CHM 114: General Chemistry for Engineers

Arizona State University

Overview

Have you ever wondered what's inside your mobile phone case? Why batteries aren't lighter and have to be recharged? How different colors can be shown on your computer screen? Or why glass shatters when you hit it with a hammer? These, along with other questions of how atoms and molecules combine to make macroscopic materials with desired properties, are at the heart of countless challenges addressed by chemists and engineers every day. This course is not a standard introductory chemistry course. In this course, you will learn by doing, and you will be helped along the way with instant visual and audio feedback. You will simultaneously learn the language of chemistry and how to think like a chemist. The course introduces general chemistry topics and explains directly how these concepts are related to engineering. You will develop the language and chemistry skills necessary to work as an engineer in a team with chemists.

Course Prerequisites and Requirements

To be successful in this course, we recommend English language fluency and computer literacy. We also encourage you to make sure your laptop or desktop computer meets the technical requirements. MAT 170 Precalculus is strongly suggested as a prerequisite for success in this course.

What You'll Learn

- Solve engineering challenges using tools from chemistry
- Apply molecular ideas to understanding the properties of materials and functionality of modern devices
- Predict chemical and physical properties from molecular or material structures
- Evaluate suitability of chemicals and materials for applications like batteries or fuel cells based on chemical and physical properties

Transcript

This course appears on your transcript identically to how it appears on the transcript of an enrolled ASU student who has taken the course on one of ASU's campuses.

This course includes a lab and satisfies 4 credit hours toward the Natural Science - Quantitative (SQ) General Studies requirement at Arizona State University. It is strongly encouraged that you consult with your institution of choice to determine how these credits will be applied to their degree requirements prior to transferring your credit.

Exams and Grading

18% Quizzes (7)	28% Labs and Lab Questions	5% ALICE Activities
10% Midterm Exam	39% Final Exam	

Creators

Ian Gould

President's Professor and Associate Director of Outreach, Online and Communications, School of Molecular Sciences

Ian Gould is President's Professor and Associate Director of Outreach, Online and Communications in the School of Molecular Sciences at Arizona State University. He received his B.Sc., M.Sc., and Ph.D. Degrees in chemistry from the University of Manchester (UK). After a postdoctoral fellowship at Columbia University, he moved to the Eastman Kodak Company. In 1998, he joined the faculty of ASU where he teaches organic chemistry. Areas of expertise include organic geochemistry, chemical education, and organic mechanisms.

Anne Katherine Jones

Associate Professor and Associate Director of Academic Affairs, School of Molecular Sciences

Anne Jones is Associate Professor and Associate Director for Academic Affairs in the School of Molecular Sciences at Arizona State University. She received her B.S. in chemistry and mathematics from the University of the South and her D. Phil in Inorganic Chemistry from the University of Oxford (UK). Following post-doctoral research at the Humboldt University in Berlin, Germany and the University of Pennsylvania, she joined the faculty in the School of Molecular Sciences in 2017 where she teaches undergraduate and graduate courses in inorganic and biological chemistry. Areas of expertise include electrocatalysis, biological inorganic chemistry, and bioenergy.

Creators

Pamela Marks

Principal Lecturer,
School of Molecular Sciences

Pamela Marks is a Principal Lecturer in the School of Molecular Sciences at Arizona State University. She earned her B.A. in chemistry from St. Olaf College and her M.A. in inorganic chemistry from the University of Arizona. Since joining the ASU faculty in 1995, Pam has focused on teaching introductory chemistry in labs, traditional and non-traditional lecture courses, and online.

Peter Williams

Professor of Chemistry,
School of Molecular Sciences

Peter Williams is a Professor of Chemistry in the School of Molecular Sciences at Arizona State University. He obtained his BSc in Chemistry and a PhD in Physical Chemistry from the University of London, King's College (UK). Following a postdoctoral fellowship at Argonne National Laboratory and staff position at the Universities of Manitoba and Illinois, he joined the ASU faculty in 1981 where he teaches courses in introductory chemistry and bioanalytical chemistry. Areas of expertise include bioanalytical chemistry, mass spectrometry, and bioimaging.