Matthew W. Priddy**, Shengfeng Yang, Lei Chen, & Like Li (2021). "Phase-Field-Lattice Boltzmann Model for Dendritic Growth with Melt Flow and Thermosolutal Convection-Diffusion." *Computer Methods in Applied Mechanics and Engineering*. 385, 114026. doi.org/10.1016/j.cma.2021.114026.

20. Brett D. Ellis, Hasan Haider, **Matthew W. Priddy**, & Anirban Patra (2021). "Integrated computational design of three phase Mo-Si-B alloy turbine blade for high temperature aerospace applications." *Integrating Materials and Manufacturing Innovation*. 10, 245-264. doi.org/10.1007/s40192-021-00207-6.

19. Weitong Chen, Luke Nichols, Frank Brinkley, Kelson Bohna, Wenmeng Tian, **Matthew W. Priddy**, & Lauren B. Priddy (2021). "Alkali treatment facilitates functional nano-hydroxyapatite coating of 3D printed polylactic acid scaffolds." *Materials Science and Engineering: C*. 120, 111686. doi.org/10.1016/j.msec.2020.111686.

18. Bohumir Jelinek, W. Joseph Young, Matthew J. Dantin, William M. Furr, Haley Doude, & **Matthew W. Priddy** (2020). "Two-dimensional thermal finite element model of directed energy deposition: Matching melt pool temperature profile with pyrometer measurement." *Journal of Manufacturing Processes*. 57, 187-195. doi.org/10.1016/j.jmapro.2020.06.021.

17. YubRaj Paudel, Joeseph Indeck, Kavan Hazeli, **Matthew W. Priddy**, Kaan Inal, Hongjoo Rhee, Christopher D. Barrett, Wilburn R. Whittington, Krista R. Limmer, & Haitham El Kadiri (2020). "Characterization and modeling of $\{10\bar{1}2\}$ twin banding in magnesium." *Acta Materialia*. 183, 438-451. doi.org/10.1016/j.actamat.2019.11.020.

16. Thomas E. Allard, **Matthew W. Priddy**, Isaac L. Howard, & Jay Shannon (2020). "Isothermal strength development models of ultra-high-performance concrete." *ACI Materials Journal*. 117, 1-11. doi.org/10.14359/51719075.

15. Jacob Easley, Joseph Young, **Matthew W. Priddy**, and Haley Doude. "Additive manufacturing of propellant tank and structural supports of CubeSat cold gas propulsion system." AIAA Propulsion and Energy 2019 Forum. AIAA 2019-4309. doi.org/10.2514/6.2019-4309.

14. Emily Spayde, Alta Knizley, & **Matthew W. Priddy** (2019). "Development and implementation of a study tool for cumulative problem solving in thermodynamics." *Proceedings of 2019 ASEE Southeastern Section Annual Conference and Meeting. Raleigh, NC*. ASEE-SE Proceedings Repository.

13. Kyle A. Brindley, **Matthew W. Priddy**, & Richard W. Neu (2019). "Integrative materials design of three-phase Mo-Si-B alloys." *Integrating Materials and Manufacturing Innovation*. 8, 1-16. doi.org/10.1007/s40192-019-0124-4.

12. Jeffery T. Lloyd, Andrew J. Matejunas, Richard Becker, Timothy R. Walter, **Matthew W. Priddy**, & Jamie Kimberley (2019). "Dynamic tensile failure of rolled magnesium: Simulations and experiments quantifying the role of texture and second-phase precipitates." *International Journal of Plasticity*. 114, 174-195. doi.org/10.1016/j.ijplas.2018.11.002.

11. Noah H. Paulson, **Matthew W. Priddy**, David L. McDowell, & Surya R. Kalidindi (2019). "Reduced-order microstructure-sensitive protocols to rank-order the transition fatigue resistance of polycrystalline microstructures." *International Journal of Fatigue*. 119, 1-10. doi.org/10.1016/j.ijfatigue.2018.09.011.

10. Matthew J. Dantin, William M. Furr, & **Matthew W. Priddy** (2018). "Towards an open-source, preprocessing framework for simulating material deposition for a directed energy deposition process." *Proceedings of the 29th Annual International Solid Freeform Fabrication (SFF) Symposium*. dx.doi.org/10.26153/tsw/17192.

9. Noah H. Paulson, **Matthew W. Priddy**, David L. McDowell, & Surya R. Kalidindi (2018). "Data-driven reduced-order models for rank-ordering the high cycle fatigue performance of polycrystalline microstructures." *Materials and Design*. 154, 170-183. doi.org/10.1016/j.matdes.2018.05.009.

8. Paul C. Kern, **Matthew W. Priddy**, Brett D. Ellis, & David L. McDowell (2017). "pyDEM: A generalized implementation of the inductive design exploration method." *Materials and Design*. 134, 293-300. doi.org/10.1016/j.matdes.2017.08.042.

7. **Matthew W. Priddy**, Noah H. Paulson, Surya R. Kalidindi, & David L. McDowell (2017). "Strategies for rapid parametric assessment of microstructure-sensitive fatigue for HCP polycrystals." *International Journal of Fatigue*. 104, 231-242. doi.org/10.1016/j.ijfatigue.2017.07.015.

6. Noah H. Paulson, **Matthew W. Priddy**, David L. McDowell, & Surya R. Kalidindi (2017). "Reduced-order structure-property linkages for polycrystalline microstructures based on 2-point statistics." *Acta Materialia*. 129, 428-438. doi.org/10.1016/j.actamat.2017.03.009.

5. Jeffrey T. Lloyd & **Matthew W. Priddy** (2017). "Simulating strain localization in rolled magnesium." *Acta Materialia*. 129, 149-158. doi.org/10.1016/j.actamat.2017.02.043.

4. Jordan S. Weaver, **Matthew W. Priddy**, David L. McDowell, & Surya R. Kalidindi (2016). "On capturing the grain-scale elastic and plastic anisotropy of alpha-Ti with spherical nanoindentation and electron back-scattered diffraction." *Acta Materialia*. 117, 23-34. doi.org/10.1016/j.actamat.2016.06.053.

3. Stephanie Gillespie & **Matthew W. Priddy** (2016). "Graduate students working towards engineering education: A case study of the GT-ASEE student chapter and programming." *Proceedings of 2016 ASEE Southeastern Section Annual Conference and Meeting. Tuscaloosa, AL.* ASEE-SE Proceedings Repository.

2. Anirban Patra, **Matthew W. Priddy**, & David L. McDowell (2015). "Modeling the effects of microstructure on the tensile properties and micro-fracture behavior of Mo-Si-B alloys at elevated temperatures." *Intermetallics*. 64, 6-17. doi.org/10.1016/j.intermet.2015.04.008.

1. Rebecca Reck, Anastasia Rynearson, & **Matthew W. Priddy** (2015). "ASEE student chapter longevity and programming." *American Society for Engineering Education: Proceedings of the 2015 ASEE Annual Conference and Exposition. Seattle, WA.* ASEE Proceedings Repository.

## Funded Grants, Awards, and Contracts

41. **Comprehensive Evaluation of Hydroxyapatite Coatings to Improve Degradation Characteristics of Additively Manufactured Porous Magnesium Implants**
Office of Research and Economic Development (ORED) at MSU — 06/2022 - 05/2024
Co-Principal Investigator with L. Priddy (PI), M. Jaffe, & H. Jahr — $45,000

40. **Phase II: Towards the Prediction and Eeduction of Residual Stresses in Additively Manufactured Ti-6Al-4V**
II-VI Foundation — 07/2022 - 06/2023
Co-Principal Investigator with H. Doude (PI) — $90,080

39. **Phase I: Towards the Prediction and Eeduction of Residual Stresses in Additively Manufactured Ti-6Al-4V**
II-VI Foundation — 07/2021 - 06/2022
Co-Principal Investigator with H. Doude (PI) — $88,547

38. **Phase II: Development & Transition of HY80 Steel for Qualification to NAVSEA WIRE-DED Tech Pub**
NCDMM via America Makes — 04/2024 - 07/2025
Principal Investigator at MSU ($225k); Worcester Polytechnic Institute (Lead) — $750,000

37. **Phase III: Methods for Defect Detection of AM Processes**
American Lightweight Materials Mfg Innovation Inst (ALMMII) — 03/2024 - 05/2025
Principal Investigator — $248,458

36. **Phase II: Methods for Defect Detection of AM Processes**
American Lightweight Materials Mfg Innovation Inst (ALMMII) — 12/2022 - 02/2024
Principal Investigator — $247,667

35. **Phase II STTR: Computationally Driven Reliability & Repeatability for Wire Arc Additive Manufacturing of High Strength Maraging 250 Steel**
DEVCOM-ARL-Army — 07/2023 - 06/2025
Principal Investigator at MSU ($225k); Solvus Global (Lead) — $1,150,000

34. **Phase I: Development & Transition of HY80 Steel for Qualification to NAVSEA WIRE-DED Tech Pub**
NCDMM via America Makes — 04/2023 - 12/2023
Principal Investigator at MSU ($125k); Worcester Polytechnic Institute (Lead) — $300,000

33. **High Throughput Finite Element Modeling for Additive Manufacturing**
Engineering Research & Development Center (ERDC) — 12/2022 - 12/2025
Principal Investigator with T. Stone — $1,257,221

32. **Developing Tools to Investigate Biologically Inspired Adhesives**
NASA via MSSGC Seed Grant — 08/2022 - 08/2023
Principal Investigator at MSU ($4,377); T. Hagey, Mississippi University for Women (Lead) — $14,277

31. **Phase I STTR: Computationally Driven Reliability & Repeatability for Wire Arc Additive Manufacturing of High Strength Maraging 250 Steel**
DEVCOM-ARL-Army 07/2022 - 01/2023
Co-Principal Investigator with H. Doude (PI) at MSU ($60.5k); Solvus Global (Lead) $173,000

30. **Residual Stresses and Bone Remodeling: A Two-Step Simulation Framework for Improved Finite Element Modeling of Dental Implants**
National Institutes of Health (NIH) via MCCTR Pilot Project Program 08/2022 - 08/2023
Principal Investigator $54,000

29. **Loading Conditions of Instruments Used During Spinal Surgeries**
Medtronic plc 08/2020 - 08/2024
Principal Investigator with L. Priddy $167,500

28. **AI/ML-Based Constitutive Models Leveraging Historical Geomaterial Datasets**
Engineering Research & Development Center (ERDC) 05/2021 - 12/2024
Principal Investigator $710,169

27. **Towards the Design of Graded Material Protective Systems with Additive Manufacturing**
Engineering Research & Development Center (ERDC) 05/2021 - 12/2024
Principal Investigator with H. Doude & L. Bian $1,044,643

26. **Phase II STTR: Prediction of Geomaterial Composition via Electromagnetic Response**
Engineering Research & Development Center (ERDC) 04/2022 - 04/2024
Principal Investigator at MSU ($330k); Cornerstone Research Group (Lead) $1,100,000

25. **Phase I STTR: Prediction of Geomaterial Composition via Electromagnetic Response**
Engineering Research & Development Center (ERDC) 03/2021 - 08/2021
Principal Investigator at MSU ($66.6k); Cornerstone Research Group (Lead) $166,500

24. **Anomaly Detection and Sensor Fusion for Thermal Imaging Streams Generated from Laser Based AM**
Engineering Research & Development Center (ERDC) 03/2021 - 02/2024
Co-Principal Investigator with L. Bian (PI) & H. Doude $637,531

23. **Phase II: Effect of New Jet Fuel Exposure & Post-Crash Fire Forensic Analysis of Aerospace Composites**
Federal Aviation Administration (FAA) 12/2020 - 10/2022
Principal Investigator with T. Lacy, S. Kundu, C. Pittman, & D. Smith $500,000

22. **Effect of New Jet Fuel Exposure & Post-Crash Fire Forensic Analysis of Aerospace Composites**
Federal Aviation Administration (FAA) 03/2019 - 02/2020
Principal Investigator with T. Lacy, S. Kundu, C. Pittman, & D. Smith $500,000

21. **Development of a high-temperature FDM 3D printer for PEEK and ULTEM**
Bagley College of Engineering (BCoE) at MSU 08/2024 - 05/2025
Principal Investigator with Evan Garrison (UG Researcher, Co-PI) $2,500

20. **Thermo-mechanical finite element modeling of polymer additive manufacturing**
Office of Research and Economic Development (ORED) at MSU 10/2022 - 09/2024
Principal Investigator with S. Kundu $3,500

19. **Modeling osseointegration: in vitro characterization of osteogenic cell behavior on 3D printed composite polymer-magnesium scaffold**
Office of Research and Economic Development (ORED) at MSU 10/2020 - 09/2022
Co-Principal Investigator with L. Priddy (PI) $4,000

18. **Development and Implementation of a Magnesium-Based Finite Element Degradation Model**
Office of Research and Economic Development (ORED) at MSU 10/2020 - 09/2022
Principal Investigator with L. Priddy $4,000

17. **Computational and Biomechanical Evaluation of OsteoCentric and Conventional Bone-Screw-Fastener**
OsteoCentric Technologies 09/2020 - 05/2021
Principal Investigator with S. Elder, L. Priddy, & M. Jaffe $12,242

16. **Tool Kinetics Simulator**
Milwaukee Tool 08/2020 - 05/2021
Co-Principal Investigator with W. Whittington (PI), H. Rhee, H. El Kadiri, & Y. Hammi $90,000

15. **Development of Data-Driven Process Monitoring Methods for RAD Technologies**
Army Research Laboratory (ARL) 08/2020 - 08/2022
Co-Principal Investigator with L. Bian (PI) & H. Doude $400,311

14. **Towards Thermomechanical FE Model Predictions for WAAM**
Army Research Laboratory (ARL) 08/2020 - 08/2022
Principal Investigator with H. Doude & L. Bian $434,165

13. **Investigation and Identification of Methods to Monitor the WAAM Process for Defect Detection**
National Center for Manufacturing Sciences (NCMS) 03/2020 - 08/2022
Co-Principal Investigator with H. Doude (PI), L. Bian, & WJ Young $730,196

12. **Developing a Thermal-Mechanical FE Model of the WAAM Process**
National Center for Manufacturing Sciences (NCMS) 03/2020 - 08/2022
Principal Investigator with H. Doude & L. Bian $539,792

11. **Machine Learning for the WAAM Process**
National Center for Manufacturing Sciences (NCMS) 03/2020 - 08/2022
Co-Principal Investigator with L. Bian (PI), H. Doude, & D. Dickel $450,626

10. **Towards the Design of Graded Material Protective Systems with AM**
Engineering Research & Development Center (ERDC) 09/2019 - 09/2021
Principal Investigator with H. Doude & L. Bian $324,156

9. **Physical Simulation of High-Volume Metal Deposition of AM for Transportation Infrastructure**
Engineering Research & Development Center (ERDC) 09/2019 - 09/2021
Co-Principal Investigator with H. Doude (PI) & L. Bian $424,267

8. **Development and Analysis of Finite Element Models from Micro-CT Imaging**
Office of Research and Economic Development (ORED) at MSU 10/2018 - 09/2020
Principal Investigator with L. Priddy $4,000

7. **Structural and Biological Characterization of Degradable Orthopedic Implants**
Office of Research and Economic Development (ORED) at MSU 10/2017 - 09/2019
Co-Principal Investigator with L. Priddy (PI) $4,000

6. **Transitioning Material Systems from Laboratory to Fabrication (AM Task)**
Army Research Laboratory (ARL) 08/2015 - 08/2020
Co-Principal Investigator with L. Bian (PI), H. Doude, & W. Tian $3,748,988

5. **Towards Curved Wall Surfaces to Simulate Vertebrae for Benchtop Testing of Spinal Implant Procedures**
Bagley College of Engineering Undergraduate Research Program at MSU 08/2021 - 05/2022
Principal Investigator with Caitlin Luke (UG Researcher, Co-PI) $2,500

4. **Cellular Automata Simulation for Microstructural Estimation during Wire-Arc Additive Manufacturing**
Bagley College of Engineering Undergraduate Research Program at MSU 08/2021 - 05/2022
Principal Investigator with Harrison Williams (UG Researcher, Co-PI) $2,500

3. **Student Perception of Importance of Group Work with Mechanical Engineering Education**
Bagley College of Engineering Undergraduate Research Program at MSU 01/2021 - 05/2021
Principal Investigator with Nate Hyams (UG Researcher, Co-PI) $1,250

2. **Ti-64 Porous Hip Implants to Reduce Stress Shielding**
Bagley College of Engineering Undergraduate Research Program at MSU 08/2019 - 05/2020
Principal Investigator with Caroline Schaade (UG Researcher, Co-PI) $2,500

1. **Finite Element Indentation Simulations of Irradiated Tungsten**
Bagley College of Engineering Undergraduate Research Program at MSU 08/2018 - 05/2019
Principal Investigator with Erin O'Quinn (UG Researcher, Co-PI) $2,500

## Technical Reports (Underline indicates mentee of MWP)

5. Abhijith Madabhushi, Dounia Boushab, Hasnaa Ouidadi, Hajar Righi, Thomas Lacy, Santanu Kundu, Charles Pittman, & **Matthew W. Priddy** (2024). "Post-Small Flame Forensic Analysis of Aerospace Composites." *Sponsor: Federal Aviation Administration (FAA); Report No: DOT/FAA/TC-22/20; Contract No: 12-C-AM-MSU;* Available from National Transportation Library's Repository & Open Science Access Portal.

4. Naoufal Harich, Rania Bassou, Hajar Righi, Abhijith Madabhushi, Hasnaa Ouidadi, Dounia Boushab, Thomas Lacy, Charles Pittman, **Matthew W. Priddy**, & Santanu Kundu (2022). "Effects of New Jet Fuel Exposure on Aerospace Composites – Phase 1 Final Report." *Sponsor: Federal Aviation Administration (FAA); Report No: DOT/FAA/TC-21/53; Contract No: 12-C-AM-MSU;* Available from Federal Aviation Administration William J. Hughes Technical Center.

3. Isaac L. Howard, Thomas Allard, Ashley S. Carey, **Matthew W. Priddy**, Alta A. Knizley, & Jameson D. Shannon (2021). "Development of CORPS-STIF 1.0 with application to ultra-high performance concrete (UHPC)." *Sponsor: Engineer Research and Development Center (ERDC); Report No: ERDC/GSL TR-21-14; Contract No: W56HZV-17-C-0095;* Available from ERDC Knowledge Core.

2. Hajar Righi, Abhijith Madabhushi, Hasnaa Ouidadi, Dounia Boushab, Thomas Lacy, Santanu Kundu, Charles Pittman, & **Matthew W. Priddy** (2020). "Post-Crash Fire Forensic Analysis on Aerospace Composites – Literature Review." *Sponsor: Federal Aviation Administration (FAA); Report No: DOT/FAA/TC-20/21; Contract No: 12-C-AM-MSU;* Available from Federal Aviation Administration William J. Hughes Technical Center.

1. Rania Bassou, Naoufal Harich, Thomas Lacy, Charles Pittman, **Matthew W. Priddy**, & Santanu Kundu (2020). "Effect of Jet Fuels Exposure on Aerospace Composites – Literature Review." *Sponsor: Federal Aviation Administration (FAA); Report No: DOT/FAA/TC-20/22; Contract No: 12-C-AM-MSU;* Available from Federal Aviation Administration William J. Hughes Technical Center.

## Teaching Experience

**Associate Professor** ◆ Mississippi State University **2023 – Present**
Mechanical Metallurgy and Fundamentals of FEA

**Assistant Professor** ◆ Mississippi State University **August 2017 - August 2023**
Mechanical Metallurgy and Fundamentals of FEA

**Visiting Assistant Professor** ◆ Mississippi State University **August 2016 - August 2017**
Taught 3 courses in Fall (Thermo I, Mech. Met., FE in ME) and 2 in Spring (Thermo I; Mech. Sys. Des.)

**Teaching Assistant** ◆ Georgia Institute of Technology **January 2013 - May 2013**
*COE 3001: Deformable Bodies* with 54 undergraduate students

**INSPIRE$^2$ Teaching Workshop** ◆ Georgia Institute of Technology **May 2014 & 2015**
Principal organizer; workshop introduced graduate students to active learning techniques, the learner-centered classroom, best practices for novice instructors, and various new teaching methods

**How to Engineer Engineering Education (E$^3$) Workshop** ◆ Bucknell University **July 24 - 26, 2013**
Led by Dr. Micheal Prince, this workshop provided instruction on topics such as active, cooperative, and problem-based learning; proper assessment techniques; teamwork and problem-solving skills

**Interactive Teaching Workshop** ◆ Georgia Institute of Technology **June 6, 2013**
Assisted in planning this workshop that introduced participants to non-traditional teaching methods and illustrated the effective application of these methods in the classroom

**Teaching, Scholarship and Research Workshop** ◆ Georgia Institute of Technology **May 8, 2012**
Organized to build an engineering education coalition at GT and to discuss current pedagogical research

**Graduate Teaching Assistant** ◆ Mississippi State University **February 2010**
*CE 3601: Stress Analysis Lab* with 30 undergraduate students and Delivered lab demonstration, handout, and report outline for "Uniaxial Tension Testing"

## Graduate Student Alumni and Subsequent Employment (*Co-Major Prof)

**Ryan Stokes** Ph.D. in ME in 2024 Research Engineer at NWSC Carderock
Dissertation: *"An Open Source Digital Twin of the Wire Arc DED Process for Interpass Temperature Control"*

**Naoufal Harich** Ph.D. in ME in 2023 Postdoctoral Associate at MSU
Dissertation: *"Effects of alternative jet fuels on aerospace-grade composites: experimental and modeling studies"*

**Matthew Dantin** Ph.D. in ME in 2021 Research Engineer at NWSC Carderock
Dissertation: *"Thermomechanical modeling predictions of the DED process using a dislocation mechanics based ISV model"*

**Sarajane Hill** Ph.D. in ME in 2021 (Distance) Instructor at Robert Morris University
Dissertation: *"Thermal experimentation of PA6 and PA66 thermoplastic through transmission laser welding"*

**Haley Petersen** M.S. in ME in 2024 Research Engineer at ERDC
Thesis: *"Process Parameter Optimization of M300 Maraging Steel and Mechanical Characterization of M300 Cellular Structures"*

**Alexis Graham** M.S. in ABE in 2023* Process Engineer at Charles River Laboratories
Thesis: *"Design, development, and validation of a perfusion-compression bioreactor to study osteogenesis in bone explants"*

**Brad Sampson** M.S. in ME in 2023 Research Engineer at ORNL
Thesis: *"Mechanical characterization of functionally graded M300 maraging steel cellular structures"*

**Nick Hopkins** M.S. in ME in 2022 (Distance) Research Engineer at Int. Sol. for Systems
Thesis: *"The effect of heat treatment on mechanical properties of additively manufactured 17-4 PH stainless steel"*

**Frank Brinkley** M.S. in ME in 2022 Research Engineer at ORNL
Thesis: *"The temperature dependent mechanical response of M250 maraging steel and its implications on WAAM"*

**Daniel Rios-Estremera** M.S. in ME in 2021 (Distance) Research Engineer at ERDC
Thesis: *"Modeling the ballistic limit of fragment simulating projectiles impacting A36 mild steel spaced armor configurations"*

**Emily McCabe** M.S. in ME in 2021* Ph.D. Student at Vanderbilt
Thesis: *"Evaluation of the effects of rotational speed on microstructural and mechanical properties of AFSD aluminum 6061"*

**Ryan Stokes** M.S. in ME in 2019 Ph.D. Student at MSU
Thesis: *"Characterizing the effects of build interruptions on the microstructure and mech. prop. of PBF processed Al-Si-10Mg"*

**Matthew Murray** M.S. in ME in 2020 (Distance) Research Engineer at ERDC
Thesis: *"Dynamic strength properties of structural steel at elevated rates of strain"*

**Thomas Allard** M.S. in CEE in 2019* Research Engineer at LANL
Thesis: *"Mechanical property development and numerical modeling of UHPC focused on isothermal curing conditions"*

**William Furr** M.S. in ME in 2019 Research Engineer at ERDC
Thesis: *"A Modular Open-Source Pre-Processing Tool for Finite Element Simulations of Additive Manufacturing Processes"*

## Graduate Student Mentees and Research Areas

| | | |
|---|---|---|
| **David Failla** | Ph.D. Candidate in ME | L-PBF Additive Manufacturing |
| **Abhijith Madabhushi** | Ph.D. Candidate in ME | Char Formation on Composites |
| **Courtney Morgan-Barnes** | Ph.D. Candidate in ME | Powder-Based Additive Manufacturing |
| **Logan Betts** | Ph.D. Candidate in ME | Wire-Arc DED Additive Manufacturing |
| **Matthew Register** | Ph.D. Student in ME | Wire-Arc DED Additive Manufacturing |
| **Dam Kim** | Ph.D. Student in ME (Distance) | FEA of Mg Degradation |
| **Emily Sousa** | Ph.D. Student in ME (Distance) | Additive Manufacturing |
| **Emmanuel Malakakis** | Ph.D. Student in ME (Distance) | FEA of Metal Deformation |
| **Nathan Pachel** | M.S. Student in ME | Composite Structures |
| **Caitlin Luke** | M.S. Student in ME | Metal-Based Additive Manufacturing |
| **Patrick Camacho** | M.S. Student in ME | Electromagnetic Response of Materials |
| **Ally Cummings** | M.S. Student in ME | Metal-Based Additive Manufacturing |
| **Stephan Sendelbach** | M.S. Student in ME (Distance) | Composite Structures |
| **C.J. Nguyen** | M.S. Student in CSE | ML-Based Modeling |
| **Clark Hensley** | M.S. Student in CSE | Metal-Based Additive Manufacturing |
| **Jean C. Santiago Padilla** | M.S. Student in CME (Distance) | Metal-Focused Material Modeling |

## Mentee Awards

**Reese Dunne** 2023 Graduate Research Fellowship Program (GRFP)
*National Science Foundation (NSF)*

**David Failla** 2021 SMART Scholarship Recipient
*Department of Defense*

**Reese Dunne** 2021 Astronaut Scholar, Astronaut Scholarship Recipient
*Astronaut Scholarship Foundation*

**Reese Dunne** 2021 Goldwater Scholar, Barry Goldwater Scholarship Recipient
*Goldwater Foundation*

**Reese Dunne** MSU Bagley College of Engineering Student Hall of Fame
*Spring 2023*

**Olivia Russell** MSU Bagley College of Engineering Student Hall of Fame
*Spring 2022*

**Caitlin Luke** MSU Bagley College of Engineering Student Hall of Fame
*Spring 2022*

**Emily McCabe** — MSU Bagley College of Engineering Student Hall of Fame
*Spring 2019*

**Ally Cummings** — 1st Place Oral Pres.., M.S. Student in Eng.
*Spring 2024 MSU Graduate Student Research Symposium*

**Matthew Register** — 1st Place Oral Pres., Ph.D. Student in Eng.
*Fall 2023 MSU Graduate Student Research Symposium*

**Caitlin Luke** — 2nd Place Oral Pres., M.S. Student in Eng.
*Fall 2023 MSU Graduate Student Research Symposium*

**Clark Hensley** — 3rd Place Oral Pres., M.S. Student in Eng.
*Fall 2023 MSU Graduate Student Research Symposium*

**Ally Cummings** — 2ndPlace Poster Pres., M.S. Student in Eng.
*Fall 2023 MSU Graduate Student Research Symposium*

**Brad Sampson** — 3rd Place Oral Pres., M.S. Student in Eng.
*Spring 2023 MSU Graduate Student Research Symposium*

**Patrick Camacho** — 2nd Place Poster Pres., M.S. Student in Eng.
*Spring 2023 MSU Graduate Student Research Symposium*

**Matthew Register** — 2nd Place Poster Pres., Ph.D. Student in Eng.
*Spring 2023 MSU Graduate Student Research Symposium*

**David Failla** — 3rd Place Poster Pres., Ph.D. Student in Eng.
*Spring 2023 MSU Graduate Student Research Symposium*

**Clark Hensley** — 1st Place Poster Pres., Applied Data Science Research Category
*Spring 2023 Undergraduate Research Symposium at MSU*

**Wilson Martinez Diaz** — 2nd Place Poster Pres., Bagley College of Engineering
*Spring 2023 Undergraduate Research Symposium at MSU*

**Darrock Flynn** — Honorable Mention Poster Pres., Use-Inspired Data Science Research Category
*Spring 2023 Undergraduate Research Symposium at MSU*

**Will Downs** — 1st Place Oral Pres., M.S. Student in Eng.
*Fall 2022 MSU Graduate Student Research Symposium*

**Reese Dunne** — 3rd Place Poster Pres., M.S. Student in Eng.
*Fall 2022 MSU Graduate Student Research Symposium*

**Logan Betts** — 1st Place Oral Pres., Ph.D. Student in Eng.
*Fall 2021 MSU Graduate Student Research Symposium*

**Matthew Register** — 2nd Place Oral Pres., Ph.D. Student in Eng.
*Fall 2021 MSU Graduate Student Research Symposium*

**Frank Brinkley** — 1st Place Poster Pres., M.S. Student in Eng.
*Fall 2021 MSU Graduate Student Research Symposium*

**Reese Dunne** — 1st Place Poster Pres., Biological Science and Eng.
*Spring 2021 Undergraduate Research Symposium at MSU*

**Caleb Foster** — 3rd Place Poster Pres., Physical Sciences and Eng.
*Spring 2019 Undergraduate Research Symposium at MSU*

**Caleb Foster** — 2nd Place Public Health Competition
*Spring 2019 Undergraduate Research Symposium at MSU*

## Honors

1. 2022 Outstanding Faculty Tech Innovation Award in Mechanical Engineering at MSU
2. 2021-2022 Bagley College of Engineering (BCoE) Academy of Distinguished Teachers Award Recipient
3. 2021 Outstanding Faculty Teaching Award in Mechanical Engineering at MSU
4. Finalist for the 2021-2022 Donald Zacharias Early Career Teaching Award at MSU
5. 2021 MSU Reveille 25 Recipient
6. 2020-2021 Bagley College of Engineering (BCoE) Teaching Award for Distance Learning Recipient
7. Pident's Fellowship at Georgia Tech (2010 - 2014)

8. Phase I Honors Recipient at Mississippi State University (2007)
9. Inducted into Chi Epsilon ($\chi\epsilon$), Civil Engineering Honor Society (2007)
10. Inducted into Tau Beta Pi (TBII), Engineering Honor Society (2006)

## MSU Service

**Faculty Senator for Engineering** ◆ Robert Holland Faculty Senate at MSU **2023 - Present**
**Committee Member** ◆ UCCC – University Committee on Courses and Curricula **2018 - Present**
**Vice Chair** ◆ UCCC – University Committee on Courses and Curricula **2023 - Present**
**Committee Member** ◆ IE – Institutional Effectiveness Committee **2018 - Present**
**Committee Member** ◆ Generative AI Task Force **Fall 2023**
**Committee Member** ◆ AI Standing Committee **Fall 2023 - Present**
**Faculty Advisor** ◆ Tau Beta Pi (TBP) – Engineering Honor Society **2023 - Present**
**Chief Faculty Advisor** ◆ Tau Beta Pi (TBP) – Engineering Honor Society **2018 - 2023**
**Committee Member** ◆ Additive Manufacturing Work Group **2017 - 2022**
**Committee Chair** ◆ Additive Manufacturing Work Group **2019 - 2022**
**Committee Member** ◆ Engineering Inclusive Excellence Council **2023 - Present**
**Committee Member** ◆ BCoE Courses and Curricula Committee **2022 - 2023**
**Teaching Coordinator** ◆ Department of Mechanical Engineering **2022 - 2023**
**Committee Member** ◆ Mechanical Engineering Faculty Search Committee **2017 - 2020**
**Committee Member** ◆ Mechanical Engineering Faculty Search Committee **2022 - 2023**
**Committee Member** ◆ Ph.D. Qualifying Exam Committee in Mechanical Engineering **2017 - Present**
**Committee Member** ◆ Undergraduate Committee **2017 - 2023**
**Committee Chair** ◆ Mechanical Systems Course Standardization Committee **2021 - 2023**
**Committee Member** ◆ BCoE Student Hall of Fame Selection Committee **2018**
**Judge** ◆ Dave C. Swalm School of Chemical Engineering Research Symposium **2021**
**Judge** ◆ Mississippi Academy of Sciences (MAS) Summer Science & Engineering Symposium **2022**
**Judge** ◆ MSU Graduate Student Research Symposium **Fall 2023**
**Internal Reviewer** ◆ MSU Office of Prestigious External Scholarships: Astronaut Scholarship **Spring 2024**

## Leadership and External Service

**Selected Participant** ◆ GWSW Phase II Grant Writing Workshop **2022 - 2023**
**Selected Participant** ◆ MCCTR Mentoring Academy **2022 - 2023**
**Reviewer** ◆ Journal of Mechanics and Physics of Solids **2016 - Present**
**Reviewer** ◆ The Center for Integrated Nanotechnologies User Proposals **2016 - Present**
**Reviewer** ◆ International Journal of Fatigue **2013 - Present**
**Reviewer** ◆ Acta Materialia **2021 - Present**
**Reviewer** ◆ Metals **2022 - Present**
**Session Chair** ◆ Solid Freeform Fabrication Symposium | Physical Modeling V: Process Modeling **2021**
**Co-Chair** ◆ WCCM | Modeling and Simulation of Advanced Manufacturing Processes of Metals **2024**

## Professional Organizations

The American Society of Mechanical Engineers (ASME) (2021 - Present)
American Society for Engineering Education (ASEE) (2012 - Present)
The Minerals, Metals, and Materials Society (TMS) (2010 - Present)

## Courses Taught

1. ME 4233/6233 **Fundamentals of FEA** Spring 2024 ◆ 68 students ◆ **3.60/4.0**
2. Spring 2023 ◆ 55 students ◆ **3.62/4.0**
3. Spring 2022 ◆ 61 students ◆ **3.66/4.0**

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|---|---|---|---|---|
| 4. | | Spring 2021 | 59 students | **4.4/5.0** |
| 5. | | Spring 2020 | 65 students | **4.6/5.0** |
| 6. | | Spring 2019 | 53 students | **4.5/5.0** |
| 7. | | Spring 2018 | 46 students | **4.5/5.0** |
| 8. | ME 4133/6133 **Mechanical Metallurgy** | Fall 2023 | 37 students | **3.68/4.0** |
| 9. | | Fall 2022 | 45 students | **3.60/4.0** |
| 10. | | Fall 2021 | 43 students | **3.58/4.0** |
| 11. | | Fall 2020 | 49 students | **4.4/5.0** |
| 12. | | Fall 2019 | 33 students | **4.4/5.0** |
| 13. | | Fall 2018 | 52 students | **4.5/5.0** |
| 14. | | Fall 2017 | 41 students | **4.4/5.0** |
| 15. | | Fall 2016 | 24 students | **4.3/5.0** |
| 16. | ME 3513 **Thermodynamics I** | Spring 2017 | 67 students | **4.6/5.0** |
| 17. | | Fall 2016 | 37 students | **4.8/5.0** |
| 18. | ME 4443/6443 **Mechanical Systems Design** | Spring 2017 | 62 students | **4.5/5.0** |
| 19. | ME 8243 **Finite Elements in ME** | Fall 2016 | 8 students | **5.0/5.0** |

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|---|---|---|---|
| 1. | ME 4000 DIS: **Thermal Effects of AM** | Summer 2017 | William Furr |
| 2. | ME 4000 DIS: **Rapid Prototyping with AM** | Fall 2017 | David Failla |
| 3. | ME 4000 DIS: **Determining the Breakpoint for AM** | Fall 2017 | Sandy Ritchie |
| 4. | ME 4000 DIS: **Jack Hatcher Manufacturing Project** | Fall 2017 | Marshall Davis |
| 5. | ME 4000 DIS: **Spherical Indentation of Tungsten** | Spring 2018 | Erin O'Quinn |
| 6. | ME 4000 DIS: **Mechanical Properties of Lattice Structures** | Spring 2018 | Julie Wyse |
| 7. | ME 4000 DIS: **Degradation of Biomedical Implants** | Spring 2018 | Hudson Chenault |
| 8. | ME 4000 DIS: **FEA of AM Lattice Structures** | Fall 2018 | Ben Brainerd |
| 9. | ME 4000 DIS: **Eng Ed: Effects of Group Work** | Spring 2019 | Elizabeth Whitehurst |
| 10. | ME 4000 DIS: **FEA of Additive Manufacturing** | Fall 2019 | Sophia Slusasz |
| 11. | ME 4000 DIS: **FEA for EcoCAR** | Fall 2019 | Patrick Mazzola |
| 12. | ME 4000 DIS: **Engineering Future in MS** | Spring 2020 | Belle Failla |
| 13. | ME 4000 DIS: **Instrumentation in ME** | Spring 2020 | Frank Brinkley |
| 14. | ME 4000 DIS: **Metal Additive Manufacturing** | Spring 2021 | Paul Smith |
| 15. | ME 4000 DIS: **Mech Appl in BioMed** | Spring 2021 | Caitlin Luke |
| 16. | ME 4000 DIS: **Metal Additive Manufacturing** | Spring 2022 | Jase Tatum |
| 17. | ME 4000 DIS: **FEA of Multi-Axis AM Tech** | Spring 2022 | Olivia Russell |
| 18. | ME 4000 DIS: **CFD of Bioreactors** | Spring 2023 | Darrock Flynn |
| 19. | ME 4000 DIS: **Finite Element Analysis** | Fall 2023 | Adam Easley |
| 20. | HON 4003 DIS: **Thermodynamics of AM** | Spring 2018 | Frank Brinkley |
| 21. | HON 4003 DIS: **Spherical Indentation of Tungsten** | Spring 2018 | Erin O'Quinn |
| 22. | HON 4003 DIS: **Computational Engineering Methods** | Fall 2022 | Clark Hensley |
| 23. | HON 4003 DIS: **Biodegradable Implants** | Spring 2023 | Khaoula Kamal |
| 24. | HON 4093 Honors Thesis: | Fall 2018 | Harrison Hunter |
| 25. | HON 4093 Honors Thesis: | Spring 2019 | Erin O'Quinn |
| 26. | HON 4093 Honors Thesis: | Spring 2023 | Clark Hensley |
| 27. | HON 4093 Honors Thesis: | Spring 2024 | Charlotte Thompson |
| 28. | ME 7000 DIS: **Thermodynamics of AM** | Spring 2018 | Ryan Stokes |
| 29. | ME 7000 DIS: **Inverse Design Methods** | Spring 2018 | Tate Fonville |
| 30. | ME 7000 DIS: **FEA of Concrete** | Spring 2018 | Thomas Allard |

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|---|---|---|---|
| 31. ME 7000 DIS: | **Numerical Modeling of Fatigue** | Spring 2018 | Fred Smith |
| 32. ME 7000 DIS: | **Modeling of Spinal Implants** | Summer 2018 | Colby Williams |
| 33. ME 7000 DIS: | **XFEM of Turbine Blades** | Summer 2018 | Fred Smith |
| 34. ME 7000 DIS: | **Eng Ed: Soft Skills in STEM** | Summer 2018 | Morgan Green |
| 35. ME 7000 DIS: | **Powder-Laser Interaction in AM** | Fall 2018 | Ryan Stokes |
| 36. ME 7000 DIS: | **Microstructure of AM Metals** | Fall 2018 | William Furr |
| 37. ME 7000 DIS: | **Materials Selection in Design** | Fall 2018 | Colby Williams |
| 38. ME 7000 DIS: | **Machine Learning with Simulation Data** | Spring 2019 | William Furr |
| 39. ME 7000 DIS: | **Friction in FEA** | Summer 2019 | Trey Leonard |
| 40. ME 7000 DIS: | **Thermal FEA of Polymers** | Fall 2019 | Sarajane Hill |
| 41. ME 7000 DIS: | **Design of Experiments for Polymer AM** | Spring 2020 | Sarajane Hill |
| 42. ME 7000 DIS: | **Heterogeneity in FE DED Models** | Summer 2020 | Matt Dantin |
| 43. ME 7000 DIS: | **FEA of Additive Manufacturing** | Summer 2020 | Khaoula Chougag |
| 44. ME 7000 DIS: | **FEA of Additive Manufacturing** | Summer 2020 | Chaimae Gouya |
| 45. ME 7000 DIS: | **AM of 17-4 PM** | Summer 2020 | Nick Hopkins |
| 46. ME 7000 DIS: | **Porosity and Defects in AM** | Fall 2020 | Matt Dantin |
| 47. ME 7000 DIS: | **Nonlinear FEA in Biomed Appl** | Fall 2020 | David Failla |
| 48. ME 7000 DIS: | **Viscoelasticity in FEA** | Summer 2021 | Morgan Cox |
| 49. ME 7000 DIS: | **Intermediate FEA** | Summer 2021 | Youness Afifi |
| 50. ME 7000 DIS: | **Intermediate FEA** | Summer 2021 | Loubna Ifqir |
| 51. ME 7000 DIS: | **Intermediate FEA** | Summer 2021 | Mohamed En-Nali |
| 52. ME 7000 DIS: | **Finite Element of Composites** | Fall 2021 | Naoufal Harich |
| 53. ME 7000 DIS: | **Porous Media Flow Simulations** | Fall 2021 | Easton Williams |
| 54. ME 7000 DIS: | **Inertial and Vibratory Design** | Fall 2021 | Brent Knight |
| 55. ME 7000 DIS: | **Plasticity Model for AM 17-4** | Fall 2021 | Nick Hopkins |
| 56. ME 7000 DIS: | **CEL FE Modeling** | Spring 2022 | Logan Betts |
| 57. ME 7000 DIS: | **FE Study of Process Parameters** | Spring 2022 | Matthew Register |
| 58. ME 7000 DIS: | **Impact Sims in FEA** | Spring 2022 | Ty Irwin |
| 59. ME 7000 DIS: | **Concrete Foundations** | Summer 2022 | Clint Balch |
| 60. ME 7000 DIS: | **Methods of Machining Composites** | Spring 2023 | Nathan Pachel |
| 61. ME 7000 DIS: | **Intermediate FEA** | Spring 2023 | Najoua Boutahar |
| 62. ME 7000 DIS: | **Comparison of Material Modeling in FE** | Spring 2023 | David Lichlyter |
| 63. ME 7000 DIS: | **FEA: Impact & Dmg Modeling** | Spring 2023 | Christopher Outland |
| 64. ME 7000 DIS: | **Steel Structures** | Summer 2023 | Clint Balch |
| 65. ME 7000 DIS: | **Fluid-Structure Interactions** | Fall 2023 | Nour Jamal |
| 66. ME 7000 DIS: | **Adv Mdling ABAQUS - Wave Mech** | Fall 2023 | Chris Outland |
| 67. ME 7000 DIS: | **FE Modeling of Welding** | Spring 2024 | Logan Betts |
| 68. ME 7000 DIS: | **FEM AM Thermal Model Fidelity** | Spring 2024 | Caitlin Luke |
| 69. ME 7000 DIS: | **Fundamentals of AM** | Spring 2024 | Patrick Camacho |
| 70. ME 7000 DIS: | **FE Mod of Surface Roughness** | Spring 2024 | Dam Kim |
| 71. ME 7000 DIS: | **Experiment design towards FEA** | Spring 2024 | David Lichlyter |
| 72. ME 7000 DIS: | **FE Mod of Coeff of Restitution** | Spring 2024 | Logan Callahan |
| 73. CME 7000 DIS: | **Inv Methods in Comp Modeling** | Spring 2024 | Jean Santiago Padilla |

## Outreach

**Guest Lecturer**, ABE 3813 Biophysical Properties of Materials — February 5, 2024
"Product-to-Market Process"

**Guest Lecturer**, ME 8011 Graduate Seminar — November 6, 2023
"Additive Manufacturing Research at MSU and in CMML"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society — October 2023
"Graduate School for Engineers: Why to Go and How to Choose"

**Panelist**, MSU Kinesiology Academic Culture Grad Seminar Series — October 6, 2023
"How to Train Undergraduate Research Students"

**Speaker**, U.S. Food and Drug Administration — September 25, 2023
"Test Method Development for Impaction of Interbody Fusion Devices,"

**Speaker**, ORED Seminar — September 15, 2023
"Collaborative Research: Tips for Success and Advice for Overcoming Obstacles,"

**Speaker**, UMMC MCCTR Seminar Series — April 27, 2023
"Towards a simulation framework for predicting residual stresses and bone remodeling around dental implants"

**Speaker**, ORED Advancing Collaborative Research — April 27, 2023
"Comprehensive evaluation of HA coatings to improve degradation characteristics of AMed porous Mg implants"

**Guest Lecturer**, hosted by MSU ASME Student Chapter — April 17, 2023
"FE Review: Statics and Mechanics of Materials"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society — March 2023
"Graduate School for Engineers: Why to Go and How to Choose"

**Guest Lecturer**, ABE 3813 Biophysical Properties of Materials — February 13, 2023
"Product-to-Market Process"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society — October 2022
"Graduate School for Engineers: Why to Go and How to Choose"

**Panelist**, Office of the President and the Robert Holland Faculty Senate — April 22, 2022
"Faculty Senate Roundtable Discussion"

**Panelist**, Climate Study Working Group — April 11, 2022
"Campus Climate for Learning, Living, and Working at MSU"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society — April, 2022
"Graduate School for Engineers: Why to Go and How to Choose"

**Speaker**, Additive Manufacturing (AM) Working Group — March 24, 2022
"Residual stresses in metal-based additive manufacturing"

**Speaker**, BCoE Engineering Discovery Day — March 24, 2022
"Researching the intersections of AM, modeling & simulation, and biomedical applications: CMML in ME"

**Panelist**, MSU Future Faculty Preparation Program — February 25, 2022
"Research and Scholarly Activity in Academia"

**Guest Lecturer**, HON 2091 Honors Forum IV — February 24, 2022
"Utilizing finite element modeling to predict mechanical response in Eng. applications"

**Guest Lecturer**, ME 4111 Professional Development — February 21, 2022
"Graduate School for Engineers: Pathways and Decision Points"

**Panelist**, BCoE Academic Insight — February 18, 2022
"Opportunities and Expectations in Mechanical Engineering"

**Panelist**, Faculty Development Task Force — December 2, 2021
"Perspectives on Required or Voluntary Instructor Training for MSU Faculty"

**Guest Lecturer**, GE 3513 Technical Writing (for ECE Majors) — November 9, 2021
"Engineering Ethics Roundtable Discussion"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society — October, 2021
"Graduate School for Engineers: Why to Go and How to Choose"

**Guest Lecturer**, ME 4111 Professional Development — October 4, 2021
"Graduate School for Engineers: Pathways and Decision Points"

**Invited Speaker**, 2021 FAA JAMS Technical Review Meeting — September 23, 2021
"Post-Crash Fire Forensic Analyis on Aerospace Composites"

**Speaker**, Department of Biomedical Materials Science, UMMC June 10, 2021
"Towards Next Generation Implant Design: An Overview of FE Modeling and Current Research Progress"

**Invited Speaker**, US Army ERDC Additive Manufacturing SUMMIT (virtual) May 18, 2021
"Functionally Graded Materials and Manufacturing"

**Student Chapter Meeting**, Mechanical Engineering Ladies Organization (MELO) March 23, 2021
"Undergraduate Research in Mechanical Engineering"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society March, 2021
"Graduate School for Engineers: Why to Go and How to Choose"

**Guest Lecturer**, ME 4111 Professional Development February 1, 2021
"Graduate School for Engineers: Pathways and Decision Points"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society October, 2020
"Graduate School for Engineers: What You Really Want to Know About It"

**Invited Speaker**, ARL Cold Spray & WAAM Meeting at WPI in Worchester, MA December 17, 2019
"Previous DED AM Experience and Migrating Towards WAAM"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society October, 2019
"Graduate School for Engineers: What You Really Want to Know About It"

**Invited Speaker**, Los Alamos National Laboratory July 31, 2019
"Progress in FE Modeling of Metal-Based AM Processes and Future Requirements for Simulation-Centric Design"

**Invited Speaker**, Technical Forum Talk, Medtronic in Memphis, TN June 10, 2019
"Coupling BME and ME for Advancement of Medical Devices: An Interdisciplinary Collaboration"

**Invited Speaker**, FedEx AM Consortium in Memphis, TN May 6, 2019
"Additive Manufacturing at MSU: Capabilities and Past Projects"

**Guest Speaker**, MS Alpha Chapter, Tau Beta Pi (TBP) Engineering Honor Society October, 2018
"Graduate School for Engineers: What You Really Want to Know About It"

**Guest Speaker**, Maker Education Summer Teacher Training at MSU July 11, 2018
"Additive Manufacturing: Producing a New Paradigm One Step at a Time"

**Guest Lecturer**, NSF REU Program at MSU June 2009
"An Introduction to Molecular Dynamics"

## Conference Presentations (Underline indicates mentee of MWP)

116. **Matthew W. Priddy** & Matthew Dantin. "An examination of distortion and residual stresses in thermo-mechanical FE simulations of AM components via the EMMI ISV model." 19th European Mechanics of Materials Conference (EMMC19), Madrid, Spain. May 29-31, 2024.

115. Charlotte Thompson, Evan Garrison, Lillian Dejean, Santanu Kundu, & **Matthew W. Priddy**. "Development of an Open-Source High Temperature FDM 3D Printer for High Performance Thermoplastic Materials." Spring 2024 Undergraduate Research Symposium, Mississippi State University. April 11-12, 2024.

114. Ally Cummings, Matthew Register, J. Logan Betts, & **Matthew W. Priddy**. "Finite Element Modeling for Thermomechanical Prediction of Wire-arc Directed Energy Deposition with ER120S-G." MSU Graduate Student Research Symposium, Mississippi State, MS, February 24, 2024.

113. Matthew Register, J. Logan Betts, & **Matthew W. Priddy**. "A Finite Element Modeling Approach to Dwell Time Optimized Maraging 250 Parts for Wire Arc Directed Energy Deposition." ASME International Mechanical Engineering Congress and Exposition (IMECE), New Orleans, LA, October 29 - November 2, 2023.

112. J. Logan Betts, Matthew Register, & **Matthew W. Priddy**. "Preliminary development of a high-throughput approach to calibrate finite element heat sources for wire arc directed energy deposition." ASME International Mechanical Engineering Congress and Exposition (IMECE), New Orleans, LA, October 29 - November 2, 2023.

111. Patrick Camacho, J. Logan Betts, & **Matthew W. Priddy**. "Development Of Representative Volume Element For Electromagnetic Characterization Of Heterogeneous Geomaterial." ASME International Mechanical Engineering Congress and Exposition (IMECE), New Orleans, LA, October 29 - November 2, 2023.

110. Ally Cummings, Matthew Register, J. Logan Betts, & **Matthew W. Priddy**. "Effect of Toolpath on the Thermomechanical Response for Finite Element Modeling of Wire-Arc Directed Energy Deposition." MSU Graduate Student Research Symposium, Mississippi State, MS, October 21, 2023.

109. Matthew Register & **Matthew W. Priddy**. "Finite Element Modeling of an Active Cooling Plate Design for Wire-DED of CP-Ti." MSU Graduate Student Research Symposium, Mississippi State, MS, October 21, 2023.

108. Clark Hensley, J. Logan Betts, & **Matthew W. Priddy**. "ODBPlotter: Open Source Improvements in Data Processing and Visualization for Wire Arc Additive Manufacturing." MSU Graduate Student Research Symposium, Mississippi State, MS, October 21, 2023.

107. Caitlin Luke, Alexis Graham, Micah Foster, Halleigh Faulkner, Alyna-Marie Janus, Tanner Jones, Jerald Redmond, MeLeah A. Henson, Rex Armstrong, Lauren B. Priddy, & **Matthew W. Priddy**. "Modification of benchtop impaction device to mimic cadaveric transforaminal lumbar interbody fusion (TLIF)." MSU Graduate Student Research Symposium, Mississippi State, MS, October 21, 2023.

106. **Matthew W. Priddy** & Alex Michelson. "SWAAHT – Development and Transition of HY80 Steel for Qualification to NAVSEA WIRE-DED Technical Publication." America Makes Fall TRX, Knoxville, TN, October 17-18, 2023.

105. Holger Jahr, Sophie McLay, Khaoula Kamal, Parker Odom, Reese Dunne, **Matthew W. Priddy**, & Lauren B. Priddy. "3D-printed absorbable metallic medical devices and their application potential." 31st Annual Meeting of the European Orthopaedic Research Society, Porto, Portugal, September 27-29, 2023.

104. David Failla Jr., Matt Dantin, Chuyen Nguyen, & **Matthew W. Priddy**. "Residual Stress Estimation in a Complex Additively Manufactured Component with an Internal State Variable Material Model." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

103. Haley Petersen, Bradley Sampson, David Failla Jr., **Matthew W. Priddy**, & Zack McClelland. "The Variation of Mechanical Properties of M300 Maraging Steel Manufactured with Varying Process Parameters in Laser Powder Bed Fusion." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

102. Matthew Register, Ryan Stokes, J. Logan Betts, Olivia Russell, & **Matthew W. Priddy**. "Experimental and Finite Element Comparison of 3-axis and 5-axis Wire Arc Directed Energy Deposition." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

101. J. Logan Betts, Matthew Register, & **Matthew W. Priddy**. "A Preliminary Understanding of Process-property Effects on the Thermal Response via High-throughput Finite Element Models of Wire Arc Direct Energy Deposition." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

100. Chuyen Nguyen, David Failla, Matthew Register, & **Matthew W. Priddy**. "An Evaluation of a Programmatic Method for the Generation of Finite Element Event Series for Additive Manufacturing Against Machine Print Paths." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

99. Caitlin Luke, Courtney Morgan-Barnes, Brad Sampson, Haley Doude, & **Matthew W. Priddy**. "FE Predictions of Residual Stresses in L-PBF Generated Ti-6Al-4V NIST Bridges." Solid Freeform Fabrication (SFF) Symposium, Austin, TX, August 14-16, 2023.

98. Kevon Scales, Seth Holton, Honor Elchos, Mahathir Bappy, Wenmeng Tian, **Matthew W. Priddy**, & Lauren B. Priddy. "Exploring the Impact of Hydroxyapatite (HA) Ratio in the Mechanical Response of PLGA-HA Composite Scaffolds." Summer 2023 Undergraduate Research Symposium, Mississippi State University. August 2, 2023.

97. Lillian Dejean, Charlotte Thompson,, & **Matthew W. Priddy**. "Component Selection and Requirements for an Open-Source High-Temperature 3D-Printer Capable of Printing Bio-Compatible Filaments." Summer 2023 Undergraduate Research Symposium, Mississippi State University. August 2, 2023.

96. Alexis Graham, Darrock Flynn, Charlotte Thompson, Sophie Jones, April Guo-Yue, Umamah Amer, Honor Elchos, Brooke Kouba, Jaydon Gibson, **Matthew W. Priddy**, & Lauren B. Priddy. "Design, development, and validation of a perfusion-compression bioreactor to study osteogenesis in bone explants." Mississippi IDeA Annual Conference, Hattiesburg, MS, July 27, 2023.

95. Jaydon Gibson, Micah Foster, J. Parker Jones, Chase Dedeaux, Travis Hagey, Lauren B. Priddy, & **Matthew W. Priddy**. "Development of a Portable Device to Measure Adhesion Strength of Gecko Toepads." Mississippi Academy of Sciences Summer Science and Engineering Research Symposium, Mississippi State University, July 25, 2023.

94. Tanner Jones, Caitlin Luke, Micah Foster, Halleigh Faulkner, Dani Janus, **Matthew W. Priddy**, & Lauren B. Priddy. "Replication of impact parameters from cadaveric lumbar interbody fusion using a benchtop device." Mississippi Academy of Sciences Summer Science and Engineering Research Symposium, Mississippi State University, July 25, 2023.

93. David Failla, Chuyen Nguyen, William M. Furr, & **Matthew W. Priddy**. "AMTech: An Event Series Pre-Processing Tool for the Thermo-Mechanical Modeling of Additive Manufacturing Processes." 17th US National Congress on Computational Mechanics (USNCCM17), Albuquerque, NM, July 23-27, 2023.

92. Abhijith Madabhushi, Santanu Kundu, Thomas Lacy, Charles Pittman, Dounia Boushab, Aniket Mote, Jaime Grunlan, & **Matthew W. Priddy**. "Char removal strategy for fire-forensic analysis of mechanically-failed aerospace carbon/epoxy composites." SAMPE 2023 & FAA JAMS 2023, Seattle, WA, April 18-20, 2023.

91. Naoufal Harich, **Matthew W. Priddy**, Thomas Lacy, Charles Pittman, & Santanu Kundu. "Effects of alternative jet fuel blends on aerospace-grade carbon/epoxy composites." SAMPE 2023 & FAA JAMS 2023, Seattle, WA, April 18-20, 2023.

90. **Matthew W. Priddy**. "From Mesoscale to Macroscale Modeling for Metal-Focused Applications." Symposium on Advances in Multiscale Mechanics and Materials Design, Georgia Institute of Technology. April 14, 2023.

89. April Guo-Yue, Alexis Graham, Umamah Amer, Charlotte Thompson, Darrock Flynn, Sophie Jones, **Matthew W. Priddy**, & Lauren B. Priddy. "Validating Osteogenic Differentiation of Bone Marrow-Derived Cells in 2D Culture for Use in a Custom 3D Bioreactor System." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

88. Sophie Jones, Khaoula Kamal, Katherine Flannigan, Adrian Andrews, **Matthew W. Priddy**, & Lauren B. Priddy. "Comprehensive Evaluation of Hydroxyapatite Coatings to Improve Degradation Characteristics of Additively Manufactured Porous Magnesium Implants." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

87. Kyle D. Lindsey, J. Logan Betts, Frank M. Brinkley, Bradley J Sampson, & **Matthew W. Priddy**. "Use of FDM AM of 316L Stainless Steel for Spaceflight Vehicles Adapted from the NASA L-PBF Standard (MSFC-STD-3716)." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

86. Clark Hensley, J. Logan Betts, Chuyen Nguyen, & **Matthew W. Priddy**. "ODBPlotter: An Open Source Data Processing and Visualization Tool for Wire Arc Directed Energy Deposition." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

85. Reese A. Dunne, Addison M. Green, Dam Kim, Lauren B. Priddy, & **Matthew W. Priddy**. "Development and implementation of a magnesium-based finite element degradation model for hydroxyapatite-coated orthopedic implants." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

84. Darrock Flynn, David P. Failla, Alexis Graham, Amirtaha Taebi, Lauren B. Priddy, & **Matthew W. Priddy**. "Computational Fluid Dynamics In a Perfusion Bioreactor." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

83. Wilson Martinez Diaz, David P. Failla, & **Matthew W. Priddy**. "Modular Framework for Finite Element Analysis of Lattice Structures and Application to Post-Lumbar Interbody Fusion Cage Design." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

82. Charlotte Thompson, Luke Wall, Travis J. Hagey, Lauren B. Priddy, & **Matthew W. Priddy**. "Construction of a Gecko Toe Angle Detachment Device for Estimating Adhesion Forces Among Gecko Species." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

81. Tanner Jones, Caitlin Luke, Micah Foster, Dani Janus, Halleigh Faulkner, Lauren B. Priddy, & **Matthew W. Priddy**. "Replication of impact parameters from cadaveric lumbar interbody fusion using a benchtop device." Spring 2023 Undergraduate Research Symposium, Mississippi State University. April 13-14, 2023.

80. David P. Failla Jr, Haley E. Petersen, Zackery B. McClelland, & **Matthew W. Priddy**. "Leveraging Spatial Gradation in Lattice Structure Development for Enhanced Energy Absorption from High-Rate Loads." The Minerals, Metals, and Materials Society (TMS) 2023 Annual Meeting and Exhibition, San Diego, CA. March 19-23, 2023.

79. Bradley J. Sampson, Haley E. Petersen, David P. Failla, & **Matthew W. Priddy**. "Mechanical Characterization of Functionally Graded Cellular Structures." Spring 2023 Graduate Student Research Symposium, Mississippi State University. February 25, 2023.

78. Matthew Register, J. Logan Betts, & **Matthew W. Priddy**. "Effects on residual stress due to thermal property input of low carbon steel in finite element modeling of the WAAM process." Spring 2023 Graduate Student Research Symposium, Mississippi State University. February 25, 2023.

77. J. Logan Betts, Matthew Register, & **Matthew W. Priddy**. "Preliminary development of a high-throughput approach to calibrate finite element heat sources for wire arc additive manufacturing." Spring 2023 Graduate Student Research Symposium, Mississippi State University. February 25, 2023.

76. Patrick Camacho, J. Logan Betts, & **Matthew W. Priddy**. "Simulation-based Comparison Of The Electromagnetic Response Of A Laminar And Heterogeneous Multi-phase Material." Spring 2023 Graduate Student Research Symposium, Mississippi State University. February 25, 2023.

75. David P. Failla Jr & **Matthew W. Priddy**. "A Numerical Approach to Predicting the Effects of Spatial Gradation in Lattice Structures." Spring 2023 Graduate Student Research Symposium, Mississippi State University. February 25, 2023.

74. Alexis Graham, Sophie Jones, Charlotte Thompson, Darrock Flynn, **Matthew W. Priddy**, & Lauren B. Priddy. "Custom Perfusion-Compression Bioreactor for Precise, Dynamic Compressive Loading of Bone Explants." Orthopaedic Research Society (ORS) Annual Meeting, Dallas, TX. February 10-14, 2023.

73. Honor Elchos, Alexis Graham, Darrock Flynn, **Matthew W. Priddy**, & Lauren B. Priddy. "Designing a Perfusion–Compression Bioreactor for Culture of Bone Explants." 2023 Mississippi Honors Conference, Fulton, MS. February 2023.

72. Alexis Graham, Sophie Jones, Charlotte Thompson, Darrock Flynn, **Matthew W. Priddy**, & Lauren B. Priddy. "Development of a Perfusion-Compression Bioreactor for Evaluating Implant Osseointegration." Fall 2022 Graduate Student Research Symposium, Mississippi State University. October 22, 2022.

71. Will Downs, Santanu Kundu, J. Logan Betts, Chuyen Nguyen, & **Matthew W. Priddy**. "Examining ULTEM 9085 by Fused Deposition Modelling with a Thermo-Mechanical Finite Element Analysis." Fall 2022 Graduate Student Research Symposium, Mississippi State University. October 22, 2022.

70. Reese A. Dunne, Addison M. Green, Dam Kim, Lauren B. Priddy, & **Matthew W. Priddy**. "Development and Implementation of a Magnesium-Based Finite Element Degradation Model for Hydroxyapatite-Coated Orthopedic Implants." Fall 2022 Graduate Student Research Symposium, Mississippi State University. October 22, 2022.

69. Liv Russell, David Failla, Matthew Register & **Matthew W. Priddy**, "Finite Element Modeling of Material Deposition for 5-axis Additive Manufacturing," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

68. Haley Petersen & **Matthew W. Priddy**, "A Literature Review of the Application of M300 Maraging Steel for Laser Powder Bed Fusion," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

67. Bradley Sampson, Courtney Morgan-Barnes, Ryan Stokes, Haley Doude, & **Matthew W. Priddy**, "Investigating the Relationship Between In-Process Quality Metrics and Mechanical Response in the L-PBF Process," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

66. David Failla & **Matthew W. Priddy**, "Numerical and Experimental Characterization of the Dynamic Properties of As-built 316L Components Produced via Laser Powder Bed Fusion," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

65. Ryan Stokes, Haley Doude, Linkan Bian, & **Matthew W. Priddy**, "Process Response of Martensitic 250 Stainless Steel Alloy + Wire Arc Additive Manufacturing with Cold Metal Transfer," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

64. Matthew Register & **Matthew W. Priddy**, "Effects Due to Variations in Thermal Properties of Maraging Steel for Finite Element Modeling of the WAAM Process," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

63. J. Logan Betts, Will Downs, Matt Dantin, & **Matthew W. Priddy**, "Examining the GPU Acceleration Speed-up for Finite Element Modeling of Additive Manufacturing," Solid Freeform Fabrication (SFF), University of Texas at Austin, July 25-27, 2022.

62. Wilson Martinez Diaz & **Matthew W. Priddy**. "Modular Framework for Lattice Structure Mechanical Simulations." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

61. Liv Russell, Matthew Register, David Failla, & **Matthew W. Priddy**. "Feasibility and Limitations of Finite Element Modeling of Wire Arc Additive Manufacturing." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

60. Will Downs, J. Logan Betts, Matthew Register, & **Matthew W. Priddy**. "Increment size effects on the thermal response of finite element modeling of AM." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

59. Kyle Lindsey, J. Logan Betts, Frank M. Brinkley, Bradley J. Sampson, & **Matthew W. Priddy**. "Comparison of FDM and L-PBF Additive Manufacturing of 316L Stainless Steel." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

58. Halleigh Faulkner, Dani Janus, Caitlin Luke, Alexis Graham, **Matthew W. Priddy**, & Lauren B. Priddy. "Customizable Benchtop Drop Weight Device Simulates Impact Waveform of TLIF Procedure." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

57. Darrock Flynn, Alexis Graham, Charlotte Thompson, Honor Elchos, Lauren B. Priddy, & **Matthew W. Priddy**. "Validation of a perfusion bioreactor with mechanical stimulus for promotion of bone growth." Summer 2022 Undergraduate Research Showcase, Mississippi State University, August 2, 2022.

56. Sophie Jones, Alexis Graham, Luke Nichols, Charlotte Thompson, Darrock Flynn, Kamryn Clymer, Lisa Yang, **Matthew W. Priddy**, & Lauren B. Priddy. "Advancement of Methods for Quantifying Osteogenesis in 2D Static and 3D Dynamic Culture." Spring 2022 Undergraduate Research Symposium, Mississippi State University, April 14, 2022.

55. Caitlin Luke, Alexis Graham, Frank Brinkley, Jaden Bennett, Cody Gressett, Micah Foster, Zach Hooper, Lauren B. Priddy, & **Matthew W. Priddy**. "Replication of cadaver TLIF procedure impact waveform in benchtop setting." Spring 2022 Undergraduate Research Symposium, Mississippi State University, April 14, 2022.

54. Charlotte Thompson, Alexis Graham, Sophie Jones, Darrock Flynn, Lauren B. Priddy, & **Matthew W. Priddy**. "Design of a Prototype (Low-Cost) Mechanical Loading Bioreactor." Spring 2022 Undergraduate Research Symposium, Mississippi State University, April 14, 2022.

53. Harrison Williams, David Korba, Like Li, & **Matthew W. Priddy**. "Comparison of cellular automata and continuum phase-field models for grain growth estimation." Spring 2022 Undergraduate Research Symposium, Mississippi State University, April 13, 2022.

52. Alexis Hughes, Loubna Ifqir, J. Logan Betts, **Matthew W. Priddy**, & Lauren B. Priddy. "The effect of screw length on torque during insertion into synthetic bone." Mississippi Academy of Sciences Annual Meeting, Biloxi, MS, March 31-April 1, 2022.

51. Alexis Hughes, Loubna Ifqir, J. Logan Betts, **Matthew W. Priddy**, & Lauren B. Priddy. "The effect of screw length on torque during insertion into synthetic bone." Annual Biomedical Research Conference for Minority Students, Virtual, November 10-13, 2021.

50. Frank Brinkley, J. Logan Betts, Loubna Ifqir, Lauren B. Priddy, & **Matthew W. Priddy**. "An Opensource Bone Screw Insertion Apparatus." Fall 2021 Graduate Student Research Symposium, Mississippi State University. October 23, 2021.

49. J. Logan Betts & **Matthew W. Priddy**. "Towards an Electromagnetic Modeling and Simulation Framework for Estimating Composition of Cementitious Geomaterials." Fall 2021 Graduate Student Research Symposium, Mississippi State University. October 23, 2021.

48. Matthew Register & **Matthew W. Priddy**. "A Sequentially Coupled Thermomechanical Model for Wire Arc Additive Manufacturing of M250." Fall 2021 Graduate Student Research Symposium, Mississippi State University. October 23, 2021.

47. David Failla & **Matthew W. Priddy**. "Deformation Response of AL 7085-T711 from Low-Energy Projectiles." Fall 2021 Graduate Student Research Symposium, Mississippi State University. October 23, 2021.

46. Alexis Hughes, Loubna Ifqir, J. Logan Betts, **Matthew W. Priddy**, & Lauren B. Priddy. "The effect of screw length on torque during insertion into synthetic bone." Mississippi Health Disparities Conference, Biloxi, MS, August 4, 2021.

45. Micah Foster, Caitlin Luke, Cody Gressett, Jaden Bennett, Zach Hooper, **Matthew W. Priddy**, & Lauren B. Priddy. "Benchtop device for simulating spinal implant impact scenarios." Summer 2021 Undergraduate Research Symposium, Mississippi State University. August 4, 2021.

44. Arvind Loganathan, J. Logan Betts, & **Matthew W. Priddy**. "Modeling Crestal Bone Loss Around Dental Implants Using Finite Element Analysis." Summer 2021 Undergraduate Research Symposium, Mississippi State University. August 4, 2021.

43. Addison Green & **Matthew W. Priddy**. "Prediction of Plasticity Models using Neural Networks." Summer 2021 Undergraduate Research Symposium, Mississippi State University. August 4, 2021.

42. Darrock Flynn, Lauren B. Priddy, & **Matthew W. Priddy**. "Approach for Applying Mechanical Stimulus in Bone Remodeling Within a Bioreactor." Summer 2021 Undergraduate Research Symposium, Mississippi State University. August 4, 2021.

41. Harrison Williams & **Matthew W. Priddy**. "Comparison of phase-field and cellular automata models to simulate microstructure evolution during recrystallization of additively manufactured 316L austenitic stainless steel." Summer 2021 Undergraduate Research Symposium, Mississippi State University. August 4, 2021.

40. Frank Brinkley, J. Logan Betts, and **Matthew W. Priddy**, "An Initial Evaluation of Process-property Relations for FDM produced 316L Stainless Steel," Solid Freeform Fabrication (SFF), University of Texas at Austin, August 2-4, 2021.

39. J. Logan Betts, Frank Brinkley, and **Matthew W. Priddy**, "Cost Analysis of Metal Additive Manufacturing via FDM Desktop 3D Printers," Solid Freeform Fabrication (SFF), University of Texas at Austin, August 2-4, 2021.

38. Matthew Register and **Matthew W. Priddy**, "Towards the Residual Stress Prediction in Wire Arc Additive Manufactured Parts Using a Finite Element Thermomechanical Model," Solid Freeform Fabrication (SFF), University of Texas at Austin, August 2-4, 2021.

37. David Failla and **Matthew W. Priddy**, "A Numerical Study Showing the Impacts of Dwell Time during the Laser Powder Bed Fusion Process," Solid Freeform Fabrication (SFF), University of Texas at Austin, August 2-4, 2021.

36. Megha Satpathy, Yuanyan Duan, J. Logan Betts, **Matthew W. Priddy**, and Jason Griggs, "Effects of Bone Remodeling on the Lifetime of Dental Implants," International Association for Dental Research General Session, July 21-24, 2021.

35. Adrain Andrews, Sophie Jones, Nathan Risley, **Matthew W. Priddy**, & Lauren B. Priddy. "Degradation analysis of additively manufactured WE43 magnesium alloy for orthopedic applications." Undergraduate Research Symposium, Mississippi State University. April 8-9, 2021.

34. Reese A. Dunne, J. Logan Betts, Addison M. Green, Lauren B. Priddy, & **Matthew W. Priddy**. "Development and implementation of a magnesium-based finite element degradation model for orthopedic implants." Spring 2021 Undergraduate Research Symposium, Mississippi State University. April 8-9, 2021.

33. Nate Hyams, Elizabeth Whitehurst, & **Matthew W. Priddy**. "Optimization of Groupwork within Engineering Education." Spring 2021 Undergraduate Research Symposium, Mississippi State University. April 8-9, 2021.

32. Harrison Williams & **Matthew W. Priddy**. "Cellular Automata Simulation for Microstructural Estimation during Wire-Arc Additive Manufacturing." Spring 2021 Undergraduate Research Symposium, Mississippi State University. April 8-9, 2021.

31. Logan Betts & **Matthew W. Priddy**. "A Finite Element Approach to Modeling Bone-Screw Pullout." Fall 2020 Undergraduate Research Symposium, Mississippi State University. October 21-23, 2020.

30. Matthew Dantin and **Matthew W. Priddy**. "Mechanical Modeling of Thermally Induced Residual Stresses and Distortion of Ti-6Al-4V Double Track Thin Walls Fabricated with Different Scan Strategies." ASME International Mechanical Engineering Congress & Exposition (IMECE), Virtual. November, 16 - 19, 2020.

29. David Failla and **Matthew W. Priddy**. "Comparison of Finite-Element Methodologies Used for Predicting Final Part Distortion and Residual Elastic Strains in Selective Laser Melting Additively Manufactured Parts." ASME International Mechanical Engineering Congress & Exposition (IMECE), Virtual. November, 16 - 19, 2020.

28. Inderjot Kaur, Nanqiao Wang, Prashant Singh, Like Li, and **Matthew W. Priddy**. "Effective thermal conductivity of high-porosity octet-truss lattice structures." 5th Thermal and Fluids Engineering Conference, New Orleans, LA. April 5-8, 2020.

27. Matthew Dantin and **Matthew W. Priddy**. "Residual stress and distortion modeling of a LENS Ti-6Al-4V Thin wall using the evolving microstructural model of inelasticity." The Minerals, Metals, and Materials Society (TMS) 2020 149$^{th}$ Annual Meeting and Exhibition, San Diego, CA. February 23 - 27, 2020.

26. Weitong Chen, Luke Nichols, Frank Brinkley, Kelson Bohna, Wenmeng Tian, **Matthew W. Priddy**, & Lauren B. Priddy (2019). "Investigation of the effects of alkali treatment and nano-hydroxyapatite coating on 3D printed polylactic acid scaffolds." 31st Annual Meeting of the International Society for Ceramics in Medicine, New Orleans, LA. November 14-17, 2019.

25. Courtney Morgan, Ryan Stokes, Joseph Young, Linkan Bian, **Matthew W. Priddy**, Haley Doude, and Jacob Easley. "Effects of recycling PREP and Plasma atomized Ti-6Al-4V powder from LENS process." Materials Science and Technology (MS&T) 2019 Technical Meeting and Exhibition, Portland, OR. September 29 - October 3, 2019.

24. Jacob Easley, Joseph Young, **Matthew W. Priddy**, and Haley Doude. "Additive manufacturing of propellant tank and structural supports of CubeSat cold gas propulsion system." AIAA Propulsion and Energy Forum and Exposition, Indianapolis, IN. August 19-22, 2019.

23. Caroline Schaade & **Matthew W. Priddy**. "Ti-64 Porous Hip Implant to Reduce Stress Shielding." 2019 Biomedical Engineering Society Annual Meeting, Philadelphia, PA. October 16-19, 2019.

22. Caroline Schaade & **Matthew W. Priddy**. "Ti-64 Porous Hip Implant to Reduce Stress Shielding." Summer 2019 Undergraduate Research Symposium, Mississippi State University. August 2, 2019.

21. Caleb Foster, David Failla, & **Matthew W. Priddy**. "Porous spinal implants using additive manufacturing." Spring 2019 Undergraduate Research Symposium, Mississippi State University. April 16, 2019.

20. Erin O'Quinn & **Matthew W. Priddy**. "Spherical Indentation of Tungsten." Spring 2019 Undergraduate Research Symposium, Mississippi State University. April 16, 2019.

19. Matthew Dantin, William Furr, and **Matthew W. Priddy**. "Towards an open-source, preprocessing framework for simulating material deposition for a directed energy deposition process." 29th Annual International Solid Freeform Fabrication (SFF) Symposium, Austin, TX. August 2018.

18. Emily McCabe, Ebrahim Asadi, & **Matthew W. Priddy**. "Nanoindentation of Additively Manufactured Ti-6Al-4V Specimens." 2018 Biomedical Engineering Society Annual Meeting, Atlanta, GA. October 17-20, 2018.

17. Weitong Chen, Julie Wyse, Frank Brinkley, **Matthew W. Priddy**, & Lauren Priddy. "Investigation of the Effects of Hydroxyapatite Coating and Pore Size of 3D Printed Polylactic Acid." 2018 Biomedical Engineering Society Annual Meeting, Atlanta, GA. October 17-20, 2018.

16. Weitong Chen, Julie Wyse, Frank Brinkley, **Matthew W. Priddy**, & Lauren Priddy. "Characterization of surface properties and compressive modulus of 3D printed polylactic acid scaffolds." 2018 Mississippi Academy of Sciences Summer Student Science Symposium, Mississippi State University. July 26, 2018.

15. Ben Brainerd & **Matthew W. Priddy**. "Automated Generation and Deformation of Octet Trusses Using 3D Modeling Software." Summer 2018 Undergraduate Research Symposium, Mississippi State University. August 1, 2018.

14. Erin O'Quinn & **Matthew W. Priddy**. "A survey of spherical indentation methods to investigate properties of irradiated tungsten." Spring 2018 Undergraduate Research Symposium, Mississippi State University. April 13, 2018.

13. Julie Wyse, Frank Brinkley, Weitong Chen, Lauren Priddy, & **Matthew W. Priddy**. "Biodegradable Implant to Support Bone Deficit and for the Promotion of Bone Regrowth." Spring 2018 Undergraduate Research Symposium, Mississippi State University. April 13, 2018.

12. Frank Brinkley, Weitong Chen, & **Matthew W. Priddy**. "Thermodynamic Efficiency of Additive Manufacturing of Poly Lactic Acid by Fused Deposition Modeling." Spring 2018 Undergraduate Research Symposium, Mississippi State University. April 13, 2018.

11. **Matthew W. Priddy**, Jordan Weaver, Noah Paulson, Soumya Mohan, Donald S. Shih, Surya Kalidindi, David L. McDowell. "Practical Method for Inverse Design Exploration of Fatigue Resistant Ti Alloys." Materials Science and Technology (MS&T) 2016 Technical Meeting and Exhibition, Salt Lake City, UT. October 23-27, 2016.

10. Noah Paulson, **Matthew Priddy**, Surya Kalidindi, David McDowell. "Rapid Evaluation of Titanium Microstructures for Fatigue Resistance through Computationally Efficient Localization Approaches." The Minerals, Metals, and Materials Society (TMS) 2016 145th Annual Meeting and Exhibition, Nashville, TN. February, 14 - 18, 2016.

9. **Matthew W. Priddy**, Jordan Weaver, Noah Paulson, Donald S. Shih, Surya Kalidindi, David L. McDowell. "Rapid Design Exploration of Ti-6Al-4V with Combined Experimental and Simulation Tools." 3rd World Congress on Integrated Computational Materials Engineering (ICME), Colorado Springs, CO. May 31 - June 4, 2015.

8. **Matthew W. Priddy**, Noah Paulson, Surya Kalidindi, David L. McDowell. "Strategies for Rapid Parametric Assessment of Microstructure-Sensitive Fatigue for HCP Systems." 4th International Conference on Material Modeling, Berkeley, CA. May 27 - 29, 2015.

7. **Matthew W. Priddy**, Jordan Weaver, Surya Kalidindi, David L. McDowell. "Spherical Nanoindentation and Local Crystal Plasticity Modeling of Ti-6Al-4V." The Minerals, Metals, and Materials Society (TMS) 2015 144th Annual Meeting and Exhibition, Orlando, FL. March 15-19, 2015.

6. **Matthew W. Priddy**, David L. McDowell. "Crystal Plasticity Modeling and Cyclic Loading Experiments of Mg AZ31." The Minerals, Metals, and Materials Society (TMS) 2014 143rd Annual Meeting and Exhibition, San Diego, CA. February 16-20, 2014.

5. **Matthew W. Priddy**, David L. McDowell. "Microstructure-Sensitive Design of Structural Metals." Pipeline Research Council International (PRCI) 2014 Research Exchange Meeting, Atlanta, GA. February 4-6, 2014.

4. **Matthew W. Priddy**, David L. McDowell. "The Investigation of Deformation Modes of Magnesium with Crystal Plasticity." The Minerals, Metals, and Materials Society (TMS) 2013 142nd Annual Meeting and Exhibition, San Antonio, TX. March 3-7, 2013.

3. **Matthew W. Priddy**, David L. McDowell. "The Investigation of Deformation Modes of Magnesium with Crystal Plasticity." Georgia Tech Research and Innovation Conference, Atlanta, GA. February 12, 2013.

2. **Matthew W. Priddy**, David L. McDowell. "The Use of Crystal Plasticity Finite Element Method to Investigate Slip and Twinning in Pure Magnesium." Society of Engineering Science (SES) 49th Annual Technical Meeting, Atlanta, GA. October 10-12, 2012.

1. **Matthew W. Priddy**, Donald K. Ward, Philip M. Gullett. "Local Stress and Strain Analysis of Atomistic Simulations." The Minerals, Metals, and Materials Society (TMS) 2010 139th Annual Meeting and Exhibition, Seattle, WA. February 14-18, 2010.