# Emily J. Miller

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## EDUCATION

**Bachelor of Science in Biological Engineering with Biosystems Specialization, *summa cum laude*** May 2022
Minors in Engineering Innovation, Biomolecular Engineering GPA: 3.90/4.00
University of Florida, Gainesville, FL

## RESEARCH EXPERIENCE

**Science Undergraduate Laboratory Internship at the National Renewable Energy Laboratory**

*Biohydrogen Intern (Bioenergetics Group) | Aug 2022 – Jul 2023*

- Engineer metabolism of new *C. thermocellum* strains for increased hydrogen production and hemicellulose consumption
- Independently conduct plasmid design, Q5 Hi-Fi PCR, and protein fractionation; use HPLC and GC
- Meet with project mentor weekly to suggest project ideas and directions
- Conduct literature reviews to determine future areas of interest

*Biohydrogen Intern (Bioenergetics Group) | Jun 2021 – Aug 2021*

- Increase hydrogen production yield in *C. thermocellum* by 17% through metabolic engineering
- Independently conduct electroporation transformation, colony PCR, solution creation, and use anaerobic chamber
- Design and present poster and technical paper summarizing findings of the project to 50 symposium attendees

**Engineering Research**

*Undergraduate Research Assistant (Molecular Engineering, Denard Lab) | Jan 2022 – Jun 2022*

- Head new yeast tandem display system project
- Independently conduct DNA gel purification, Golden Gate Assembly, Gibson Assembly
- Present research updates and journal articles at weekly lab meetings
- Successfully transition project to new leader via physical documentation and end-of-work presentation

*Undergraduate Research Assistant (Bioprocessing, Pullammanappallil Lab) | Mar 2021 – Jun 2021*

- Record pH and spectrophotometry measurements for algae specimens to provide data for algal biofuel research
- Assess sugar and lipid production of two different culture conditions for algae strains

*Undergraduate Research Assistant (Environmental Modeling, Todd-Brown Lab) | May 2020 – Dec 2020*

- Predict carbon stocks using R to inform government of NWT, Canada in their designation of Proposed Protected Areas
- Analyze scientific literature to gather citations for 8 computational model parameters
- Create original graphics using R to demonstrate complex mathematical and environmental processes
- Develop and present virtual symposium to 30 attendees in collaboration with other lab members

**UF Integrated Product and Process Design**

*Team Leader, Viticultural Risk Report Service (Terraview) | Aug 2021 – May 2022*

- Lead team of 5 engineers working 15 hr/week to create a wildfire prediction ML model following design specifications
- Collaborate twice weekly with industry liaisons to update about project progress and receive feedback
- Devise and deliver 8 presentations documenting design process

## PRESENTATIONS AND PUBLICATIONS

**Miller E.J.,** Croft T.J., Chou K.J. Substituting redox equivalents for greater hydrogen production in *Clostridium thermocellum*. Poster presented at internal NREL intern symposium; August 2021; Golden, CO.

**Miller E.J.,** Croft T.J., Chou K.J. Conferring hemicellulose consumption for hydrogen production from waste biomass in *Clostridium thermocellum*. Poster presented at internal NREL intern symposium; December 2022; Golden, CO.

## TEACHING EXPERIENCE

**University of Florida Department of Mechanical and Aerospace Engineering**

*Teaching Assistant (Engineering Mechanics - Statics; Mechanics of Materials) | Aug 2020 – Dec 2021*

- Lead 150 guided groupwork sessions during class time, host weekly office hours, and answer questions from 120 students
- Prepare content for and host 3 end-of-semester review sessions to prepare students for final examinations

## SKILLS

**Laboratory equipment:** anaerobic chamber, autoclave, centrifuge, gas chromatography, high-performance liquid chromatography, NanoDrop, pipetting, scales, spectrophotometry, thermocycler

**Laboratory techniques:** biosafety training, culturing of *S. cerevisiae*, *E. coli*, *C. thermocellum*, DNA cleaning/concentration, electroporation, enzyme assay, fluorescence-activated cell sorting (FACS), gel electrophoresis, gel purification, inoculation, media preparation, OD measurements, PCR, plasmid design, plasmid preparation, protein fractionation, protein gel, SDS and SOP training, technical writing

**Software:** Python 3, R, Vensim, SolidWorks, Adobe Illustrator, Adobe Premiere Pro

**Coursera:** Mathematical Biostatistics Bootcamp 1 & 2 (Johns Hopkins University) | *Jul 2022, Aug 2022*

## AWARDS & HONORS

- NREL Bioenergetics Group BRAVO! Award | *Nov 2022*
- President's Honor Roll | *Dec 2019, Dec 2020*
- Dean's List | *Dec 2018, May 2019, May 2021, May 2022*
- Offered Science Undergraduate Laboratory Internship at Oak Ridge National Lab; cancelled due to COVID-19 | *Mar 2020*
- Member, Engineering Leadership Circle (Epsilon Lambda Chi) | *May 2021 – May 2022*
- Member, Tau Beta Pi | *inducted Apr 2021*

## LEADERSHIP

**Engineering Ambassadors**

- Represent the UF Herbert Wertheim College of Engineering as an official student liaison between industry, alumni, faculty, and students by promoting leadership, providing service, and shaping future engineers

*Tours Committee Chair | Dec 2021 – May 2022*

- Instruct new members about tour route and content via series of workshops
- Coordinate over 100 tours through communication with the college, prospective students, and members of EA

*Executive Vice President | Nov 2020 – Nov 2021*

- Create organization budget and present to Dean of Students for approval
- Conduct new member recruitment to induct 21 new Engineering Ambassadors from a pool of 60 applicants

*Special Events Committee Chair | May 2020 – Nov 2020*

- Plan events for over 200 attendees, including question-and-answer and speaker series events related to the HWCOE
- Collaborate with other organizations in the College of Engineering to host joint events

**Reinvented Magazine**

- 501(c)(3) nonprofit magazine dedicated to reinventing the perception of women in STEM

*Writing Director | Sep 2019 – Jan 2022*

- Collaborate and host weekly meetings with Executive Writing Directors to discuss article progress and content ideas
- Proofread, edit, and evaluate articles by staff and guest writers
- Publish 3 original articles

**Phi Sigma Rho Sorority**

- National sorority for women in engineering promoting high standards of personal integrity, respect, and character

*Vice President of Communications and Records | May 2020 – May 2021*

- Maintain weekly communication and provide updates of the sorority proceedings for over 80 members
- Use software to schedule text reminders to keep sorority members on track to achieve semesterly required participation