



MISSISSIPPI STATE UNIVERSITY™  
— JAMES WORTH —  
**BAGLEY**  
COLLEGE OF ENGINEERING

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## Andrew Moran

896 Carolina Place

Jackson, MO 63755

(573) 382-8858

Arm950@msstate.edu

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## Academic History

Currently, I am a Sophomore pursuing a degree in Biomedical Engineering with a minor in physics. I have not only completed but excelled in Calculus I-IV and will have completed Physics I-III by summer 2020. I am enrolled and have also completed several courses in Engineering Mechanics and all the components therein. While math is vital to an applicant, I also will have completed all inorganic and organic chemistry classes by summer 2020.

- 3.79 gpa in a broad rigorous curriculum.
- Presidents List member 2 semesters thus far.
- Sufficiently Bilingual in English and Spanish.
  - Exemplary performance in Spanish classes since 7<sup>th</sup> grade.
- Member of Mississippi State's Engineering Accelerate program.

- Allows qualified students to complete a Master's degree in 5 years.

## Research

Throughout my career at Mississippi State I have engaged in several research projects on and off campus from several different fields, including a publication my freshman year in Biomedical Research. Off campus, I partner with an Orthopedic Surgeon performing ongoing research on novel surgical techniques.

- Assisted in research exploring the mechanical and histological characteristics of viscoelastic substances, specifically, porcine brain tissue.
  - Funded by the NFL.
  - Publication October 2019
- Assisted in the research of short and prolonged vibrations on back pain. +
- - Incremental vibrations induced on rats, then tested for sensitivity. Blood was then drawn and analyzed for pain tracers.
  - Funded by the United States Military.
- Surgical assistant in research exploring the efficiency of genetically edited bacteriophages in the elimination of Osteomyelitis bacteria.
  - Bacteriophage genetically edited to only consume Osteomyelitis.
  - Screws contaminated with Osteomyelitis bacteria were drilled into the Femur to induce infection.
    - Allowed to fester for a week.

- After the allotted time, the screws were removed, and the genetically edited bacteriophage was applied using an alginate hydrogel. Other rats received antibiotics, a mix, and neither.
- Goal was to eliminate antibiotics in the attempt to halt bacterial resistance.
- Partnered with Orthopedic Surgeon Dr. David Macias to explore novel surgical techniques in repairing plantar plate tears in the first and second toes.
  - Data mined surgical records for analysis. Looked for pre and post-op pain records and different strength tests.
  - Examined physical therapy records for progress post-op.

## Leadership

I have been involved at Mississippi State since my freshman year. I participated in the Student Association, which governs the student body and involved myself in other clubs as well.

- Member of the Freshman Council
  - Organization dedicated to implementing ideas to make the transition from high school to college smoother.
  - Acted as a liaison between the council and the senate as the council procured promising ideas.
- Counselor at New Maroon Camp
  - Organization with the mission to transition students from high school to college.

- Led a group of 18 freshman students through the activities that week and answered any questions they had.
- Showed students the campus in greater detail and helped them create memories, relationships, and confidence going into the coming academic season.

## Memberships

Throughout my academic career I've had the opportunity to be a part of several academic memberships.

- Member of the Mississippi State Shakouls Honors College.
- Member of Mississippi State's Accelerate Engineering program.
  - Program that allows eligible students to receive a Masters degree in 5 years.
- Member of the Phi Kappa Phi honor society.
  - Oldest, most selective honor society of all academic disciplines.