John Terhorst / Curriculum Vitæ

Chemistry Instructor / Department of Chemistry
Oregon State University / Corvallis, OR 97331

Profile: Chemistry Ph.D. with 18+ years of experience teaching and tutoring, delivering 2000+ lectures and creating course content across 10 course levels. Expert in the fields of general, organic, and computational chemistry, including molecular modeling and spectroscopy. Perceptive to individual aptitudes, motivational levels and learning curves, and able to adapt to student needs. Driven to engage students to help nurture enthusiasm and fascination for science, with a commitment to diversity, equity, and inclusion.

CAREER

Instructor
Oregon State University 📍 Corvallis, OR
📅 September 2023 – Present

- Prepare, deliver, and facilitate general and organic chemistry courses of 100–400 students.
- Service on Equity, Justice, and Inclusion (EJI) and Undergraduate Advising committees.
- Lead advisor for the Chemistry Minor (∼1000 students).
- CoSCIES Fellow, 2023–2024.

Adjunct Instructor and Subject Matter Expert
California Institute of Applied Technology 📍 National City, CA
📅 May 2023 – Present

- Deliver lectures to classes of 10–30 students according to general education learning objectives.
- Lead redevelopment of chemistry lecture and laboratory curricula and course content for remote learning.

Adjunct Professor
University of Redlands 📍 Redlands, CA
📅 August 2020 – Present

- Deliver 300+ lectures to classes of 10–30 students according to LAF/LAI learning objectives.
- Adjudicate 100+ undergraduate research projects and presentations in the Riverside County Science & Engineering Fair.

Private Tutor
WyzAnt, Inc. 📍 Redlands, CA and Irvine, CA
📅 October 2012 – December 2023

- Delivered 1800+ lessons, acquiring a 5.0/5 rating with 500+ student reviews.
- Implemented MCAT, DAT, and SAT II exam preparation plans.
- Empowered a diverse student body of 300+ students from 100+ schools and universities, serving specific and individual needs of students, leading to mastery of complex concepts, analytical reasoning, and study techniques.

Adjunct Assistant Professor
Vanguard University 📍 Costa Mesa, CA
📅 April 2012 – April 2023

- Delivered 1800+ lectures to classes of 10–70 students.
- Coordinated the Summer Undergraduate Research Program.
- Directed research for 10 undergraduate students over 5 years with projects studying pure liquids, molecular mechanics, and design of HIV inhibitors.

EDUCATION

Ph.D., Chemistry
Yale University New Haven, CT
August 2006 – December 2011

- Advisor: William L. Jorgensen, Sterling Professor of Chemistry.
- Computational solvent models, free-energy perturbation methodology, and molecular mechanics.
- Graduate Teaching Fellow, Yale Center for Science and Quantitative Reasoning.
- Dissertation: Continuum Solvent Models and Force Field Development in Computer-Aided Drug Design.

M.S., Chemistry
Yale University New Haven, CT
August 2006 – May 2008

- Courses in synthetic and physical organic chemistry, spectroscopy, organometallic chemistry, chemical biology, and computational chemistry.
- Prospectus: Calculating Born Energies with the GB/SA Solvation Model in Monte Carlo Simulations.

B.S., Chemistry and Biology
University of Redlands Redlands, CA
August 2002 – May 2006

- Double major in Chemistry and Biology.
- Graduated *Summa Cum Laude*, with Honors in chemistry.
- Thesis: Theoretical Studies of Photopumping in Photofacilitated Liquid Membranes and The [3+2] Cycloaddition of Carbonyl Oxides in the Synthesis of 1,2-Dioxolanes.

TEACHING

P, Professor / **F**, Teaching Fellow / **A**, Teaching Assistant / **T**, Tutor / **G**, Group Tutor

WyzAnt Tutoring

Introductory, Honors, A.P., General, and Organic Chemistry: Yale University, Stanford University, Dartmouth College, Tulane University, UNC Chapel Hill, Texas A&M University, University of Miami, University of Delaware, Vanderbilt University, Boston University, University of Kentucky, Phillips Andover Academy, UC Irvine, UC Riverside, UC San Francisco, University of Southern California, University of Redlands, La Sierra University, Chapman University, Cal State Fullerton, University High School, Newport Beach High School, Corona del Mar High School, Yorba Linda High School, Mater Dei High School, Troy High School, Cornelia Connelly School, Sage Hill School, Deerfield Academy, Fairmont Preparatory Academy. 1700+ hours, 2012–2023. **T, G**

Public Profile: **https://www.wyzant.com/match/tutor/80301850,** 5.0⋆ (500+ ratings)

Oregon State University

CH 121: General Chemistry I. The first of a three-part sequence in general chemistry intended for majors in fields other than the physical sciences. Topics include matter and measurement, the language of chemistry, atomic structure and electron configuration, bonding and molecular structure, solutions and concentration, and stoichiometry. Summer, 2024. **P**

CH 122: General Chemistry II. The second of a three-part sequence in general chemistry intended for majors in fields other than the physical sciences. Topics include gases, thermochemistry, intermolecular forces, phase changes, solutions, kinetics, and equilibrium. 2024–2025. **P**

CH 123: General Chemistry III. The third of a three-part sequence in general chemistry intended for majors in fields other than the physical sciences. Topics include acids and bases, solubility, thermodynamics, electrochemistry, and radioactivity. Fall, 2023, Winter and Spring, 2024. **P**

CH 331: Organic Chemistry I. The first of a two-part sequence in organic chemistry intended for majors in fields other than the physical sciences. Topics include organic structure, nomenclature, stereochemistry, nucleophilic substitution and elimination reactions of alkyl halides, stability and reactivity of alkenes and alkynes, and multistep synthesis. Fall, 2024. **P**

CH 332: Organic Chemistry II. The second of a two-part sequence in organic chemistry intended for majors in fields other than the physical sciences. Topics include organic structure, nomenclature, aromatic chemistry, stability and reactivity of carbonyl compounds, and multistep synthesis. Winter, 2025. **P**

California Institute of Applied Technology

SCI 130: Principles of Chemistry. A introductory course in general chemistry, designed for general education purposes and for students in programs that require a chemistry background. Topics include dimensional analysis, the periodic table, atomic theory, bonding, molecules and nomenclature, solutions, chemical reactions, mass relationships, acid–base theory, galvanic cells, and applications of modern chemistry. 2023–2024. **P**

University of Redlands

CHEM 231/232: Organic Chemistry I/II. The chemistry of carbon-containing compounds, their structure, nomenclature, physical properties, spectroscopy (IR, GC-MS, NMR), stereochemistry, chemical reactivities, reaction mechanisms, and synthesis. 2004–2006 and Spring, 2022. **P, T, G, A**

CHEM 131/132: General Chemistry I/II. A comprehensive survey of general chemistry, including stoichiometry and modern views of the properties, structure, and reactivity of atoms and molecules. Fall, 2003 and 2020 and Spring, 2004 and 2021. **P, T**

CHEM 102: Chemistry and the Environment. Introductory course for students wishing to explore the science or needing preparation for General Chemistry. Topics include foundations of chemistry, electromagnetic radiation, environmental change, and applications of modern chemistry such as batteries, fuels, food science, brewing, and pesticides. 2021–2024. **P**

Vanguard University of Southern California

CHEM 485: Research Topics in Chemistry. Computational, theoretical, and physical organic chemistry. Summer 2013–2018. **P**

CHEM 455: Chemistry Teaching Internship. Oversight of students planning and conducting a lecture, recitation, and/or laboratory course. Fall and Spring 2016–2021 **P**

CHEM 308: Introduction to Spectroscopy. Includes IR spectroscopy, ^{1}H and ^{13}C NMR spectroscopy, mass spectrometry, and UV/vis spectrophotometry. Spring 2014. **P**

CHEM 304/305: Organic Chemistry I/II. Functional groups, nomenclature, stereochemistry, aromaticity, reaction mechanisms, and molecular orbital theory. Summer 2012–2022, Fall 2019–2022, and Spring 2013, 2016, and 2021–2022. **P CHEM 120/121**: General Chemistry I/II. Atomic structure, bonding, stoichiometry, and reactions; kinetics, equilibrium, thermodynamics, and electrochemistry. Spring 2016–2022, and Fall 2015–2023. **P**

CHEM 113: Fundamentals of General, Organic, and Biochemistry II. Functional groups, simple organic reactions, carbohydrates, lipids, proteins, nucleic acids, and biochemical applications. Spring 2013–2015. **P**

CHEM 112C: Fundamentals of General, Organic, and Biochemistry I. Atomic theory, periodic trends, measurements, stoichiometry, chemical reactions and equilibrium, and acids and bases. Fall 2013–2014. **P**

Yale University

CHEM 222/223: Organic Chemistry Lab I/II. Reflux, TLC, recrystallization, column chromatography, extraction, Grignard chemistry, Williamson ether synthesis, aldol and Claisen condensations, and sodium borohydride reduction. Fall, 2006 and Spring, 2007. **F**

CHEM 220/221: Organic Chemistry I/II. A two-semester sequence offers a comprehensive look at the fundamental principles of organic chemistry. Covers reactivity and mechanisms in organic chemistry with an emphasis in their various roles in biological processes. Fall, 2009 and Spring, 2010. **F, T**

CHEM 114: General Chemistry I. Descriptive, inorganic, and physical chemistry. Atomic theory, stoichiometry, thermochemistry, periodicity, bonding, and molecular geometry. Fall, 2007. **F**

HONORS, AWARDS, AND FELLOWSHIPS

Dox Research Fellowship, Yale University, 2009
The Dox Fellowship was established to provide stipend support to graduate students in the field of organic chemistry, given in recognition of excellence in academics and research.

Distinguished Chemistry Fellowship, Yale University, 2006–2011
Graduate students of exceptional promise are awarded the Distinguished Chemistry Fellowship for five years of stipend support while conducting research towards the completion of a doctorate in chemistry.

Graduate *Summa cum Laude*, University of Redlands, 2006
Latin honors of *summa cum laude* are conferred upon graduating seniors who possess a cumulative GPA of 3.85 or higher.

Phi Beta Kappa, Xi Chapter of Southern California, 2006
Graduating seniors at the University of Redlands are inducted into PBK in recognition of excellence in the liberal arts and sciences.

Robert D. Engel Award, University of Redlands, 2006
The Robert D. Engel award is given to the outstanding senior science major at the University of Redlands.

Edmund C. Jaeger Award, University of Redlands, 2005
The Edmund C. Jaeger award is given by the University of Redlands for exceptional scholarship to a junior male biology student planning a career in teaching or research.

Tutor of the Year, University of Redlands, 2005
The title of Tutor of the Year is given in recognition of a tutor's valuable contributions to the University of Redlands' Tutoring Center.

RESEARCH EXPERIENCE

Director, Summer Undergraduate Research Program, Vanguard University, 2015

Research Advisor, **Computational Chemistry**, **Vanguard University**, 2013–2018
Studies of pure liquids, conformational dynamics, and design of anti-HIV agents. *Advisees*: Chris Bridges (B.S., 2014), Justin Pugh (B.S., 2014), Josiah Morales (B.S., 2014), Brennan Gregory (B.S., 2016), Chalane Records (B.S., 2015), Ashley Harris (B.S., 2016), Israel Sanchez (B.S., 2016), Emily Eggleston (B.S., 2018), Mia Kilekas (B.S., 2018), and Kacie Quiñones, (B.S., 2019).

Graduate Student, **Chemical Theory and Computation**, **Yale University**, 2007–2011
Conformational dynamics, molecular mechanical force field parameters, and new methods for computing free energies of binding using continuum solvent models in a Monte Carlo manifold. *Advisor*: William L. Jorgensen.

Undergraduate Student, **Organic Chemistry**, **University of Redlands**, 2004–2006
The [3+2] cycloaddition of carbonyl oxides in the synthesis of 1,2-dioxolanes, preparation of carbonyl oxides from precursors other than primary ozonides, and total synthesis of jasmine ketolactone. *Advisor*: David P. Soulsby.

Undergraduate Student, **Theoretical Chemistry**, **University of Redlands**, 2003–2004
Theoretical investigations of photopumping in doubly illuminated liquid membranes containing photoactive carriers. *Advisor*: Teresa Longin.

PUBLICATIONS

Terhorst, J.; Jorgensen, W. L. "*E*/*Z* Energetics for Molecular Modeling and Design." *Journal of Chemical Theory and Computation* (2010), Vol. 6, No. 9, 2762–2769. doi: **10.1021/ct1004017**

Longin, T. L.; **Terhorst, J**.; Lang, C. "Simulations of Photopumping in Doubly Illuminated Liquid Membranes Containing Photoactive Carriers." *Journal of Physical Chemistry B* (2010), Vol. 114, No. 48, 15846–15856. doi: **10.1021/jp106802q**

THESES

Terhorst, J. Continuum Solvent Models and Force Field Development in Computer-Aided Drug Design. ProQuest UMI-3496989. Ph.D. Dissertation. 2011. Yale University, New Haven, Connecticut. 153 pages.

Terhorst, J. Theoretical Studies of Photopumping in Photofacilitated Liquid Membranes and The [3+2] Cycloaddition of Carbonyl Oxides in the Synthesis of 1,2-Dioxolanes. Honors Thesis. 2006. University of Redlands, Redlands, California. 96 pages.

SCIENTIFIC PROGRAMMING

MCPRO. Jorgensen, W. L.; Tirado-Rives, J. (contributor, proprietary): Implementation of new modules for utilizing the GB/SA continuum solvent model in simulations with Monte Carlo free-energy perturbation. 2008–2011

BOSS. Jorgensen, W. L.; Tirado-Rives, J. (contributor, proprietary): Development of OPLS-AA parameters for functionalized heterocyles, and expansion of code for inclusion of solvent-by-solvent polarization within the OPLS-AA polarizable force field. 2008–2011

DIHOPT. **Terhorst, J**.; Jorgensen, W. L. (chief author, open source): A Perl utility for automated discovery and optimization of dihedral torsion coefficients for the OPLS-AA force field. 2010

SELECTED PRESENTATIONS

Terhorst, J. How Do You Know? Chemistry Seminar. Department of Chemistry, University of Redlands, Redlands, California. January, 2020.

Eggleston, E.; Kilekas, M.; **Terhorst, J**. Computer-Aided Drug Design Using Free-Energy Perturbation and Molecular Docking. SURP Symposium. Department of Chemistry, Vanguard University, Costa Mesa, California. June, 2016.

Pugh, J.; **Terhorst, J**. Computer-Aided Drug Design Concerning HIV. Southern California Undergraduate Research Conference on Chemistry and Biochemistry. Department of Chemistry, Concordia University, Irvine, California. April, 2014.

TECHNICAL SKILLS AND EXPERTISE

EduTech: Canvas, Moodle, Miro, FigJam, Anki, Trello, Wolfram|Alpha, Desmos, Zoom, Teams, Screenflow
Programming: Perl, Shell (tcsh/bash), FORTRAN, HTML, Markdown, LaTeX/Beamer, GNUplot, Microsoft Access
Chemical Simulation/Visualization: BOSS, MCPRO, QikProp, Gaussian, MGL AutoDock, Spartan, Chimera, PyMol, ChemDraw, Mnova
Subjects: General Chemistry I/II, Organic Chemistry I/II, Spectroscopy, Quantum Chemistry, Computational Chemistry

PROFESSIONAL AFFILIATIONS

American Chemical Society, COMP Group, Southern Section, **2007-Present.**
American Association for the Advancement of Science, **2011-Present.**
National Science Teaching Association, **2024-Present.**
American Association of Chemistry Teachers, **2024-Present.**