LIEUTENANT COLONEL TREVOR J. CORRIGAN

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Education

Master of Science, Chemical Engineering, University of Washington, Seattle, WA, 2018

Bachelor of Science, Chemical Engineering, United States Military Academy, West Point, NY, 2008

Academic Experience

Assistant Professor, Department of Chemistry and Life Science, United States Military Academy, West Point, New York 10996, 2020.

Instructor, Department of Chemistry and Life Science, United States Military Academy, West Point, New York, 10996, 2018.

Army Advanced Civil Schooling Graduate Fellow, U.S. Army Student Detachment with duty at the University of Washington, Seattle, WA, 98195, 2016-2018.

West Point Academy Professor Fellow, U.S. Army Student Detachment with duty at the University of Washington, Seattle, WA, 98195, 2024-2027.

Military, Command, and Operational Experience

Operations Officer, INDOPACOM Nuclear Operations Command Center, Camp Smith, HI 96861, 2021-2024.

Instructor/Assistant Professor, Department of Chemistry and Life Science, United States Military Academy, West Point, New York 10996, 2018-2021.

Company Commander, A/2-35 Infantry Battalion, 140-person Light Infantry Rifle Company, 2015-2016.

Company Commander, HHC/2-35IN/3IBCT 25th Infantry Division, 225-person Light Infantry Headquarters Company, 2014-2015.

Operation Enduring Freedom. Ranger Company Executive Officer and Ground Force Commander, two deployments in support of Combined Joint special Operations Task Force, Afghanistan, 2012-2013.

Operation Enduring Freedom. Ranger Platoon Leader and Night Battle Captain, two deployments in support of Combined Joint Special Operations Task Force, Afghanistan, 2010-2011.

Operation Iraqi Freedom. Stryker Platoon Leader, Muqdidiyah, Iraq, 2009-2010.

Certifications

U.S. Army Space Cadre Basic Course, 2024.

Nuclear Weapons Effects, Policy, and Proliferation, Air Force Institute of Technology, 2021.

Master Teacher Certificate, United States Military Academy Master Teacher Program, 2018.

Fundamentals of Engineering Exam, Delaware, Application #1681

Military Education and Professional Development

NORAD/NORTHCOM Strike Advisor and Conference Manager Course, 2022

Theater Nuclear Operations Course, 2022

Nuclear & WMD Counter Proliferations Officer Qualification Course, 2022

Academy Professor Search Candidate, 2021

Nuclear Weapons Effects Program (AFIT), 25 March 2021

Intermediate Level Education (CGSC), Distance Learning, 2020

25th ID Company Commander & 1SG Pre-Command Course, Schofield Barracks, HI, 2014

Maneuver Captains Career Course (Commandant's List), Fort Benning, GA, 2014

U.S. Army Jump Master Course, Joint Base Lewis McChord, 2013

Ranger Assessment and Selection Program II, Fort Benning, GA, 2010

U.S. Army Ranger School (Honor Graduate), Fort Benning, GA, 2009

U.S. Army Infantry Officer Basic Course, Fort Benning, GA, 2008 U.S.

Army Basic Officer Leadership Course, Fort Benning, GA, 2008.

U.S. Army Airborne School, Fort Benning, GA, 2006.

Courses Taught and Developed

General Chemistry I and II, CH101 and CH102. Introduces students to inorganic and organic chemical reactions and nomenclature, chemical thermodynamics, equilibrium chemistry, chemical kinetics, biochemistry, and military chemistry. Instructor for 2 sections of CH102 in the Fall of 2020, assistant course director and instructor for 2 sections of CH102 in the Fall of 2019. Instructor for 4 sections of CH102 in the Spring of 2019. Instructor for 4 sections of CH101 in the Fall of 2018.

Mass and Energy Balances, CH362. An advanced chemical engineering elective in which cadets learn to solve systems of linear algebraic equations that describe balances around various chemical engineering equipment or chemical plants. Sole instructor and course director in the Spring of 2020 and Spring of 2021.

Separation Processes CH363. Covers commonly used industrial separation techniques, such as distillation, extraction, absorption, and membrane processes. A significant amount of chemical thermodynamics is covered to develop a foundation for understanding separation processes that involve phase creation or addition. Developed and taught lessons on thermodynamics and transport phenomena in the Fall of 2020.

Bioprocess Engineering CH350. This course provides a broad understanding of the field of bioprocess engineering. Topics covered include enzymes and enzyme kinetics, cell growth and cell growth kinetics, suspension and immobilization of cultures, bioreactor design, scale-up, control, and recovery and purification technology. Developed course curriculum and lead the stand up of this course.

Bioengineering Modeling and Analysis CH450. This course provides a broad understanding of bioengineering disciplines to include biomechanics, biomaterials, tissue engineering, biocatalysis, biochemical engineering, and biosensors. Developed and taught a lesson on biochemical engineering as a guest lecturer.

Introduction to Research I and II, CH289 and CH290, Designed and implemented an introductory research course (CH289) in AY19-2 that introduced fourth class cadets to the scientific method.

Beginning with initial background literature reviews, through experimental design, exploring safety and controls, execution, analysis, and presentation. Expressing, purifying and quantifying a target protein in a prokaryotic host. Instructor and Research Adviser for 4 cadets in the Fall 2018 and 2019 and the Spring of 2019 and 2020. The results of the course were presented at the 2019 AIChE Annual Meeting in Orlando, FL November 11, 2019.

Advance Lab Projects I and II, CH389 and CH390. These are independent study research courses, in which cadets work on a research topic under the guidance of a faculty member. Instructor and research adviser for 2 cadets in the Spring 2020, the Fall 2020 and Spring 2021.

Individual Research I CH489. This undergraduate research course is designed to significantly advance the cadet's knowledge and comprehension of science and/or engineering by answering a real-world scientific question. Instructor and Research advisor for 3 cadets in the Spring of 2021.

Peer-Reviewed Publications

* Designates Corresponding Author; ** Designates Cadet Co-authors

"Changes in the Physical and Mechanical Properties of Human Blood with Sustained Prophylactic Use of Acetylsalicylic Acid (Aspirin)—A Rheological Study," Trevor Corrigan*, Liam O'Malley**, Dorian Bailey**, Hope Moseley**, Jada Okaikoi**, Thomas Brown**, Sean Murray**, William Chang**, Minseo Yang**, Lam Nguyen, Erin Milner, Kevin O'Donovan, Matthew Armstrong, Open Journal of Fluid Dynamics (2021), 11, 167-176. https://doi.org/10.4236/ojfd.2021.114010.

"Probing microstructural differences that manifest in human blood after taking aspirin using thixoelasto-visco-plastic modeling and series of physical processes," Matthew Armstrong, Erin Milner, Dorian Bailey, Andre Pincot, Thomas Brown, Lam Nguyen, Kevin O'Donovan, Chi Nguyen, Trevor Corrigan, AIP Advances (2021), 11, 115226. https://doi.org/10.1063/5.0074608

"Framework for Analyzing Placement of and Identifying Opportunities for Improving Technical Communication in a Chemical Engineering Curriculum," Andrew Pfluger, Matthew Armstrong, Andrew Biaglow, Trevor Corrigan, Enoch Nagelli, Corey James, and April Miller, Education for Chemical Engineers (2020) https://doi.org/10.1016/j.ece.2020.02.001.

"Success in Chemical Engineering at USMA as Predicted by CEER Score," Trevor Corrigan*, Andrew Pfluger, Bryan Jonas, April Miller, Daniel Bahaghighat, Eric Mowles, Geoffrey Bull, Corey James, Enoch Nagelli, Melissa Eslinger, Matthew Armstrong, Russell Lachance, Andrew Biaglow, in Teaching and Learning the West Point Way, eds. Morten Ender et al., London, UK: Routledge, 2021 ISBN 9780367685867.

"Chemical Engineering Lab: Getting Results," Matthew Armstrong, Andrew Pfluger, April Miller, Geoffrey Bull, Corey James, Enoch Nagelli, Trevor Corrigan, Andrew Biaglow, in Teaching and Learning the West Point Way, eds. Morten Ender et al., London, UK: Routledge, 2021 ISBN 9780367685867.

"A simple approach for adding thixotropy to an elasto-visco-plastic rheological model to facilitate structural interrogation of human blood," Matthew Armstrong, Mathias Scully**, Michael Clark**, Trevor Corrigan, Corey James, Journal of Non-Newtonian Fluid Mechanics, Vol. 290, April 2021; https://doi.org/10.1016/j.jnnfm.2021.104503.

"Structure-Rheology Elucidation of Human Blood via SPP Framework and TEVP Modeling," Matthew Armstrong, Jeff Baker, Jesse Trump, Erin Milner, J. Kenneth Wickiser, Kenneth Cameron, Nick Clark,

Kaitlyn Schwarting**, Thomas Brown**, Dorian Bailey**, Corey James, Chi Nguyen, and Trevor Corrigan. Korea-Australia Rheology Journal, February 27, 2021; https://doi.org/10.1007/s13367-0210005-1.

"Importance of Viscoelasticity in the Thixotropic Behavior of Human Blood" Matthew Armstrong, Katelyn Rook**, Wes Pulles**, Michael Deegan**, and Trevor Corrigan. Rheologica Acta, February 8, 2021; https://doi.org/10.1007/s00397-020-01256-y.

"Visualizing and Exploring Nonlinear Behavior, Timescales, and Mechanical Signatures of Human Blood," Matthew Armstrong, Trevor Corrigan, Erin Milner, Chi Nguyen, and YF Lee submitted to Biorheology, April 8, 2021; DOI: 10.3233/BIR-201007.

"Fusion Products Comprising Mixed Charge Peptides," Patrick McMullen, Erik Liu, Trevor Corrigan, Caroline Tsao, Sijin Luozhong, and Shaoyi Jiang, in preparation.

"Effects of Sustained Low-Dosage Aspirin Consumption on the Thixotropic Behavior, Microstructure and Rheology of Human Blood," Trevor Corrigan*, Thomas Brown**, Kaitlyn Schwarting**, Dorian Bailey**, Liam O'malley**, Joshua Schirner**, Thomas Batt**, and Matthew Armstrong, in preparation.

"Kinetics of Alkaline Hydrolysis of Ethyl Acetate. I. Second-Order Initial Rate Constant for Reaction with Sodium Hydroxide," Jeff Chin, Caspar Yi, Trevor Corrigan, Samuel Cowart, Enoch Nagelli, Matthew Armstrong, and Andrew Biaglow, in preparation.

"Hunt for a Genetically Engineered, Rationally Designed, Stealth Peptide to Prevent Non- Specific Protein Interactions," Trevor Corrigan, University of Washington, Seattle, WA. May 2016. Research Advisor: Dr. Shaoyi Jiang, Master's Thesis, http://hdl.handle.net/1773/42232.

Patents

Caroline Tsao; Sijin Luozhong, Trevor Corrigan, Shaoyi Jiang, Eric Liu, and Patrick McMullen, "Fusion Products and Bioconjugates Containing Mixed Charge Peptides", Patent Cooperation Treaty International Application, WO 2020077136 A1 Apr 16, 2020. https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2020077136&tab=PCTBIBLIO&_cid=P22-KF748L-15869-1 Other Publications

"A Practical Guide to Command Supply Discipline for Company Leadership Teams," Trevor Corrigan*, submitted to The Center for Junior Officers for publication on The Junior Officer Blog, November 4, 2020. https://juniorofficer.army.mil/csdp-for-leadership-guide/

"Morality in Combat – A Ranger Story," Trevor Corrigan*. In preparation.

"Content Delivery in the Chemistry Classroom Based on Differences in Pedagogical Training," Daniel DeNeve, Trevor Corrigan, Eric Mowles. Master Teacher Program Graduation Proceedings Center for Faculty Excellence, United States Military Academy, West Point, NY, May 12, 2020.

Abstracts & Conference Proceedings

"Characterization of Human Blood with Sequence of Physical Phenomena and Thixo-Elasto-Visco-Plastic Modeling," Matthew Armstrong, Mathias Scully**, Michael Clark**, Trevor Corrigan, Corey James, 2020 Virtual (AIChE) Meeting. November 2020. (Oral) Accepted Presentation. https://youtu.be/g2fIYI3R0tw

"Predicting Success in Undergraduate Chemical Engineering at the United States Military Academy," Trevor Corrigan*, Andrew Pfluger, Bryan Jonas, April Miller, Daniel Bahaghighat, Eric Mowles, Geoffrey Bull, Corey James, Enoch Nagelli, Melissa Eslinger, Matthew Armstrong, Russell Lachance, Andrew Biaglow. 2019 (AIChE) Annual Meeting, Chemical Engineering Education Poster Session. Orlando, FL, November 12, 2019. (Poster)

"Introduction to Research through Protein Expression and Genetic Engineering of a Zwitterionic Amino Acid Fusion Protein," Thomas Brown**, Kaitlyn Schwarting**, Dorian Bailey**, Trevor Corrigan. 2019 AIChE Annual Meeting, Undergraduate Student Poster Session: Food, Pharmaceutical, and Biotechnology. Orlando, FL, November 11, 2019. (Poster)

"Introduction to Research through Protein Expression in a Prokaryotic Host," Thomas Brown**, Dorian Bailey**, Kaitlyn Schwarting**, Trevor Corrigan., Inter Academy Chemistry Symposium, West
Point April 25, 2019. (Poster)

"Expressing Organophosphate Hydrolase, a Nerve Agent Bio-Scavenger, in E. coli," Thomas Brown**,
Dorian Bailey**, Kaitlyn Schwarting**, Trevor Corrigan. Projects Day, United States Military Academy, West Point May 2, 2019. (Poster)

Projects and Students Mentored at the United States Military Academy

"Protein Expression and Purification in a Prokaryotic Host," Cadets Dorian Bailey, Thomas Brown, Kaitlyn Schwarting, and Jacob Shetter, 2019.

"Effects of Aspirin on the Rheological Properties of Human Blood," Cadets Dorian Bailey, Liam O'malley, Emily Dinallo, and Thomas Brown, 2020.

Technical Skills

Protein Expression and Optimization
Prokaryotic Hosts and relevant quantitative and qualitative assays

Protein Purification
Fast Protein Liquid Chromatography (FPLC) both affinity and size exclusion; selective precipitation

Cloning
Polymerase Chain Reaction (PCR), codon optimization specifically focused on creating fusion proteins

Biomolecular Interfaces and Biomaterials
Preventing non-specific protein interactions (fouling) through modifications to surface chemistry by chemical conjugation of non-fouling agents or fusion through genetic engineering of non-fouling peptides.

Relevant Software: Excel, Mathematica, and CHEMCAD

Cadet Development

Leader Challenge mentor for cadet companies F3, F4, and E1, 2018-present.

Provided an invited talk to cadet company B1 in September 2020 entitled "Morality in Combat." Cadets from B1 asked me to speak to their company and one other company about the importance of morality in combat based off a specific incident that occurred in Charkh District, Logar Province Afghanistan during the summer fighting season of 2011.

Provided an invited talk to the ROTC cadets at the College of William and Mary on Command Supply Discipline. Spring 2021.

Department Academic Counselor (DAC) for 7 cadets, 2019-present. CDT Dorian Bailey (2022), CDT Mackenzie Curtin (2022), CDT Jordan Davis (2022), CDT Kailah Habib (2022), CDT Hope Moseley (2022), CDT Paul Rocha (2022), and CDT Cameron Thompson (2022)

3 cadet/student co-authors for conference presentations, 2019-present. CDT Dorian Bailey (2022), CDT Thomas Brown (2022), and CDT Kaitlyn Schwarting (2022).

Mentored and co-mentored CDT Liam O'Malley, CDT Hope Mosely, CDT Thomas Brown, CDT Dorian Bailey, CDT Kaitlyn Schwarting, and CDT Jacob Shetter in research courses CH289 (4), CH290 (3), CH389 (1), CH390 (2), CH489 (3), 2019- present.

Special Leader Development Mentor for CDT Luke Ensing (2021), CDT Kaitlyn Schwarting (2022), and CDT Oscar Lozada (2022), 2018-present.

Leadership Counseling Mentor in PL300 for Cadets Shane Sulley, Jack Eames, Holden Quinn, Kaitlyn Schwarting, John Elischer, Michael Peters, Nabuchi Buhendwa, Garrett Brown, Peter Kim, Michael Hall, Duncan Day, Liam O'malley, Richard Russel, Emily Dinallo, Patrick Hachmeister, Joe Waddington, Joshua Barbella, Peyton Visconti, Joshua Schirner, David Jung, Daniel Kim, Margaret Oriani, Matthew Simmons, Taylor Vessel, Beau Kewley, Nathan Schubring, David Hazelton, Luke Ensing, and Arnold Hunter, 2019-present.

Platoon Mentor for Cadet Leader Development Training, 2019.

Faculty Development

Faculty Mentor for CPT Caspar Yi and CPT Lam Nguyen, Department of Chemistry and Life Science Faculty Development Workshop, 2019-present.

Collaborated with LTC Eric Mowles and CPT(P) Daniel DeNeve on a research project to analyze best teaching practices in the department with the goal of implementing them into future Faculty Development Workshops. Results published in Master Teacher Graduation proceedings, 2019-2020.

Research collaboration with 9 faculty members: COL Chi Nguyen and Dr. Kamil Woronowicz, CPT Lam Nguyen, MAJ Bryan Jonas (Math Department), LtCol Eric Mowles, LTC Matthew Armstrong, LTC Andrew Pfluger, COL Geoffrey Bull, and Dr. Andrew Biaglow, resulting in the peer-reviewed publications as listed above and the research funding listed below, 2018-present.

Service

Department Supply Officer (S4) and Billing Official responsible for an annual budget of ~$2 million, Department of Chemistry & Life Science, United States Military Academy, West Point, 2018-present.

Fourth Class Sponsor for 23 cadets, 2018-2020.

American Institute of Chemical Engineers Student Chapter Officer Representative and Officer-in-Charge (OIC), 2018-present.

Grants and Funding

"Bionanocomposites for Rapid Electrochemical Detection of Organophosphates," Defense Threat Reduction Agency Service Academy Research Initiative, Department of Chemistry and Life Science, COL Chi Nguyen (PI), MAJ Trevor Corrigan, Dr. Kamil Woronowicz, $10,000, 2018-2019.

"Increased Circulation Time of the Bio-Scavenger Organophosphate Hydrolase," Faculty Development Research Fund (FDRF), MAJ Trevor Corrigan (PI), CDT Thomas Brown, CDT Dorian Bailey, CDT Kaitlyn Schwarting, $2,800, 2018-2019.

"Creating a User-Friendly Heat Category Device for West Point Training Areas," Faculty Development Research Fund (FRF), COL Geoffrey Bull (PI) & MAJ Trevor Corrigan $2,500, 2018-2019.

Professional Affiliations

United States Parachute Association (D-licensed, static line instructor, stadium certified), 2005-present.

National Infantry Association, 2008-present.

American Institute of Chemical Engineers (AIChE), 2006-present.

Awards and Honors

Military Awards, Decorations, and Badges:

Joint Service Commendation Medal, Led the USINDOPACOM Nuclear Procedures Inspection, 2023

Nominee for General Douglas MacArthur Leadership Award by 2-35 Infantry Battalion, 2016.

Meritorious Service Medal (1xOLC), two successful company commands, 2016 & 2021

Commandant's List, Maneuver Captains Career Course, 2014

Bronze Star Medal, Operation Enduring Freedom, 2012

Bronze Star Medal, Operation Iraqi Freedom, 2010

Tex Turner Officer Honor Graduate Award, U.S. Army Ranger School, 2009

Combat Infantryman's Badge (2010)

Parachutist Badge (2006)

Ranger Tab (2009)

Expert Infantryman's Badge (2012)

German Proficiency Badge (GOLD) (2005)

Other Individual Awards:

Army Commendation Medal (2xOLC) (2010, 2013, and 2021)

Army Achievement Medal (2013)

National Defense Service Medal (2008)

Global War on Terror Service Medal (2008)

Iraq Campaign Medal (1xOCL) (2010)

Afghanistan Campaign Medal (1xOCL) (2011)

Army Service Ribbon (2008)

Overseas Service Ribbon (5) (2010, 2011, 2011, 2012, and 2013)

NATO Medal (2012) Unit

Awards:

Valorous Unit Award (2011) for extraordinary heroism while engaged in military operations during the period of 23 August 2011 to 15 December 2011.