Curriculum Vitae - DHAN LORD B. FORTELA, Ph.D.

DHAN LORD B. FORTELA, Ph.D.

Assistant Professor

Department of Chemical Engineering

College of Engineering, University of Louisiana at Lafayette

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- Email: dhanlord.fortela@louisiana.edu
- Work Phone: (+1) 337-482-5765
- Department Website: https://chemical.louisiana.edu/
- UL Lafayette Website: https://www.louisiana.edu/

Links:

- Google Scholar webpage: https://scholar.google.com/citations?user=k-Vpe3wAAAAJ&hl=en
- LinkedIn webpage: https://www.linkedin.com/in/dhan-lord-fortela-80189a1b4/
- ORCiD: https://orcid.org/0000-0002-8042-6284
- GitHub: https://github.com/dhanfort

APPOINTMENTS:

Assistant Professor *[8/2024 – Present]*

Department of Chemical Engineering, College of Engineering, University of Louisiana at Lafayette, Louisiana 70504, United States.

[https://chemical.louisiana.edu/]

Instructor *[8/2019 – 7/2024]*

Department of Chemical Engineering, College of Engineering, University of Louisiana at Lafayette, Louisiana 70504, United States.

[https://chemical.louisiana.edu/]

Research Scientist *[8/2016 – 7/2019]*

The Energy Institute of Louisiana & Department of Chemical Engineering, College of Engineering, University of Louisiana at Lafayette, Louisiana 70504, United States.

[https://chemical.louisiana.edu/] [https://energy.louisiana.edu/]

Instructor *[1/2011 – 7/2012]*

Department of Chemical Engineering, University of the Philippines at Los Banos, Laguna, Philippines.

[https://uplb.edu.ph/]

PROFESSIONAL PREPARATION:

Doctor of Philosophy, Chemical Engineering

8/2013 – 8/2016

University of Louisiana at Lafayette, Lafayette, Louisiana, United States

[https://chemical.louisiana.edu/]

MicroMasters in Statistics and Data Science

8/2021 – 12/2023

MITx (Online in edX.org by Massachusetts Institute of Technology), Boston, MA, United States

Valid Certificate ID in edX: e8315d4503cb477aa04e6a34518ad8fb

[https://mitxonline.mit.edu/]

Bachelor of Science, Chemical Engineering

6/2005 – 4/2010

University of the Philippines, Los Baños, Laguna, Philippines

[https://uplb.edu.ph/]

REFEREED PUBLICATIONS (reverse chronological order):

1. Bertrand, R., Dizon, L.S., Holmes, W., **Fortela, D.**, Chistoserdov, A., Hernandez, R., Zappi, M. and Revellame, E. (2025), Design and evaluation of a novel two-phase partitioning bioreactor to enhance methane mass transfer. J Chem Technol Biotechnology. DOI: https://doi.org/10.1002/jctb.70063
2. Foret, B.; Chirdon, W.M.; Hernandez, R.; **Fortela, D.L.B.**; Revellame, E.; Gang, D.; Ben Hmida, J.; Holmes, W.E.; Zappi, M.E. A Techno-Economic Analysis of Integrating an Urban Biorefinery Process Within a Wastewater Treatment Plant to Produce Sustainable Wood Adhesives. *Sustainability* 2025, 17, 6679. DOI: https://doi.org/10.3390/su17156679

3. **Fortela, D.L.B.**; Broussard, H.; Ward, R.; Broussard, C.; Mikolajczyk, A.P.; Bayoumi, M.A.; Zappi, M.E. Soft Actor-Critic Reinforcement Learning Improves Distillation Column Internals Design Optimization. *ChemEngineering* 2025, *9*, 34. DOI: https://doi.org/10.3390/chemengineering9020034

4. **Fortela, D. L. B.**, Mikolajczyk, A. P., Hernandez, R., Revellame, E., Sharp, W., Holmes, W., Gang, D., & Zappi, M. E. Dynamic Time Warping as Elementary Effects Metric for Morris-Based Global Sensitivity Analysis of High-Dimension Dynamical Models. *Mathematical and Computational Applications*, Vol 29 (2024), No. 6, 111. DOI: https://doi.org/10.3390/mca29060111

5. Ashley P. Mikolajczyk, **Dhan Lord B. Fortela**, J. Calvin Berry, William M. Chirdon, Rafael A. Hernandez, Daniel D. Gang, and Mark E. Zappi. Evaluating the Suitability of Linear and Nonlinear Regression Approaches for the Langmuir Adsorption Model as Applied toward Biomass-Based Adsorbents: Testing Residuals and Assessing Model Validity. *Langmuir*, Vol 40 (2024). No. 39, 20428-20442. DOI: https://doi.org/10.1021/acs.langmuir.4c01786

6. B Shrestha, B Foret, W Sharp, D Gang, R Hernandez, E Revellame, **DLB Fortela**, WE Holmes, ME Zappi. 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. *Current Pollution Reports,* Vol 10 (2024), 548–564. DOI: https://doi.org/10.1007/s40726-024-00318-6

7. **DLB Fortela**, AP Mikolajczyk, MR Carnes, W Sharp, E Revellame, R Hernandez, WE Holmes, ME Zappi. Predicting Molecular Docking of Per- and Polyfluoroalkyl Substances to Blood Protein Using Generative Artificial Intelligence Algorithm DiffDock. *Biotechniques,* 7 (2024), DOI: https://doi.org/10.2144/btn-2023-0070

8. ED Revellame, R Aguda, KM Gatdula, W Holmes, **DL Fortela**, W Sharp, D Gang, A Chistoserdov, R Hernandez, ME Zappi. Microalgae in Bioregenerative Life Support Systems for Space Applications. *Algal Research* 77 (2024). https://doi.org/10.1016/j.algal.2023.103332

9. **DLB Fortela**, A Travis, AP Mikolajczyk, W Sharp, ED Revellame, W Holmes, R Hernandez, M Zappi. Quantitating Wastewater Characteristic Parameters Using Neural Network Regression Modeling on Spectral Reflectance. *Clean Technologies,* 5 (2023), 1186-1202. DOI: https://doi.org/10.3390/cleantechnol5040059

10. S Hazra, P Morampudi, JC Prindle, **DLB Fortela**, R Hernandez, ME Zappi, P Buchireddy. Torrefaction of Pine Using a Pilot-Scale Rotary Reactor: Experimentation, Kinetics, and Process Simulation Using Aspen Plus™. *Clean Technologies,* 5 (2023), 675-695. DOI: https://doi.org/10.3390/cleantechnol5020034

11. **DLB Fortela**, AP Mikolajczyk. Detecting Plant-Wide Oscillation Propagation Effects of Disturbances and Faults in a Chemical Process Plant Using Network Topology of Variance Decompositions. *Processes,* 11 (2023), 1747. DOI: https://doi.org/10.3390/pr11061747

12. **DLB Fortela**, AC Fremin, W Sharp, AP Mikolajczyk, E Revellame, W Holmes, R Hernandez, M Zappi. Unsupervised Machine Learning to Detect Impending Anomalies in Testing of Fuel Economy and Emissions of Light-Duty Vehicles. *Clean Technologies*, 5 (2023), 418-435. DOI: https://doi.org/10.3390/cleantechnol5010021

13. **DLB Fortela**, AM DeLattre, WW Sharp, ED Revellame, ME Zappi. Using Self-Organizing Map Algorithm to Reveal Stabilities of Parameter Sensitivity Rankings in Microbial Kinetic Models: A Case for Microalgae. *Clean Technologies*, *5 (*2023), 38-50. DOI: https://doi.org/10.3390/cleantechnol5010003

14. B Shrestha, R Hernandez, **DL Fortela**, W Sharp, A Chistoserdov, D Gang, E Revellame, WE Holmes, ME Zappi. Formulation of a Simulated Wastewater Influent Composition for Use in the Research of Technologies for Managing Wastewaters Generated during Manned Long-term Space Exploration and Other Similar Situations – Literature-based Composition development. *BioTech* 12 (2023), 8. DOI: https://doi.org/10.3390/biotech12010008

15. D Blue, **DL Fortela**, W Holmes, S LeBoeuf, R Subramaniam, R Hernandez, ME Zappi, ED Revellame Alkali Pretreatment of Industrial Mixed Vegetable Waste for Fermentable Sugar Production. *Biomass Conversion and Biorefinery* (2021). DOI: https://doi.org/10.1007/s13399-021-01608-5

16. ED Revellame, R Aguda, A Chistoserdov, **DL Fortela**, RA Hernandez, ME Zappi. Microalgae cultivation for space exploration: Assessing the Potential for a New Generation of Waste to Human Life-support System for Long Duration Space Travel and Planetary Human Habitation. *Algal Research*, 55(2021): 102258. DOI: https://doi.org/10.1016/j.algal.2021.102258

17. **DL Fortela**, M Crawford, A DeLattre, S Kowalski, M Lissard, A Fremin, W Sharp, E Revellame, R Hernandez, M Zappi. Using Self-Organizing Maps to Elucidate Patterns among Variables in Simulated Syngas Combustion. *Clean Technologies, 2* (2020), 156-169. DOI: https://doi.org/10.3390/cleantechnol2020011

18. Q Lian, ZU Ahmad, DD Gang, ME Zappi, **DLB Fortela**, R Hernandez. The effects of carbon disulfide driven functionalization on graphene oxide for enhanced Pb (II) adsorption: Investigation of adsorption mechanism. *Chemosphere* 248 (2020) 126078. DOI: https://doi.org/10.1016/j.chemosphere.2020.126078

19. ED Revellame, **DL Fortela**, W Sharp, R Hernandez, M Zappi. Adsorption kinetic modeling using pseudo-first order and pseudo-second order rate laws: A review. *Cleaner Engineering and Technology*, 1 (2020) 100032. DOI: https://doi.org/10.1016/j.clet.2020.100032

20. B Shrestha, R Hernandez, **DLB Fortela**, W Sharp, A Chistoserdov, D Gang, E Revellame, W Holmes, ME Zappi. A Review of Pretreatment Methods to Enhance Solids Reduction during Anaerobic Digestion of Municipal Wastewater Sludges and the Resulting Digester Performance: Implications to Future Urban Biorefineries. *Applied Sciences*, 10 (2020) 9141. DOI: https://doi.org/10.3390/app10249141

21. **DL Fortela**, W Sharp, E Revellame, W Holmes, R Hernandez, M Zappi. Lipid Accumulation Capability of Typical Non-Acclimated Activated Sludge Microbial Consortia Using Methane Gas as Secondary Carbon Source. *Engineering Reports,* 2 (2020), e12148. DOI: https://doi.org/10.1002/eng2.12148

22. ME Zappi, A Zappi, E Revellame, W Sharp, **DL Fortela**, R Hernandez, T Chambers, Kary Ritter, D Gang. An Assessment of the Potential to Produce Commercially Valuable Plant-based Lipids for Production of Biofuels and Other Sustainable Chemicals on Highway Right-of-Way Land Areas Located within the Southeastern United States. *Sustainability*, 12 (2020), 5225. DOI: https://doi.org/10.3390/su12135225

23. **DL Fortela**, K Farmer, A Zappi, W Sharp, E Revellame, D Gang, M Zappi. A Methodology for Global Sensitivity Analysis of Activated Sludge Models: Case Study with Activated Sludge Model No. 3 (ASM3). *Water Environment Research* (2019). DOI: https://doi.org/10.1002/wer.1127

24. LC Go, **DLB Fortela**, E Revellame, M Zappi, W Chirdon, W Holmes, R Hernandez. Biobased Chemical and Energy Recovered from Waste Microbial Matrices. *Current Opinion in Chemical Engineering,* 26 (2019), 65-71. DOI: https://doi.org/10.1016/j.coche.2019.08.005

25. ME Zappi**,** R Bajpai, R Hernandez, A Mikolajczyk, **DL Fortela**, W Sharp, W Chirdon, K Zappi, D Gang, KDP Nigam, ED Revellame. Microalgae Culturing To Produce Biobased Diesel Fuels: An Overview of the Basics, Challenges, and a Look toward a True Biorefinery Future. *Industrial & Engineering Chemistry Research*, 58 (2019), 15724-15746. DOI:https://doi.org/10.1021/acs.iecr.9b01555

26. **DL Fortela**, R Hernandez, E Revellame, W Holmes, W Sharp, M Zappi. Lipids from Wastewater-Activated Sludge Cultivated on Acetic Acid as Potential Alternatives to High-value Oils and Fats. *Journal of the American Oil Chemists' Society* (2019). DOI: https://doi.org/10.1002/aocs.12225

27. ME Zappi**,** E Revellame, **DL Fortela**, R Hernandez, D Gang, W Holmes, W Sharp, A Mikolajczyk, KDP Nigam, R Bajpai. Evaluation of the Potential to Produce Biogas and Other Energetic Coproducts Using Anaerobic Digestion of Wastewater Generated at Shrimp Processing Operations. *Industrial & Engineering Chemistry Research*, 58 (2019), 15930-15944. DOI: https://doi.org/10.1021/acs.iecr.9b01554

28. ME Zappi, **DL Fortela**, W Sharp, R Bajpai, D Gang, W Holmes, R Hernandez, ED Revellame. Evaluation of the Methane Production Potential of Catfish Processing Wastewater Using Various Anaerobic Digestion Strategies. *Processes,* 7 (2019) 368. DOI: https://doi.org/10.3390/pr7060368

29. D Blue, **DL Fortela**, W Holmes, D LaCour, S LeBoeuf, C Stelly, R Subramaniam, R Hernandez, ME Zappi, ED Revellame. Valorization of Industrial Vegetable Waste Using Dilute HCl Pretreatment. *Processes,* 7 (2019) 853. DOI: https://doi.org/10.3390/pr7110853

30. **DL Fortela**, W Sharp, E Revellame, R Hernandez, D Gang, M Zappi. Computational evaluation for effects of feedstock variations on the sensitivities of biochemical mechanism

parameters in anaerobic digestion kinetic models. *Biochemical Engineering Journal*, 143 (2019) 212-223. DOI: https://doi.org/10.1016/j.bej.2019.01.001

31. **DL Fortela**, AP Mikolajczyk, R Hernandez, E Revellame, W Holmes, M Zappi. Techno-economic Potential of Integrated Anaerobic Digestion and AerobicLipid Accumulation for Fuels and Materials Recovery from Wastewater Treatment Plants. *Journal of Fundamentals of Renewable Energy and Applications*, 8 (2018). URL: https://api.semanticscholar.org/CorpusID:134351047

32. **DL Fortela**, R Hernandez, A Chistoserdov, M Zappi, R Bajpai, D Gang, E Revellame, W Holmes. Biodiesel Profile Stabilization and Microbial Community Selection of Activated Sludge Feeding on Acetic Acid as a Carbon Source. *ACS Sustainable Chemistry & Engineering,* 4 (2016) 6427-6434. DOI: https://doi.org/10.1021/acssuschemeng.6b01140

33. **DL Fortela**, R Hernandez, WT French, M Zappi, E Revellame, W Holmes, A Mondala. Extent of Inhibition and Utilization of Volatile Fatty Acids as Carbon Sources for Activated Sludge Microbial Consortia Dedicated for Biodiesel Production. *Renewable Energy,* 96 (2016) 11-19. DOI: https://doi.org/10.1016/j.renene.2016.04.068

34. **DL Fortela**, R Hernandez, M Zappi, WT French, R Bajpai, A Chistoserdov, Emmanuel Revellame, W Holmes. Microbial Lipid Accumulation Capability of Activated Sludge Feeding on Short Chain Fatty Acids as Carbon Sources through Fed-batch Cultivation. *Journal of Bioprocessing & Biotechniques*, 6 (2016) 275. DOI: https://api.semanticscholar.org/CorpusID:54989874

RESEARCH GRANTS:

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TOTAL Fund of Projects with role of Principal Investigator (PI) = US **$589,552**.

TOTAL Fund of Projects with role of Co-Investigator (Co-I) and PI = US **$1,701,377**.

_____…_____

- Principal Investigator: *Production of Nonanoic Acid and Similar Herbicides via In-situ Ozone Cracking of Microbial Oils Cultivated on Organic Wastewaters*, 2025-2028. Funding Agency: Louisiana Board of Regents (LA-BOR); Sub-program: Industrial Ties Research Subprogram (ITRS). US$ 301,573 (external fund from LA-BOR) + US$ 199,579 (internal fund as Co-share by UL Lafayette plus consultation services by collaborators) = US$ 501,152 total project fund. [https://rsi.laregents.edu/wp-content/uploads/2025/04/RD_ITRS_2025_FINAL.pdf]
- Principal Investigator: *TinyML4Heart: Realtime Early-Detection of Cardiac Arrest Risk Using Machine Learning in Embedded Edge - Computing Device*, 2024-2025. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: 80NSSC20M0110. US$4,500. [https://lanasaepscor.lsu.edu/]

- Principal Investigator: *TinyML4WaterQ: Enabling Mobile Spectrophotometric-based Characterization of Water Quality Using Machine Learning Models Embedded in Light-weight Edge-computing Device*, 2024-2025. Funding Agency: Louisiana Space Grant Consortium (LaSPACE) and Louisiana Sea Grant (LSG). Primary NASA Grant No.: 80NSSC20M0110. US$4,500. [https://lanasaepscor.lsu.edu/] [https://www.laseagrant.org/]
- Principal Investigator: *Enhancing the Machine Learning-based Detection of Long-lasting Continuous Gravitational Waves*, 2023-2024. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: 80NSSC20M0110, Sub-award No.: PO-0000242393. US$6,000. [https://lanasaepscor.lsu.edu/]
- Principal Investigator: *Application of Convolutional Neural Networks in Disentangling Exoplanet Atmospheric Chemical Composition Spectra Measured by the James Webb Space Telescope*, 2022-2023. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: 80NSSC20M0110, Sub-award No.: PO-0000206339. US$4,700. [https://lanasaepscor.lsu.edu/]
- Principal Investigator: *CHEE 413 Redefined: Enhancing Open-source Hardware, Software, Teaching, and Research-driven Materials for the Chemical Engineering Process Control Course*, 2022-2023. UL Lafayette ADVANCE Course Improvement Grant. UL Lafayette Grant through the Student Center for Research Creativity and Scholarship (SCRCS), UL Lafayette. US$3,000.
- Co-Investigator: *Enhancing the Carbon Dioxide Sequestering Capacity of Louisiana Highway Right of Way Lands*, 2021-2022. Funding Agency: Louisiana Department of Transportation and Development. LTRC Project Number: 22-3TIRE. US$29,977. [https://www.ltrc.lsu.edu/]
- Principal Investigator: *Machine Learning Analysis of Gene Transcriptions of Cancer Cells in Spaceflight Microgravity*, 2021-2022. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: 80NSSC20M0110, Sub-award No.: PO-0000168186. US$4,700. [https://lanasaepscor.lsu.edu/]
- Principal Investigator: *Applying Deep Learning for Prediction of Shoreline Dynamics in Coastal Louisiana*, 2021-2022. Funding Agency: Louisiana Space Grant Consortium (LaSPACE) and Louisiana Sea Grant. Primary NOAA Grant No.: NA18OAR4170098, Sub-award No.: PO-0000064084. US$4,000. [https://lanasaepscor.lsu.edu/] [https://www.laseagrant.org/]
- Principal Investigator: *Making NASA's Open-Innovation Data More Machine-Learning Friendly: A Case for the MAVEN Dataset*, 2020-2021. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: 80NSSC20M0110, Sub-award No.: PO-0000139276. US$6,000. [https://lanasaepscor.lsu.edu/]
- Principal Investigator: *Investigating the Effects of Various Feeds on Reproductive Performance of Captive Breeding Alligators*, Project Period: 1 August 2020 – 31 July 2021. Sponsor: Golden Ranch Farms LLC, Louisiana, USA. UL Lafayette Grant No. 379366. US$45,000. [https://goldenranch.com/]

- Principal Investigator. *Integrating mathematical Models of Bioprocesses for the NASA-BIOSYS Project*, 2019-2020. Funding Agency: Louisiana Space Grant Consortium (LaSPACE). Primary NASA Grant No.: NNX15AH82H, Sub-award No.: PO-0000105697. US$6,000. [https://lanasaepscor.lsu.edu/]
- Co-Investigator. *Microbial Conversion of Methane-Based Gases, Such as Natural Gas and Biogas, into Commercially Valuable Lipids*, 2018-2019. Funding Agency: Louisiana Board of Regents – ITRS Subprogram. US$203,0a00. [https://www.laregents.edu/]
- Co-Investigator. *Production of Fuels and Other Life Support Products Using Wastewaters as a Feed into a Space-Based Biochemical Conversion System (BIOSYS)*, 2018-2022. Funding Agency: Louisiana Board of Regents and Louisiana NASA-EPSCoR. NASA Cooperative Agreement Number 80NSSC18M0062 (CFDA #43.008). US$1,380,000. [https://lanasaepscor.lsu.edu/]

BOOK/BOOK CHAPTER:

A Mondala, R Hernandez, T French, E Revellame, **DL Fortela**, M Amirsadeghi, B Hartenbower. Bioenergy from Activated Sludge and Wastewater. In *Green Chemistry for Sustainable Biofuel Production*, Ed. VG Gude, (2017) ISBN 9781771886390, Apple Academic Press.

SUBMITTED/ IN PREPARATION/ NON-REFEREED PUBLICATIONS:

- **Fortela, D. L.**; Broussard, H.; Ward, R.; Broussard, C.; Mikolajczyk, A.; Bayoumi, M.; Zappi, M. Soft Actor-Critic Reinforcement Learning Improves Distillation Column Internals Design Optimization. Preprints 2025, 2025011596. https://doi.org/10.20944/preprints202501.1596.v1
- **DL Fortela**, A Mikolajczyk. Schrödinger's Cat May Be Dead All Along. *Preprints* (2023), 2023100009. DOI: https://doi.org/10.20944/preprints202310.0009.v2
- **DL Fortela**, A Travis, A Mikolajczyk, W Sharp. Exoplanet Atmosphere Characterization via Transit Spectra Classification. *Preprints* (2023), 2023081385. DOI: https://doi.org/10.20944/preprints202308.1385.v1
- **DL Fortela**, A DeLattre, S Kowalski, W Sharp, E Revellame, R Hernandez, D Gang, R Sharp, M Zappi. A Global Sensitivity Analysis Methodology for Anaerobic Digestion Models through Functional Principal Components Projection. *Authorea Preprints* (2020). DOI: https://doi.org/10.22541/au.158221321.19687750

PATENTS:

- "Biorefinery Method and System for Isolated Environments". Application Number: 15/828,809. US Patent Office Publication No. US10947144B2. Inventors: Mark E. Zappi, Daniel Gang, Emmanuel Revellame, Andrei Chistoserdov, Rafael Hernandez, Rakesh Bajpai, Wayne Sharp, **Dhan Lord B. Fortela**.
  URL: https://patents.google.com/patent/US10947144B2/en
- "Infrared-based Gas Flowmeter". Application Number: 16/168,059. US Patent Office Publication No. US20190128717A1. Inventors: **Dhan Lord B. Fortela**, Kyle S. Farmer, Nicholas S. Marcil, Wayne W. Sharp.
  URL: https://patents.google.com/patent/US20190128717A1/en

AWARDS/HONORS:

- UL Lafayette Outstanding Undergraduate Research Mentor Award, For Academic Year 2023-2024 by University of Louisiana at Lafayette; Research Recognition Ceremony on March 14, 2025.

TEACHING EXPERIENCE:

Instructor, University of Louisiana at Lafayette, Lafayette, LA, USA

Courses Taught for Fall Semesters: Fall 2019, Fall 2020, Fall 2021, Fall 2022, Fall 2023

- CHEE 420 - Chemical Reaction Engineering
- CHEE 403 - Chemical Engineering Laboratory I
- CHEE 401 - Stage Operations Design
- CHEE 310 - Chemical Engineering Thermodynamics
- CHEE 101 - Introduction to Chemical Engineering

Courses Taught for Spring Semesters: Spring 2020, Spring 2021, Spring 2022, Spring 2023, Spring 2024

- CHEE 620 - Advanced Reactor Design (Graduate Course)
- CHEE 404 - Chemical Engineering Laboratory II
- CHEE 310 - Chemical Engineering Thermodynamics
- CHEE 413 - Process Control in Chemical Engineering

Course Creation: CHEE 426 - Machine Learning for Chemical Engineers (Starting Spring 2024)

Instructor: Department of Chemical Engineering, University of the Philippines

Los Baños, Laguna, Philippines 2011 – 2012

Courses Taught:

- ChE 147 - Chemical Engineering Fluid Dynamics (Spring 2011)
- ChE 152 - Separation Processes/Stage Operations Design (Spring 2011)
- ChE 156 - Unit Operations Laboratory II (Spring 2011)
- ChE 145 - Chemical Reaction Engineering (Fall 2011)
- ChE 155 - Unit Operations Laboratory I (Fall 2011)
- ChE 172 - Biochemical Engineering (Spring 2012)
- ChE 156 - Unit Operations Laboratory II (Spring 2012)
- ChE 155 - Unit Operations Laboratory I (Fall 2012: *June & July 2012)*

Chemical Engineering Board Licensure Exam Reviewer, Philippine Institute of Chemical Engineers (PIChE) – Laguna Chapter

- Developed board licensure exam review materials for chemical reaction engineering, distillation, liquid-liquid extraction, gas-stripping, solids handling, and physical chemistry.
- Formulated questions and solutions for review sessions and for pre-board (simulated) examinations.

STUDENT MENTORING:

Department of Chemical Engineering, University of Louisiana, Lafayette, LA, USA

Undergraduate Student Research Mentoring (Fall 2013-Present):

- Renee Ward: Machine Learning with Python, TinyML: Embedded-ML Device (2024-2025)
- Carly Broussard: Machine Learning with Python,TinyML: Embedded-ML Device (2024-2025)
- Lorin Bernard: Machine Learning with Python (2023-2024)
- Armani Travis: Machine Learning with Python (2022-2023)
- Miranda Carnes: Machine Learning with Python (2021-2022)
- Kevin Toups: GIS, Machine Learning with Python (2021-2022)

- Ashton Fremin: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs, Gas Instrumentation, Machine Learning (2020-2021)
- Alyssa DeLattre: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs, Gas Instrumentation, Computational Modelling (2019-2020)
- Kyle Farmer: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs, Gas Instrumentation, GIS
- Nicholas Marcil: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs, Gas Instrumentation, GIS
- Terrence Hicks: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs
- Bimi Shrestha: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Bioreactor Setup & Runs, Catalyst Preparation, Corrosion Testing, Presentation Techniques
- Liew Go: Analytical Techniques (Liquid Chromatography, Wastewater Analyses), Corrosion Testing
- Arafat Noor: Analytical Techniques (Liquid Chromatography, Wastewater Analyses)

Graduate Student Research Mentoring:

- Gopi Chand Tripuraneni (MS Student): Analytical Techniques (Solvent Extraction, Wastewater Analyses), Bioreactor Setup & Runs, Experimental Designs, Data Analyses

Dave C. Swalm School of Chemical Engineering, Mississippi State University, MS, USA

Undergraduate Student Research Mentoring (Fall 2012-Spring 2013):

- Efreme Egede: Chemical Lab Solvent Extraction, Analytical Procedures

Department of Chemical Engineering, University of the Philippines, Los Baños, Laguna, Philippines

As Committee Chair of Undergraduate Student Thesis:

- Felix Rey C. Bueta [Completed: April 2012] Design, fabrication and preliminary testing of a pilot-scale continuous dye adsorption column for color reduction of a simulated textile wastewater using granular activated carbon adsorbent from coconut shell.
- Jonathan David M. Maligalig [Completed: April 2012] Solidification and stabilization of waste copper slags from sandblasting procedures.

As Committee Member of Undergraduate Student Thesis:

- Jenefer S. Bernat [Completed: April 2012] Bioethanol production of sweet sorghum syrup in flask and bioreactor fermentations using high-ethanol producing BIOTECH yeast strains.
- Christian M. Gupit [Completed: April 2012] Application of repeated batch fermentation process with cell recycle for the molasses-based ethanol fermentation of a promising local BIOTECH yeast strain.
- Luis Felipe D. Lopez [Completed: April 2012] Optimization of steam explosion parameters in the pretreatment of sweet sorghum bagasse for bioethanol production.
- Clarice Meryl M. Ocampo [April 2012] Ethanol fermentation of cassava starch hydrolyzates using BIOTECH yeast strains in flask and bioreactor systems.
- Mark Lester R. Ocampo [Completed: April 2012] Production of single-cell protein (SCP) from yeast *Candida sp.* grown in cassava starch hydrolyzates.
- Christian Anne U. Enciso [Completed: May 2012] Application of coagulation-flocculation treatment on a local meat processing wastewater using tahong (*Perna viridis*) shells.
- Arvin L. Valderrama [Completed: April 2011] Combined sonolytic and TiO_2-based photocatalytic treatment of reactive Red 120 azo dye in simulated wastewater: An evaluation of decolorization performance and synergy.

SERVICE:

- Chapter Chief Advisor, 2022-Present: Tau Beta Pi, The Engineering Honor Society, Louisiana Delta Chapter, University of Louisiana at Lafayette.
- Mentor, 2016-Present: UL Lafayette College of Engineering's Undergraduate Research Apprentice Program (URAP), University of Louisiana at Lafayette.
- Civic Outreach/Volunteer: '*Ugnayan ng Pahinungod' – The Volunteer Service Program of the University of the Philippines*

Faculty Volunteer: 2011-2012 (2 semesters)

- Supervision and facilitation of field immersion classes of undergraduate students conducting literacy service and civic welfare service *(2 Sections)*
- Faculty-in-chare for training classes of undergraduate students taking preparatory modules for field immersions on literacy service and civic welfare service
- Preparation and implementation of college entrance exam review modules for underprivileged high school senior students

Student Volunteer: 2009-2010 (4 semesters)

- Student assistant facilitator for training classes of undergraduate students taking preparatory modules for field immersions on literacy service and civic welfare service *(4 Sections)*
- Facilitation of team building activities for undergraduate student organizations
- Implementation of literacy training modules for underprivileged primary school students

OTHER SYNERGISTIC ACTIVITIES:

- Professional Memberships: American Institute of Chemical Engineers (AIChE); American Oil Chemists' Society (AOCS); Philippine Institute of Chemical Engineers (PIChE)
- Honor Society Membership: The Honor Society of Phi Kappa Phi (Initiated: April 6, 2010); Tau Beta Pi – The Engineering Honor Society (Initiated: November 11, 2022).
- Journal Reviewer for:

o Big Data Research (Elsevier)

o Separation and Purification Technology (Elsevier)

o Water Environment Research (Wiley)

o Water Research journal (Elsevier)

o Chemical Engineering & Processing – Process Intensification journal (Elsevier)

o Advances in Robotics and Automation journal (MDPI)

o Journal of Remote Sensing and GIS (MDPI)

o Journal of Bioprocessing and Biotechniques

o Journal of Civil and Environmental Engineering (MDPI)

o Mathematical and Computer Modelling of Dynamical Systems (Taylor & Francis)

o Plants (MDPI)

o Fermentation (MDPI)

o Sustainability (MDPI)

o Energies (MDPI)

o Processes (MDPI)

o Environmental Science and Pollution Research/ESPR (Springer)

- Topical Advisory Panel Member (2021-Present): *Clean Technologies* journal MDPI (**ISSN: 2571-8797**)
- Topical Advisory Panel Member (2023-Present): *ChemEngineering* journal MDPI (**ISSN: 2305-7084**)

- Conference Proceedings and Presentations

  (*Presenting Author)

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o **DL Fortela***, R Hernandez, M Zappi, A Chistoserdov, R Bajpai, E Revellame, W Holmes. The Dynamics of Biodiesel Profile and Fungal Diversity of Activated Sludge during Lipid Accumulation on Acetic. *Presented at the 2016 AIChE Annual Meeting. San Francisco, CA, USA*. November 14, 2016. [Oral]

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