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EDUCATION

Dec 2006	Ph.D., **University of Washington**, Computational Physical Chemistry
	Advisor: Prof. Oleg Prezhdo
	Thesis: "Non-adiabatic molecular dynamics in time-dependent density functional theory with applications to nanoscale materials."
	Additional coursework: 9 credits in science writing
Jun 2001	B.S., **University of Colorado, Denver**, Applied Math; Minor: Chemistry

ACADEMIC APPOINTMENTS

Sept 2022 – Present	**Teaching Professor**, University of Washington, Department of Chemistry
Sept 2016 – Sept 2022	**Senior Lecturer/Associate Teaching Professor***, University of Washington, Department of Chemistry
Sept 2012 – Sept 2016	**Lecturer**, University of Washington, Department of Chemistry
Jun 2009 – Sept 2012	**Temporary Lecturer**, University of Washington, Department of Chemistry
Jan – Mar 2012	**Temporary Lecturer**, University of Washington Tacoma, Department of Interdisciplinary Arts and Sciences
Jan 2008 – Mar 2011	**Adjunct Lecturer**, Seattle Central Community College [now Seattle Central College], Division of Science and Math
Mar – Jun 2010	**Temporary Lecturer**, University of Washington, Bothell, Center for University Studies and Programs
Jan – Jun 2007	**Adjunct Lecturer**, Western Washington University, Department of Chemistry
Sept 2001 – Dec 2006	**Teaching Assistant**, University of Washington, Department of Chemistry
Aug – Sept 2005	**Teaching Assistant**, University of Washington, College of Arts and Sciences Discovery Seminar

AWARDS AND FELLOWSHIPS

Awards

2024	**Distinguished Teaching Award**, University of Washington.
2015	**Distinguished Teaching Award for Innovation with Technology,** University of Washington. Team nomination (with Dr. Jasmine Bryant, Prof. Andrew Boydston, and Prof. Stefan Stoll)

* Effective September 2020, the University of Washington established a new professorial teaching track that resulted in a title change from Senior Lecturer to Associate Teaching Professor without a change in appointment. More information about this change can be found here: https://ap.washington.edu/blog/2020/08/university-of-washington-to-implement-a-new-professorial-teaching-track/

2015 **Outstanding Faculty Award**, University of Washington Interfraternity Council and Panhellenic Association

2014 **Nominee, Distinguished Teaching Award for Innovation with Technology**, University of Washington. Individual nomination

2001 **Outstanding Analytical and Instrumental Chemistry Student**, Department of Chemistry, University of Colorado, Denver

Professional Fellowships

Mar 2018 – Jun 2023 **Academic and Student Affairs Teaching Fellow**, University of Washington. Built campus-wide network around teaching and learning issues, with the Center for Teaching and Learning as the hub. Developed programs to build knowledge of and expertise with evidence-based teaching practices.

Sept 2018 **Faculty Fellows Program Senior Fellow**, University of Washington, Center for Teaching & Learning. Developed programming themes for the 2018 teaching orientation program. Delivered a workshop on large-lecture instruction.

Aug 2013 **Teaching with Technology Fellows Institute**, University of Washington, Center for Teaching & Learning. Participated in intensive, competitive-entry workshop to develop an online/hybrid version of a Preparatory Chemistry course, previously taught in a lecture-only format. (Director: Brigid Nulty)

Graduate Fellowships

2005-2006 **Center on Materials and Devices for Information Technology Research (CMDITR) Graduate Fellow**, University of Washington

2004-2005 **Alvin Kwiram Graduate Fellow**, Department of Chemistry, University of Washington

Summer 2004 **Seaborg Institute Fellow**, Los Alamos National Laboratory

2001-2002 **Mindlin Brothers Graduate Fellow**, Department of Chemistry, University of Washington

INSTRUCTIONAL LEADERSHIP

All University of Washington Seattle, except where noted.

Curriculum Development and Dissemination

Aug 2025 – Present **Developer, Learning Objectives for the Dept. of Chemistry General Chemistry Sequence (CHEM 1x2)**. Developed a suite of student-centered learning objectives aligned with department-defined course outcomes for each course in our three-course general chemistry sequence. Currently aligning all course materials (textbook readings, class lesson notes, homework assignments, and exams) with the learning objectives so the alignment can be communicated to students. When complete, revised course materials will be shared with all general chemistry faculty. (co-developer: Alec Kroll)

Aug 2021 – Jun 2022: **Developer, "Catalyze Student Success" Project**. Created a suite of research-backed learning strategies to support students during their return to in-person instruction in Fall 2021 following the COVID-19 pandemic. These resources are evergreen, and have been used to reform TA training and instruction throughout the Chemistry Department.

Aug 2020 – Jun 2021 **Developer, Committee for Remote Teaching & Learning website**. Developed a website containing best practices in pedagogy and use of technology to aid Chemistry faculty members' shift to remote instruction during the 2020-21 academic year due to the COVID-19 pandemic. (co-developers: Matt Bush, Paul Isaac, Samantha Robinson, Josh Vaughan).

Dec 2020 – Mar 2021	**Coordinator and Developer, Lecture Video Series for CHEM 152**. Coordinated an effort to create lecture videos employed to deliver course content asynchronously in CHEM 152. Although developed for the acute needs of remote teaching during the COVID-19 pandemic, these videos can be reused in future courses to implement a "flipped" instructional model (co-coordinators/-developers: Charles Barrows, Daniel Chiu, Sarah Keller, Anne McCoy).
Mar 2020	**Coordinator, Emergency Online Final Exam for CHEM 152/153**. Coordinated with the Winter 2020 CHEM 152/153 faculty (Charles Barrows, Daniel Chiu, and Anne McCoy) to develop a remote version of the final exam via the online homework platform ALEKS due to the suspension of in-person course events at UW.
Jun – Dec 2018	**Developer, "Activated" CHEM 142, Department of Chemistry**. Implemented a suite of evidence-based active learning practices in the first-quarter general chemistry course, including: lesson-specific learning goals, pre-class reading quizzes, in-class concept tests, and peer-led team learning in discussion section. Taught renovated course in Autumn quarter 2018 and 2019. (On average, students in the 2018 course outperformed students in the baseline, lecture-only course on the identical final exam, a statistically significant result.) Shared all developed materials with other faculty so they could "activate" their 142 courses as well. (co-developer: Cynthia Stanich; course coordinator: Abbie Pickering)
2014 – 2017	**Author, Morton Publishing (now owned by Top Hat Publishing)**. Developed college-level general chemistry laboratory manual that focuses on conceptual understanding. First edition published Spring 2017. (Co-author: Kim Gunnerson, UW Bothell)
2014 – 2015	**Developer, Atoms-First General Chemistry Curriculum, Department of Chemistry**. Worked with a team of teaching faculty (Jasmine Bryant, Andrea Carroll, and Deborah Wiegand) to reorganize the three-quarter general chemistry sequence using "atoms-first" approach, in which atomic theory, electronic structure, bonding, and molecular structure are covered in the first quarter, with subsequent topics introduced as consequences of underlying molecular structure. Adapted existing or developed new course materials as needed, and shared them with the Department to ease the switch for non-teaching track faculty. The new curriculum was rolled out in Autumn 2015.
Jun – Jul 2014	**Reviewer, ALEKS Corporation**. Reviewed general chemistry content for online tutorial system ALEKS (Assessment and LEarning in Knowledge Spaces). Conducted deep reading of 400+ chemistry topics comprising 4-6 conceptual or computational problems each. Suggested edits, updates, or additions for ~200 topics, and suggested ~200 new topics.
Aug – Dec 2013	**Developer, New CHEM 110 Curriculum, Department of Chemistry.** Developed a new curriculum for CHEM 110, Preparation for General Chemistry, as my project for the Teaching with Technology Fellows Institute. The renovated course was organized into five units—Relationships, Communication, Representation, Connecting, and Change—with each unit designed around a set of questions that a person might ask if they were curious about how chemistry works. One class day per week was "flipped", where students watched a short lecture video in advance, and then worked in groups on a case study activity related to the video content. Taught renovated course in Autumn quarters of 2013, 2014, and 2015.
May 2011 – May 2012	**Lab Curriculum Developer, Seattle Central Community College Chemistry Department**. Adapted existing paper-based CHEM 161 pre- and post-lab exercises for delivery online using the course-management system ANGEL.
Apr 2008 – Mar 2010	**Chemistry Tutorial Developer, W.H. Freeman**. Developed materials for web-based concept tutorials to supplement an introductory chemistry textbook aimed at allied-health majors. Developed list of 64 essential tutorial topics for the sixteen-chapter book and wrote 32 tutorials. Created detailed rubric for a comparison report of competing materials in various introductory chemistry markets. Adapted eighteen molecular model kit exercises from the text as online tutorials for distribution with the electronic version of the textbook.

Aug 2009 **Chemistry Activity Developer, Seattle BioMed**. Developed a one-hour in-class chemistry activity and a three-hour chemistry laboratory activity for high school students, as part of an overall project to enhance science education in Washington State high schools serving at-risk students. The activities explored chemical concepts within the context of folk medicines that are used in the developing world to treat diarrhea.

Program Development

April 2022 – Jun 2023 **Developer and Organizer, Reflection and Practice Seminar Series, Center for Teaching & Learning**. Co-organizer of a multidisciplinary seminar series that highlights original research and intentional reflection by scholars committed to high-quality teaching in higher education contexts. (Co-organizers: Penelope Moon, Katie Malcolm, Jacob Huebsch)

Sept 2018 – Jun 2022 **Developer and Organizer, Advances in Higher Education Research Seminar Series, Center for Teaching & Learning**. Organizer of a seminar series that highlights original research in college-level learning and instruction. The series addresses the broad themes of the work of instructors, including the cognitive processes by which students learn, and the classroom context in which they do so.

Mar – Nov 2019 **Member, Graduate Certificate in Teaching Task Force, Center for Teaching & Learning and UW Graduate School**. Coordinated with representatives from the Provost's Office, UW Libraries, the Graduate School, and CTL to develop recommendations for the creation of a Graduate Certificate in Teaching, aimed at graduate students across disciplines and program types pursuing teaching in a variety of disciplines and careers, including but not limited to faculty in higher education

Jan 2015 – Jan 2018 **Faculty Facilitator, Waseda University/University of Washington Joint Center for Teaching, Learning & Technology (J-CTLT)**. Member of joint initiative between Waseda University in Tokyo and University of Washington. The goals of the center are to share best practices, promote the use of evidence-based teaching methods, and develop pedagogical research collaborations. (UW Lead: Beth Kalikoff)

Mar – Aug 2014 **Developer, Large-Lecture Instruction Resources, Center for Teaching & Learning Website.** Developed extensive set of online teaching resources focused on the unique challenges of large-lecture instruction (100+ students). (Co-developers: Peter Wallis, Monica Huerta)

Workshop Development and Delivery

April 2022 – Jun 2023 **Developer and Facilitator, Evidence-Based Teaching Program Fellowship, Center for Teaching & Learning.** Worked with CTL leadership to re-tool a popular faculty development program to give it greater focus, rigor, and impact. Formerly a series of independent, quarter-long learning communities, EBT is now a two-year fellowship in which instructors design and implement a research project to increase student retention and success. I facilitate monthly discussion of evidence-based pedagogy among the fellows, and mentor them through the design and implementation of a shared research project. (Co-developers: Penelope Moon, Katie Malcolm, Jacob Huebsch)

May 2022 – Mar 2023 **Developer and Facilitator, Data Analysis for Reflective Teaching (DART) Workshop**, **Center for Teaching & Learning**. Developer of a workshop to teach data analysis skills using the R programming language to faulty and graduate students, in order to support their reflective teaching practices. (Co-developers: Elli Theobald, Ranjini Grove, Jin-Kyu Jung)

Apr – Jun 2020 **Developer and Organizer, Remote Teaching Pop-Up Series, Center for Teaching & Learning**. Developed and organized a weekly online panel-discussion series exploring timely topics related to remote teaching due to the COVID-19 pandemic. Sessions included best-practices and essential aspects of effective remote instruction along with opportunities to share

ideas and resources. (Co-developers/-organizers: Robyn Foshee, Milan Vidakovic, Beth Kalikoff)

Apr 13-14, 2019 — **Organizer, Western States Chemistry Education Group Meeting**. Organized the 6th annual meeting of the Western State Chemistry Education Group, an affiliation of faculty with a shared interest in best practices in chemistry education and the development and training of graduate students. (Co-organizers: Andrea Carroll, Larry Goldman, Samantha Robinson, Debbie Wiegand, Tam'ra-Kay Francis, Michael Mack, Abbie Pickering, Cynthia Stanich)

Jan – Jun 2019 — **Developer and Facilitator, Evidence-Based Teaching Reading Group, Center for Teaching & Learning**. Facilitator for journal club focusing on literature from the scholarship of teaching and learning (SoTL) and discipline-based education research (DBER). Met biweekly.

Sept 2016 – May 2017 — **Faculty Coach, Evidence-Based Teaching Program, Center for Teaching & Learning**. Facilitated discussions among a group of ~6 faculty on evidence-based practices in teaching: what they are and how to incorporate them into the classroom. Met biweekly for three quarters.

Aug 2015 — **Session Facilitator, "Technology in Practice", Faculty Fellows Program, Center for Teaching & Learning**. Presented best practices for incorporating technology into a class in ways that support pedagogical improvements and ease the instructor's burden. (Co-facilitators: Jasmine Bryant and Stefan Stoll).

Aug 2014 — **Organizer and Session Facilitator, Large Lecture Collegium, Center for Teaching & Learning.** Developed program for the day-long collegium in cooperation with Center for Teaching and Learning staff (Co-organizers: Karen Freisem, Christine Sugatan). Facilitated session on methods to engage students in large classes (Co-facilitator: Peter Wallis).

Aug 5 & 7, 2014 — **Session Facilitator, First-Year Programs' Parent Orientation, Center for Teaching & Learning.** Presented tips for success in college to parents of in-coming freshmen. (Event Coordinator: Christine Sugatan)

Mar 2014 — **Session Facilitator, "Flipping a Large Classroom: How-To's and Better-Not's", University of Washington, Bothell Large Lecture Collegium**. Lead discussion on techniques for "flipping" a large-lecture course. (Event Organizer: Erin Hill)

Jan – Mar 2014 — **Organizer and Facilitator, "Engaging Students in Large Classes" Learning Community, Center for Teaching & Learning**. Met weekly with group of ~10 UW faculty and graduate students to discuss issues specific to lecture classes of 100-600 students. (Co-organizer: Peter Wallis)

GRANT ACTIVITY

Jun 2023 — **UW Royalty Research Fund**. Not Funded ($38,548). *Project Goal*: Investigate the thinking processes exhibited by students as they solve general chemistry problems during think-aloud interviews.

Jan 2020 — **HHMI Inclusive Excellence 3, Pre-proposal**. Application was not advanced to 2nd round. *Project Goal:* Renovate introductory chemistry curriculum to improve outcomes and increase diversity, equity, and inclusion.

2014-2020 — **HHMI Undergraduate Science Education,** FUNDED. **Sub-awardee: $18,075**. *Project Goal:* Increase the persistence of UW students from all backgrounds majoring in science, technology, engineering, and math (STEM), and develop their adaptive expertise. **PI: Scott Freeman**.

RESEARCH PROJECTS

All members affiliated with UW Chemistry, except where noted.

Development of General Chemistry Version of Marzano's Taxonomy of Learning

Application of Marzano's Taxonomy of learning to a collection of multiple-choice general chemistry exam questions, which were previously characterized via Bloom's Taxonomy of learning and a complexity rubric developed by the ACS exams institute. *Project Goals*: (1) to develop a chemistry-specific interpretation of Marzano's Taxonomy; (2) to compare student performance on the questions through the Marzano, Bloom, and ACS complexity rubric lenses.

Statistical Assessment of the Impacts of Teaching Interventions on Student Performance and Affect in Introductory Chemistry Courses at UW Chemistry

Application of multilevel modelling regression and text-analysis techniques to exam-performance and survey data collected from general and organic chemistry courses, in which various teaching interventions were deployed. *Teaching Interventions Deployed*: (1) the impact of two-stage quizzes on student affect and performance on the final exam; (2) "Catalyze Student Success" a suite of learning strategies designed to bolster metacognition and course performance during the return to in-person instruction following the COVID-19 pandemic.

Former Research Mentees

Oct 2023 – Mar 2024	Jeffrey Jacquez, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Jan 2022 – Sept 2023	Sophia Pontenberg, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Oct 2022 – Jun 2024	Max Stewart, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Oct 2022 – Jun 2023	Alice Sohn, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Jul 2022 – Jun 2023	Lukas Zha, Undergraduate. Text analysis of affect survey data.
Jun 2022 – Aug 2023	Mark Bertolami, Graduate Student. Chemistry-specific interpretation of Marzano's Taxonomy
Jan 2022 – Aug 2023	Maya Xiang, Undergraduate. Statistical analysis of two-stage quizzes
Sept 2021 – Aug 2023	Anna Merkulov, Graduate Student, Development & analysis of "Catalyze Student Success"
Jun 2021 – Aug 2023	Jacob Finney, Graduate Student with Prof. Anne McCoy. Chemistry-specific interpretation of Marzano's Taxonomy
Nov 2020 – Jun 2022	Jackson Hughes, Undergraduate. Statistical analysis of two-stage quizzes
Oct 2020 – Jun 2021	Ganling Zhang, Undergraduate. Statistical analysis of two-stage quizzes
Jan 2020 – Jun 2023	Rhonda Osman, Undergraduate; Post Baccalaureate as of Jun 2022. Chemistry-specific interpretation of Marzano's Taxonomy
Jan 2020 – Jun 2021	Myles Avila, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Jun 2019 – Jun 2022	Garvit Mittal, Undergraduate. Chemistry-specific interpretation of Marzano's Taxonomy
Sept 2018 – Aug 2020	Abbie Pickering, Post-Baccalaureate Associate - Implementation and analysis of active learning in CHEM 142 - Exploration of student dynamics during group stage of two-stage assessments
Jun 2017 – Mar 2020	Michael Mack, Post-doctoral Associate - Implementation and analysis of active learning in CHEM 142 - Exploration of student dynamics during group stage of two-stage assessments - Determining extensive factors between skill and overconfidence in general chemistry

Jun – Aug 2019	Samantha Gunnerson, Post-Baccalaureate Associate - Exploration of student dynamics during group stage of two-stage assessments
2018 – 2019	Rayne Anderson, Undergraduate - Determining extensive factors between skill and overconfidence in general chemistry
2018 – 2019	Shuyi Tan, Undergraduate - Determining extensive factors between skill and overconfidence in general chemistry
2012 – 2013	Jacob Parikh, Undergraduate - A statistical analysis of the efficacy of online learning in general chemistry
Jan – Aug 2010	Bonnie Mattson, Undergraduate, Division of Science & Math, Seattle Central Community College [now Seattle Central College] - Computational Studies of 2',7'-Dichlorofluorescein in Vacuum and in Potassium Acid Phthalate

K-12 OUTREACH

May 2011 – May 2017	**Coordinator for UW in the High School, University of Washington, Department of Chemistry.** Developed a version of UW's CHEM 110 (Introduction to General Chemistry) for delivery at Washington State high schools. Coordinate with several area high school chemistry teachers to develop the course. This program gives high school students the opportunity to take a college level course in the familiar environment of their high school.
May 2009	**Event Supervisor: West Central Washington Regional Science Olympiad.** Developed and supervised an acid-base chemistry lab event for high school students and a forensic-chemistry event for middle school students during the 2009 tournament.
Apr 2008, Apr 2009	**Judge, Mentor: Student Biotechnology Expo, sponsored by the Northwest Association for Biomedical Research**. Served as a Mentor for the 2009 Expo, and as a Judge for the 2008 Expo. The Expo is an opportunity for Seattle-area high school students to present projects in biotechnology and molecular biology.

DEPARTMENTAL SERVICE

All University of Washington, Department of Chemistry

Sept 2025 – Present	**Co-chair**, CHEM 1x2/1x3 Education Committee
Sept 2025 – Present	**Chair**, Evaluative Committee for Asst. Teaching Professor Alec Kroll
Mar 2021 – Present	**Chair**, Evaluative Committee for Assoc. Teaching Professor Samantha Robinson
Dec 2016 – Present	**Content Curator**, ALEKS (Chemistry Tutorial System)
Sept 2012 –Present	**Organizer and Presenter**, Graduate Student Orientation
Mar 2022 – Jun 2024	**Member**, Evaluative Committee for Asst. Teaching Professor Lutz Maibaum
Sept 2020 – Jun 2025	**Member**, CHEM 1x2/1x3 Education Committee
Sept 2023 – Apr 2024	**Co-chair**, Assistant Teaching Professor Search Committee
Sept 2022 – Jun 2024	**Chair**, Website Committee
May 2021 – Jun 2022	**Developer and Organizer,** Chemistry Education Seminar Series
Sept 2019 – Jun 2022	**Member**, Website Committee
Jul 2020 – Jun 2021	**Chair**, Committee for Remote Teaching & Learning
Mar 2020 – Dec 2020	**Developer**, General Chemistry Exam Question Bank

Sept 2015 – Jul 2020	**Organizer**, Chemistry Education Research (ChEdR) Group
Sept 2012 – Jun 2020	**Member**, Undergraduate Curriculum Committee
Sept 2012 – Dec 2016	**Administrator**, ALEKS (Chemistry Tutorial System)
Mar 2013	**Presenter**, Women in Chemical Sciences Seminar Series
May 2010	**Presenter**, Careers in Chemistry Seminar Series

UNIVERSITY SERVICE

All University of Washington

Oct 2018 – Jun 2024	**Chair, University Bookstore Digital Trends Committee**. Inform and advise the University Bookstore Board on industry trends and potential opportunities related to the use of technology on campus.
Oct 2018 – Jun 2024	**Member, University Bookstore Board of Trustees**. Represent and protect the interests of the beneficiaries of the University Trust (UW students, faculty, and staff); Ensure that the company's assets are managed judiciously.
Oct 2020 – Jun 2023	**Organizer and Facilitator (Oct 2020 – Oct 2022); Member (Oct 2022 – Jun 2023); Advisory Council for Technology-enhanced Teaching (ACTT)**. Founding organizer and facilitator for a council of ~20 faculty and staff whose purpose is to identify and address emergent issues at the intersection of teaching and technology, and to disseminate methods for supporting technology-enhanced teaching and learning during the COVID-19 pandemic and beyond (co-organizers/-facilitators: Dave Coffey, Robyn Foshee, Katie Malcolm, El Schofield).
Sept 2020 – Jun 2021	**Mentor for Asst. Teaching Professor Luna Huang in Materials Science and Engineering**. Offer support, institutional context, and networking opportunities to MSE's first assistant teaching professor faculty member. Advise specifically on promotion package development.
Oct 2015	**Member, Campus-Wide Classroom Upgrades Committee, Capital Projects Office.** Advise on structural, cosmetic, and technological upgrades to Bagley 131 and Loew Hall classrooms. (Project Manager: Everett Spring)
Spr 2013, 2014, 2015	**Reviewer, Mary Gates Endowment for Students Research Scholarship.** Reviewed applications for the Mary Gates Research Scholarship for undergraduates. (Director: Janice Decosmo)

CHEMISTRY ADVISORY BOARDS AND REVIEWS

Sept 2013 – Aug 2014	**Reviewer**, General Chemistry textbook, Open Stax
Aug 2013	**Reviewer**, Preparatory Chemistry textbook, Oxford University Press
Nov – Dec 2011	**Reviewer**, Atoms-First General Chemistry textbook, Norton
Oct 25-28, 2011	**Participant**, Chemistry Advisory Board, WebAssign, Raleigh, NC
Sept 29 – Oct 1, 2011	**Participant**, General Chemistry Focus Group, McGraw-Hill, Chicago, IL
Oct 22, 2010	**Presenter**, Chemistry Symposium, ALEKS Corporation, San Francisco, CA
Feb 26, 2010	**Participant**, Chemistry Symposium, ALEKS Corporation, Austin, TX

PROFESSIONAL DEVELOPMENT

2025	**Course Redesign Clinic,** UW Center for Teaching and Learning, Aug-Sept
2024	**Biennial Conference on Chemical Education**, Lexington, KY, Jul 28-Aug 1
2022	**Biennial Conference on Chemical Education**, West Lafayette, IN, Jul 31-Aug 4
	American Chemical Society Meeting, San Diego, CA, Mar 20-24
	UW 2022 Winter Quarter Software Carpentry Workshop, Online, Jan 10-13
2021	**Mastery Grading Canvas Course**, College Bridge, Online, Jul 14-Aug-25
	Society for the Advancement of Biology Education Research, Online, Jul 9, 16, 23, 30
	Fostering Trust in the Classroom Canvas Course, UW Bothell, Online, Jul 12-16
	Accelerating System Change Network / Network of STEM Education Centers Joint Meeting, Online, Jun 9-11
	Project TIER (Teaching Integrity in Empirical Research) Symposium, Online, Mar 5, 12, 19, 26; Apr 16, 23, 30; May 7, 14, 21
2020	**GitHub Universe**, Online, Dec 8-10
	Teaching Online 101 Canvas Course, UW Bothell, Online, Aug
	Society for the Advancement of Biology Education Research, Online, Jul 10 & 17
	Network of STEM Education Centers National Meeting, Online, Jun 10-11
2019	**Summer Institute in Statistics for Big Data session: Data Wrangling with R**, UW Biostatistics Dept., Jul 15- 17
	Summer Institute in Statistical Genetics session: Regression Methods, UW Biostatistics Dept., Jul 10- 12
	American Chemical Society Northwest Regional Meeting, Portland, OR, Jun 16-19
	Network of STEM Education Centers National Meeting, Omaha, NE, May 31 – Jun 2
2018	**Biennial Conference on Chemistry Education**, Notre Dame University, South Bend, IN, Jul 29 – Aug 2
	Network of STEM Education Centers National Meeting, Columbus, OH, Jun 6-8
	Western States Chemistry Education Group Meeting, University of Oregon, Eugene, OR, Apr 21-22
2017	**Gordon Research Conference on Chemistry Education Research**, Bates College, Lewiston, ME, Jun 18-23
	Western States Chemistry Education Group Meeting, University of Colorado, Boulder, CO, Apr 22-23
2016	**Biennial Conference on Chemistry Education**, University of Northern Colorado, Greeley, CO, Jul 31 – Aug 4
2014	**Conference on Case Study Teaching in Science**, National Center for Case Study Teaching in Science, University at Buffalo, Buffalo NY, Sept 19-20
	National Teaching Assistant Workshop, Cottrell Scholars Collaborative, Georgia Institute of Technology, Atlanta, GA, May 28-30
2013	**ACS National Meeting**, New Orleans, LA, April 7-11
	"Creating an Active, 'Flipped' Classroom (Without Flipping Out)" Workshop, Center for Teaching and Learning, University of Washington, Mar 14
2012	**Faculty Fellows Program**, University of Washington Teaching Academy, Sept 10-14

ACS National Meeting, Philadelphia, PA, Aug 19-23

Large Lecture Collegium, University of Washington Center for Teaching & Learning, Aug

SCIENCE WRITING AND EDITING

Jul – Nov 2010	**Editor, University of Washington Department of Genome Sciences Education Outreach**. Edited, formatted, and assisted in publishing a 400-page high-school science curriculum that teaches students about the process of scientific research. (Project Supervisor: Maureen Munn)
2006 – 2009	**Contributor, Sea Star, Washington Sea Grant Program newsletter.** Wrote news articles on current research projects funded by Washington Sea Grant for its internal newsletter. (Editor: David Gordon)
2005 – 2006	**Contributor, Northwest Science & Technology (www.nwst.org).** Wrote news articles highlighting research performed by northwest scientists. (Editor: Deborah Illman)
2006	**Associate Editor, Chem Letter, University of Washington Department of Chemistry newsletter**. (Editor: Shanon Radford)
2006	**Associate Editor, Light Works, Center on Materials and Devices for Information Technology Research newsletter**. (Editor: Margaret Harden)

PUBLICATIONS

Academic

- **Craig, C. F.;** Gunnerson, K. "Exploring General Chemistry in the Laboratory," Morton Publishing: Englewood, CO, 2017.
- Duncan, W. R.; **Craig, C. F.;** Prezhdo, O. V.; "Time-Domain Ab Initio Study of Charge Relaxation and Recombination in Dye-Sensitized TiO_2," J. Am. Chem. Soc., 129, 8528 (2007).
- Prezhdo, O. V.; **Craig, C. F.;** Fialkov, Y.; Prezhdo, V. V.; "Control of Chemical Equilibrium by Solvent: A Basis for Teaching Physical Chemistry of Solutions," J. Chem. Ed., 84, 1348 (2007).
- Kilina, S. V.; **Craig, C. F.;** Kilin, D. S.; Prezhdo, O. V.; "Ab initio time-domain study of phonon-assisted relaxation of charge carriers in a PbSe quantum dot," J. Phys. Chem. C, 111, 4871 (2007).
- Prezhdo, O. V.; Duncan, W. R.; **Craig, C. F.;** Kilina, S. V.; Habenicht, B. F.; "Photoexcitation dynamics on the nanoscale," in Quantum Dynamics of Complex Molecular Systems, Springer Series in Chemical Physics, 83, pp. 5-30, D. A. Micha, I. Burghart (eds.) (Springer-Verlag, 2006).
- Habenicht, B. F.; **Craig, C. F.;** Prezhdo, O. V.; "Time-Domain ab initio simulation of electron and hole relaxation dynamics in a single-wall semiconducting carbon nanotube," Phys. Rev. Lett., 96, 187401 (2006).
- **Craig, C. F.;** Duncan, W. R.; Prezhdo, O. V.; "Trajectory surface hopping in the time-dependent Kohn-Sham approach for electron-nuclear dynamics," Phys. Rev. Lett. 95, 163001 (2005)
- Damrauer, R.; Crowell, A. J.; **Craig, C. F.;** "Electron, hydride, and fluoride affinities of silicon-containing species: computational studies," J. Am. Chem. Soc., 125, 10760 (2003)

Non-academic

All as sole author. (Pre-2007 articles are not available online.)

- "F+RNA Coliphage Study Opens Window on Oakland Bay Water Quality," feature article; Sea Star, WA Sea Grant Program newsletter; Autumn 2009.

- "WSG Funds a Second Look at Glass Sponge Reefs," feature article; Sea Star; Autumn 2008.
- "Glass-Sponge Reefs: Deep-sea Habitats and Inhabitants Astound Scientists on WSG-funded Cruise," feature article (cover story); Sea Star; Autumn 2007.
- "What's Missing? The Sound's Marine Riparian Areas," feature article; Sea Star; Summer 2006.
- "Codes in Cod Genes," feature article (cover story); Sea Star; Spring 2006.
- "Oceanic Bacterium Is Big for Its Size," news feature, Northwest Science & Technology; Winter 2006.

PRESENTATIONS

Invited Talks

- "Can an 'activated' large-lecture general chemistry course narrow the achievement gap and improve student affect?" ACS National Meeting, Philadelphia, PA, Mar 22-26, 2020. *Meeting cancelled due to COVID-19 pandemic.*
- "Implementing and measuring the efficacy of high-structure and active learning in a large-lecture general chemistry course," ACS Northwest Regional Meeting, Portland, OR, Jun 16-19, 2019.
- "Research-based Teaching, and the Center for Teaching, Learning and Technology," Joint Center for Teaching, Learning, and Technology Kick-off Seminar, Waseda University (Tokyo), Jul 7, 2015.
- "ALEKS (Assessment and LEarning in Knowledge Spaces) at UW Chemistry," University of Washington Ignite! Event, Oct 25, 2012.

Contributed Talks

- "Development of a Multi-disciplinary Journal Club on Teaching and Learning," Network of STEM Education Centers National Conference, Omaha, NE, May 31 – Jun 2, 2019.
- "Neither Capricious nor Arbitrary, But Then What? An Exploration of Grading Practices" Western States Chemistry Education Group, Eugene, OR, Apr 2018.
- "Decreasing Performance Gaps in General Chemistry," Western States Chemistry Education Group, Boulder, CO, Apr 2017 (Co-Presenter: Deborah Wiegand).
- "A Comparison of Two Online Learning Systems in General Chemistry at the University of Washington," Chemical Education division, ACS National Meeting, Philadelphia, PA, Aug 19-23, 2012.

Posters

Presenters are underlined

- "Interviewing Students to Investigate the Thinking Processes They Employ While Solving Exam Questions from General Chemistry," Max Stewart, Jeffery Jacquez, Sophia Pontenberg, Jacob Finney, Mark Bertolami, **Colleen Craig**. University of Washington Undergraduate Research Symposium, May 17, 2024.
- "A New Approach to Characterizing General Chemistry Exam Questions Using Marzano's Taxonomy," Rhonda Hasan Osman, Garvit Mittal, Myles Avila, Jacob Finney, Santiago Toledo, **Colleen Craig**. University of Washington Undergraduate Research Symposium, May 20, 2022.
- "Developing a Joint Pedagogy Program for Online Faculty Development Seminars," Yusuke Morita, Yutaka Ishii, Katie Malcom, **Colleen Craig**, Milan Vidaković, Karen Freisem. Hawaii International Conference on Education, Jan 4-7 2020.
- "Implementing and measuring the efficacy of high structure, active learning, and peer-mentors in a large lecture general chemistry course," Cynthia Stanich, Michael R. Mack, Abbie Pickering, **Colleen Craig**. Gordon Research Conference: Chemistry Education Research and Practice, Lewiston, ME, Jun 16-21, 2019.

- "Determining the extensive factors between skill and overconfidence in general chemistry at the University of Washington," Shuyi Tan, Rayne Anderson, Michael Mack, **Colleen Craig**. University of Washington Undergraduate Research Symposium, May 17, 2019.
- "Experimental design of a study to determine if two-stage exams can improve outcomes and reduce anxiety in general chemistry," **Colleen Craig**, Cynthia Stanich, Scott Freeman. Gordon Research Conference: Chemistry Education Research and Practice, Lewiston, ME, Jun 18-23, 2017.
- "Student reaction to a flipped introductory chemistry class," Tracy Stanzel, Addie Kingsland, **Colleen Craig**. University of Washington Symposium on Teaching and Learning, Apr 15, 2014.
- "A statistical analysis of online learning in general chemistry at the University of Washington," Jan Irvahn, Jacob Parikh, Andrea Carroll, Philip J. Reid, **Colleen Craig**. University of Washington Undergraduate Research Symposium, May 17, 2013.
- "A statistical analysis of online learning in general chemistry at the University of Washington," Jan Irvahn, Jacob Parikh, Andrea Carroll, Philip J. Reid, **Colleen Craig**. University of Washington Symposium on Teaching and Learning, Apr 16, 2013.
- "A statistical analysis of online learning in general chemistry at the University of Washington," Jan Irvahn, Jacob Parikh, Andrea Carroll, Philip J. Reid, **Colleen Craig**. Chemical Education poster session, ACS National Meeting, New Orleans, LA, April 7-11, 2013. (Selected for Sci-Mix poster session)
- "Math preparation of undergraduates in general chemistry, a gatekeeper course required for biophysicists," Cynthia Stanich, **Colleen Craig**, Sarah Keller. Chemical Education poster session, ACS National Meeting, Philadelphia, PA, Aug 19-23, 2012.
- "Math preparation of undergraduates in general chemistry, a gatekeeper course required for biophysicists," Cynthia Stanich, **Colleen Craig**, Sarah Keller. University of Washington Symposium on Teaching and Learning, Apr 17, 2012.
- "Math preparation of undergraduates in general chemistry, a gatekeeper course required for biophysicists," Cynthia Stanich, **Colleen Craig**, Sarah Keller. Biophysics Education poster session, 56th Annual Meeting of the Biophysical Society, San Diego, CA, Feb 25-29, 2012.
- "Computational Studies of 2',7'-Dichlorofluorescein in Vacuum and in Potassium Acid Phthalate," Bonnie Mattson, **Colleen Craig**. University of Washington Undergraduate Research Symposium, May 21, 2010.
- "Trajectory surface-hopping molecular dynamics: Back-transfer in a dye-sensitized semiconductor system," Walter Duncan, **Colleen Craig**, Oleg Prezhdo. Computers in Chemistry Division, ACS National Meeting, San Francisco, CA, September 10-14, 2006.
- "Electron relaxation dynamics in carbon nanotubes," Brad Habenicht, **Colleen Craig**, Oleg Prezhdo. Computers in Chemistry Division poster session, ACS National Meeting, San Francisco, CA, Sept 10-14, 2006.
- "Trajectory surface hopping in the time-dependent density functional theory for electron-nuclear dynamics," **Colleen Craig**, Walter Duncan, Oleg Prezhdo. American Conference on Theoretical Chemistry (ACTC05), Los Angeles, CA, Jul 16-21, 2005.
- "Investigation of fluorescence quenching in the green fluorescent protein chromophore via quantum chemical methods and non-adiabatic molecular dynamics," **Colleen Craig**, Oleg Prezhdo. 52nd Western Spectroscopy Association Conference, Monterey, CA, Jan 26-28, 2005.
- "Computational study of fluorescence quenching of the green fluorescent protein chromophore," **Colleen Craig**, Oleg Prezhdo. National Workshop on Quantum and Semiclassical Molecular Dynamics of Nanostructures, Los Alamos National Laboratory, NM, Jul 15-17, 2004.

- "Comparative study of rotation barriers in the green fluorescent protein chromophore by several quantum-chemical approaches," **Colleen Craig**, Oleg Prezhdo. Chemical Physics Section of the Northwest Regional Meeting of the American Physical Society, Portland, OR, May 29-31, 2003.

AFFILIATIONS

American Chemical Society

Western States Chemistry Education Group

Teaching Integrity in Empirical Research (TIER) Network

TEACHING

All UW Department of Chemistry. Quarterly course credit hours and number of students per class section are indicated.

CHEM 110, **Preparation for General Chemistry** (3.0 credits). Basic concepts of chemistry and quantitative problem solving. For students without high school chemistry or with limited mathematics background.

CHEM 120, **Principles of Chemistry** (5.0 credits). First course in a three-quarter overview of general, organic, and biochemistry. Not for students majoring in biochemistry, chemistry, or engineering.

CHEM 142, **General Chemistry I** (5.0 credits). First course in a three-quarter sequence for science and engineering majors. Atomic nature of matter, quantum mechanics, ionic and covalent bonding, molecular geometry, stoichiometry, solution stoichiometry, kinetics, and gas laws.

CHEM 152, **General Chemistry II** (5.0 credits). Second course in a three-quarter sequence for science and engineering majors. Gas phase and aqueous equilibria, thermochemistry, thermodynamics, and electrochemistry.

CHEM 162, **General Chemistry III** (5.0 credits). Third course in a three-quarter sequence for science and engineering majors. Molecular bonding theories, liquids, solids, solutions, and introduction to organic and transition metal chemistry.

CHEM 461, **Physical Chemistry Laboratory** (3.0 credits). Physical measurements in chemistry. Vacuum techniques, calorimetry, spectroscopic methods, electrical measurements. **Taught**: Su 2013 (10)

Student Course Evaluations by Quarter (adjusted median scores on a 5.0 point scale)

CHEM 110	AU11	AU12	AU13	AU14	AU15
Enrollment	158	149	192	201	202
Response Rate	41%	48%	29%	50%	66%
Course as a whole was:	4.0	4.2	4.2	4.2	4.6
Course content was:	4.0	4.2	4.1	4.1	4.5
Instructor's contribution to course:	4.4	4.7	4.5	4.7	4.9
Instructor's effectiveness at teaching:	4.2	4.5	4.4	4.5	4.8
Combined items above:	4.2	4.4	4.3	4.4	4.7

CHEM 120	SU11
Enrollment	28
Response Rate	36%
Course as a whole was:	4.3
Course content was:	4.2
Instructor's contribution to course:	5.0
Instructor's effectiveness at teaching:	4.7
Combined items above:	4.5

CHEM 142	**SU12**	**A14[a]**	**W16**	**W16**	**A16**	**A16**	**A17**	**A17**	**A19**
Enrollment	85	563	332	278	462	518	603	609	559
Response Rate	42%	4%	43%	39%	70%	65%	57%	53%	58%
Course as a whole was:	3.7	3.8	4.3	4.5	4.6	4.5	4.5	4.5	4.6
Course content was:	3.5	3.9	4.1	4.4	4.5	4.4	4.4	4.3	4.5
Instructor's contribution to course:	3.9	4.0	4.7	5.1	5.0	4.9	4.9	5.0	5.1
Instructor's effectiveness at teaching:	3.8	3.8	4.7	5.1	5.0	4.9	5.0	5.0	5.1
Combined items above:	3.7	3.9	4.5	4.8	4.8	4.7	4.7	4.7	4.8

CHEM 142, continued	**Sp23**	**Au23**	**Au23**	**W24**	**Au24**	**Au24**	**Au25**	**Au25**
Enrollment	266	471	503	283	474	501	448	509
Response Rate	30%	44%	42%	26%	32%	29%	83%	82%
Course as a whole was:	4.5	4.4	4.6	4.0	4.5	4.6	4.2	4.4
Course content was:	4.3	4.5	4.5	4.2	4.3	4.6	4.2	4.3
Instructor's contribution to course:	4.6	5.1	5.1	4.7	4.7	5.1	4.7	4.8
Instructor's effectiveness at teaching:	4.5	5.0	5.1	4.5	4.7	5.0	4.7	4.8
Combined items above:	4.5	4.7	4.8	4.4	4.5	4.8	4.5	4.6

CHEM 152	**Su09**	**Su10**	**Sp11**	**Sp12**	**Au12**	**W13**	**Sp13**	**W14**
Enrollment	95	87	559	637	215	430	406	473
Response Rate	64%	41%	33%	33%	48%	51%	48%	69%
Course as a whole was:	4.2	4.5	4.5	4.3	4.3	4.3	4.2	4.2
Course content was:	4.0	4.3	4.4	4.2	4.4	4.1	4.2	4.1
Instructor's contribution to course:	4.5	4.6	4.9	4.8	5.0	4.6	4.6	4.6
Instructor's effectiveness at teaching:	4.3	4.7	4.8	4.6	4.8	4.6	4.5	4.5
Combined items above:	4.2	4.5	4.6	4.4	4.6	4.4	4.4	4.4

CHEM 152, Continued	**W15**	**W15**	**Sp16**	**Sp16**	**W17**	**W17**	**W18**	**W18**	**W19**
Enrollment	474	472	331	327	285	287	284	286	285
Response Rate	43%	60%	28%	20%	60%	63%	52%	49%	61%
Course as a whole was:	4.3	4.3	4.3	4.7	4.6	4.6	4.4	4.3	4.6
Course content was:	4.1	4.1	4.3	4.5	4.4	4.5	4.4	4.3	4.4
Instructor's contribution to course:	4.7	4.8	4.9	5.2	5.1	5.2	5.0	4.9	5.2
Instructor's effectiveness at teaching:	4.6	4.6	4.7	5.3	5.0	5.2	5.0	4.9	5.2
Combined items above:	4.4	4.5	4.6	4.9	4.8	4.8	4.7	4.6	4.9

CHEM 152, Continued	**W20[b]**	**W21[c]**	**W22[d]**	**Au22**	**W23**	**W24**
Enrollment	285	279	234	258	274	281
Response Rate	42%	34%	30%	44%	47%	29%
Course as a whole was:	4.7	4.1	4.0	3.7	4.1	4.4
Course content was:	4.5	4.2	4.0	3.8	4.1	4.2
Instructor's contribution to course:	5.1	4.7	4.6	4.1	4.6	4.9
Instructor's effectiveness at teaching:	5.0	4.6	4.7	4.1	4.7	4.7
Combined items above:	4.8	4.4	4.4	3.9	4.4	4.5

CHEM 162	**Au10**	**WI11**	**Sp14**	**Sp15**	**Sp15**	**A15**	**Sp17**	**Sp17**	**Sp19**
Enrollment	285	118	284	286	288	318	287	263	281
Response Rate	56%	47%	42%	43%	48%	41%	50%	49%	50%
Course as a whole was:	3.8	4.2	4.2	4.4	4.5	4.5	4.6	4.8	4.6
Course content was:	3.7	4.0	4.1	4.3	4.5	4.3	4.5	4.7	4.5
Instructor's contribution to course:	3.8	4.5	4.6	4.6	4.9	5.0	5.0	5.2	5.1
Instructor's effectiveness at teaching:	3.7	4.3	4.5	4.6	4.8	4.9	4.9	5.1	5.0
Combined items above:	3.7	4.2	4.3	4.5	4.7	4.7	4.8	5.0	4.8

CHEM 162, Continued	**Sp20[c]**	**Au20[c]**	**Au21**	**Sp22**	**Sp24**	**Sp24**
Enrollment	285	221	252	257	282	146
Response Rate	43%	38%	41%	34%	27%	26%
Course as a whole was:	4.4	4.2	4.4	4.3	4.6	4.4
Course content was:	4.4	4.1	4.2	4.2	4.5	4.2
Instructor's contribution to course:	5.0	4.6	4.9	4.5	4.9	5.0
Instructor's effectiveness at teaching:	4.9	4.5	4.8	4.5	4.8	4.8
Combined items above:	4.7	4.3	4.6	4.4	4.7	4.6

[a] I handed out paper evaluations at the end of class rather than the beginning, so most students simply left rather than completing an evaluation. That is why the response rate is so low for this course.

[b] The online course evaluation form for this course was open during the last week of instruction, which was conducted remotely due to the COVID-19 pandemic.

[c] Taught 100% remotely during the COVID-19 pandemic.

[d] The first month of this course was conducted remotely due to a surge in COVID-19 cases.