

USU General Education in the Physical Sciences

A general education in the physical sciences will teach students to:

- Understand science as a process and promote their ability to apply scientific methods of investigation.
- Have a fundamental understanding of the unifying principles of the physical sciences.
- Examine the historical contexts of science, the evolution of science, its impact on society, the impact of society on the physical sciences, and how society and science are linked.
- Evaluate the historical, social, and ethical contexts of science issues.

There are three levels of the curriculum: USU 1360: Integrated Physical Science; Breadth Physical Sciences (BPS) courses, and Depth Life and Physical Sciences (DSC) courses.

USU 1360 introduces students to a variety of disciplines in the physical sciences and covers a range of interdisciplinary topics.

BPS courses, unlike USU 1360, emphasize a particular discipline, giving students a broad and balanced perspective of its subfields and its methods. BPS courses, however, still cover a range of topics.

DSC courses also emphasize a particular discipline; however, unlike BPS courses, they may focus more narrowly on a particular question, or may confine themselves to ideas within a particular subfield.

Proposals for these courses will be evaluated according to the above criteria as well as the following rubric. The proposal memo should explain in detail—with reference to the syllabus—how the instructor intends to satisfy these criteria and achieve these outcomes. A DSC course will set a higher bar for achieving proficiency than a BPS course or USU 1360. In addition, to meet these goals, smaller courses may emphasize oral communication and information literacy skills more than larger courses.

Integrated Physical Sciences Rubric

<u>Criteria</u>	<u>Outcome 1</u>	<u>Outcome 2</u>	<u>Outcome 3</u>
Students will learn to:	The student who achieves proficiency will:	The student who approaches proficiency will:	The student who lacks proficiency will:
Understand how the enterprise of science works (i.e., erecting testable hypotheses, refining hypotheses, reproducible results, etc.)	Apply the basic structure and methodology of scientific enterprise.	Articulate the basic structure and methodology of scientific enterprise.	Be unable to articulate the basic structure and methodology of scientific enterprise.
Understand key laws, concepts and processes that govern physical systems.	Know the key laws and concepts, and is able to apply them to novice problems.	Know the key laws and concepts and can articulate them.	Not know the key laws and concepts beyond memorization.
Utilize quantitative methods to address a process or principle (i.e., computation, interpreting results (such as in a graph or table), understanding the meaning of accuracy, uncertainty, precision, and error).	Be able to make, read, understand and explain a graph, table, or a quantitative series of data, and apply that understanding to a problem.	Be able to make, read, and understand a graph, table, or a quantitative data.	Not be able to make, read, or understand a graph, table, or quantitative series of data.
Evaluate the credibility of various sources of information about science-related issues.	Assess the credibility of sources of scientific information, and critique source as it applies to a scientific issue.	Assess credible sources of scientific information, and can articulate why they are credible.	Not be able to assess credible sources for scientific information, or unable to determine credibility of sources.
Use written or visual communication to demonstrate knowledge of scientific findings.	Write and/or illustrate knowledge of a scientific idea or concept clearly, comprehensively, and concisely.	Write and/or illustrate knowledge of a scientific idea or concept.	Be unable to convey knowledge.
Examine the relationship of the science learned to societal issues (such as sustainability, etc...)	Apply science concepts and societal issues to the greater question of the course.	Articulate the relationship between science concepts and societal issues.	Be unable to recognize the links between social issues and scientific findings.