

Program Learning Goals – Winter Quarter

Through your work in winter quarter, you will have the opportunity to:

1. Further develop an intentionally inclusive and anti-bias learning environment that is attentive to and supportive of the unique gifts and background of each student.
2. (Cross-Program Learning Goals)
 - a. Improve your ability to articulate and assume responsibility for your own work.
 - b. Strengthen your collaborative skills and the ability to respond in useful ways to the work of colleagues.
 - c. Improve your skills in clear communication of mathematical and scientific ideas, both orally and in writing.
 - d. Improve your ability to read technical textbooks with focus on developing conceptual understanding and procedural skills.
 - e. Improve your ability to read primary source scientific literature with a focus on applying subject matter knowledge and developing critical thinking skills.
3. (Chemistry Learning Goals)
 - a. Understand how chemical properties of elements can be predicted by theoretical models and how predictive models for reactions can be created based on measurable quantities such as reaction energies and concentrations (and how they change over time).
 - b. Learn about chemical reactions and their products in the context of laboratory and everyday phenomena.
 - c. Learn to use fundamental lab tools and apply these to investigate chemical and physical properties of solids, liquids, and gases.
 - d. Explore lab-based scientific inquiry through making a testable hypothesis, carrying out experiments, and data analysis with comparisons to literature and peer results.
4. (Mathematics Learning Goals)
 - a. Deepen your prerequisite understanding of derivatives and integrals and associated mathematical concepts such as functions, slopes, areas, limits, and sums.
 - b. Learn to evaluate indefinite, definite, and improper integrals using a variety of standard techniques (including substitution and parts).
 - c. Learn to apply derivatives, particularly in the context of the physical sciences, to rates of change, related rates, max/min problems, optimization, shapes of curves, and limits of indeterminate forms (l'Hospital's Rule).
 - d. Learn to apply integrals, particularly in the context of the physical sciences, to areas, volumes, arc lengths, average values, and differential equations.
5. (Physics Learning Goals)
 - a. Utilize the mathematical models that describe and explain motion in the natural world.
 - b. Understand that physics is based on a few key principles that can be applied to a wide range of natural phenomena.
 - c. Use the main ideas of classical mechanics, electricity and magnetism (electric and magnetic fields, their sources, and their interactions with matter), and thermodynamics to solve fundamental and applied problems.
 - d. Experience that physics is both a mathematical and an experimental science.
6. (Interdisciplinary Energy Project Learning Goals)
 - a. Apply and integrate knowledge from chemistry, mathematics, and physics to contexts outside textbooks and lab exercises, particularly energy.
 - b. Identify, quantify, and apply energy transformations.
 - c. Link energy transformations to societal impacts.

Credit Equivalencies – Winter Quarter

Calculus II (4 credits)

General Chemistry II w/ lab (6 credits)

University Physics II w/ lab (6 credits)