

BLAKE A. FORET

PH.D. STUDENT, RESEARCH ENGINEER

EDUCATION

Doctor of Philosophy in Systems Engineering, Concentration in Chemical Engineering

University of Louisiana | Lafayette, LA | June 2023 - Present

Dissertation: "Optimization and Production of Green, Wood Bioadhesives by Utilization of Waste Proteins Derived from Wastewater Solids"

Advisor: Dr. Mark E. Zappi, P.E.

Master of Science in Engineering, Concentration in Chemical Engineering

University of Louisiana | Lafayette, LA | May 2025 | GPA: 3.92

Non-Thesis Reports: "An Overview of the Potential for Municipal Wastewater Treatment Plants to Be Integrated into Urban Biorefineries for the Production of Sustainable Bio-Based Fuels and Other Chemicals", and "A Review of Current and Emerging Technologies for the Sustainable Utilization of Solar Energy in Water Disinfection"

Advisor: Dr. Mark E. Zappi, P.E.

Bachelor of Science in Chemical Engineering, Concentration in Biomedical Engineering, Minors in Mathematics and Chemistry

University of Louisiana | Lafayette, LA | May 2023 | GPA: 3.55

Cosmetology License

Omega Institute of Cosmetology | Houma, LA | February 2016

Louisiana State Board of Cosmetology

WORK EXPERIENCE

Energy Assessment and Outreach Engineer

Energy Institute of Louisiana | University of Louisiana, Lafayette, LA | Sept 2025 - Present |

- Writing and posting technical summaries of technologies
- Writing and posting technical summaries on EIL projects
- Providing engineering assessments of developing systems
- Designing, launching, and maintaining technical-based communications vectors for tech transfer inclusive of websites, project summaries, twitter accounts, and facebook
- Presenting of technology overviews and data results at conferences and professional meetings
- Assisting with implementation of tech transfer to stakeholders
- Performing techno-economic and life cycle assessments on technologies

Graduate Research Assistant

University of Louisiana, Lafayette, LA | June 2023 - Present | Louisiana Board of Regents funded

- Develop protein-based bioadhesives from WWTP biosolids.
- Design and model wastewater treatment processes for sustainability and resource recovery.
- Conduct mechanical (UTM) and analytical (FTIR, LC-MS, ICP) testing.
- Evaluate water quality and treatment technologies (nutrients, solids, contaminants).
- Perform economic, risk, and sensitivity analysis.
- Support process optimization and circular systems research.

Engineering Analyst

Precision Engineering Solutions, New Iberia, LA | June 2022 - March 2023

- Mechanical and chemical testing of materials by using machinery and techniques such as OES, UTM, Charpy Impact, Brinell/Rockwell Hardness, Vickers/Knoop Microhardness, Microscopes, and SEM
- Researched materials, conducted failure analysis, and contributed to the writing of professional reports to indicate the cause/causes of failure
- Actively participated in group meetings for planning the workflow of many active jobs among team members
- Assisted in the creation of ISO Quality Manual Documentation for ISO Certification

Undergraduate Research Assistant

University of Louisiana, Lafayette, LA | Sept 2021 - May 2023 | NASA EPSCoR, LTRC, Louisiana Board of Regents, Department of Energy, CIMM, and NSF funded

- Assisting in the development of superhydrophobic coatings in compliance with SDS safety requirements
- Proficiently operate tools and machinery such as an air-assisted electrospray, ultrasonic cleaner, tube furnace, and CVD
- Utilized and collected data from SEM, UV-Vis apparatus, and DSA 100 apparatus to visualize coating and measure water contact angles
- Working with a team to solve problems for the improvement of products and communicating the results of research to peers

Hair Stylist and Makeup Artist

Refinery Downtown, Lafayette, LA | February 2018 - May 2023

Bijou Salon and Spa, Scott, LA | February 2016 - February 2018

Hairitage Salon, Galliano, LA | March 2013 - October 2017

- Creating a name and brand for a thriving professional business
- Managing social media platforms for increased customer engagement
- Understanding cosmetics, chemistry, anatomy, and biology for the ability to formulate chemical services specific to the needs and wants of many individuals
- Ability to adhere to a strict time schedule, work under pressure, and maintain excellent time management
- Facilitating the sale of goods and services by applying product and industry knowledge
- Maintaining professional and long lasting relationships with clients, coworkers, and superiors

CERTIFICATIONS

ELA901 SChE® Certificate Program - Chemical Process Safety in the Chemical Process Industries

ELA950 SChE® Certificate Program - The Importance of Process Safety

ELA974 SChE® - Hazards and Risk Introduction to Hazard Identification and Risk Analysis

PUBLICATIONS

Journal Publications

- (1) **Foret, B.**, et al. A Techno-Economic Analysis of Integrating an Urban Biorefinery Process Within a Wastewater Treatment Plant to Produce Sustainable Wood Adhesives. Sustainability 2025, 17, 6679. <https://doi.org/10.3390/su17156679>
- (2) Canepa, J. R., **Foret, B.**, et al. Biogas Upgrading into Renewable Natural Gas: Part I - An Assessment of Available Technologies. Completed Underdraft. (2025).
- (3) **Foret, B.**, Canepa, J. R., et al. Biogas Upgrading into Renewable Natural Gas: Part II - An Assessment of Emerging Technologies. Completed Underdraft. (2025).
- (4) **Foret, B.**, Shrestha, B., et al. A Review of Current and Emerging Technologies for the Sustainable Utilization of Solar Energy in Water Disinfection. Underdraft. (2025).
- (5) Shrestha, B., **Foret, B.**, et al. An Overview of the Potential for Municipal Wastewater Treatment Plants to Be Integrated into Urban Biorefineries for the Production of Sustainable Bio-Based Fuels and Other Chemicals. Curr Pollution Rep 10, 548–564 (2024). <https://doi.org/10.1007/s40726-024-00318-6>
- (6) Goulas J., et al. Effects of Carbon Templates in Tetraethyl Orthosilicate-Derived Superhydrophobic Coatings, Langmuir, 39 (15), 5495-5504, (2023). <https://doi.org/10.1021/acs.langmuir.3c00233>

Conference Publications

- (1) **Foret, B.**, et al., Development and Optimization of Novel Proteins Derived from Wastewater Solids with and without Soy Protein Blending for Production of Green Bioadhesives, American Institute of Chemical Engineers Annual Meeting, Boston, MA. Presentation. (2025)
- (2) Zappi, M. E., et al., Positioning of Municipal Wastewater Treatment Plants As Integrated Biorefineries for Production of Sustainable Chemicals, American Institute of Chemical Engineers Annual Meeting, Boston, MA. Presentation. (2025)
- (3) **Foret, B.**, et al., A Techno-Economic Analysis of an Integrated Biorefinery Process within Wastewater Treatment Plants to Valorize Biosolids as Sustainable Wood Adhesives, Forest Products Society International Conference, Knoxville, TN. Poster. (2024).

PROFESSIONAL AFFILIATIONS

American Institute of Chemical Engineers (AIChE)
Society of Women Engineers
Omega Chi Epsilon, Chemical Engineering Honor Society

PROJECTS

Capstone Project: Computer Aided Process Design August 2022 - May 2023

Ethylene Glycol Production Plant

- Conducted intensive literature search of articles, plant operations, and patents
- Generated market research report
- Utilized Aspen+ software for the design and process simulation of a plant operation producing 350 million pounds per year of monoethylene glycol at a purity of >99.9% by weight
- Incorporated an air separation unit that supplied required oxygen to the process at a purity of >99.4% by weight, and a pressure swing adsorption system that could remove CO₂ while recycling unreacted ethylene
- Applied Aspen Cost Estimator V12 for the plant and equipment sizing, materials, and design for installed equipment cost expenditure
- Completed an economic analysis on the designed ethylene glycol plant operation that produced a 21.1% DCFROR
- Investigated and generated a process hazard analysis to identify potential risks in the process and formulated safeguards and solutions

SKILLS

Hard Skills

- Python
- R
- AspenTech
- Ansys
- JMP
- Microsoft/Google Suite

REFERENCES

(1) William E. Holmes

Director of Process Analytics and Process Chemistry, Energy Institute of Louisiana, 131 Rex Street, Lafayette, LA 70503, (337) 482-2939, william.holmes@louisiana.edu

(2) Ashley Mikolajczyk, Ph.D., P.E.

Instructor, College of Engineering, University of Louisiana at Lafayette, 131 Rex Street, Lafayette, LA, 70503, (337) 482-5765, ashley.mikolajczyk@louisiana.edu

(3) Jerrod Olivier

Senior Consultant and Partner, Precision Engineering Solutions, LLC., 7805 Hwy 90 E, New Iberia, LA, 70560, (337) 364-0080, j.olivier@prec-engr.com

(4) Renee Ezell

Owner, Refinery Downtown, 403B South Buchanan St., Lafayette, LA, 70501, (337) 257-6926, renee@refinerydowntown.com