NSCI 141
Catalog Description:
Concurrent enrollment in or prior completion of MATH 110.
Basic concepts of motion, force, energy, chemical change, and their interactions. Intended for Liberal Studies majors.

OFFICE: HOLT 101B & 101D
OFFICE HOURS: Monday and Wednesday from 1-2PM & by appointment

STRUCTURE OF THE PSET COURSE:
This course is divided into lab and lecture. Lab will use PSET: Physical Science and Everyday Thinking, which is activity-based and discussion-oriented with four major goals:

1. **Physical Science Content:** To help you develop a deep understanding of physics and chemistry ideas that can be used to explain interesting phenomena, and are related to the ideas included in the elementary school science curriculum;

2. **Nature of Science:** To help you practice and develop an understanding of how knowledge is developed within a scientific community: that doing science involves using evidence and creative thinking, that knowledge is established through collaboration and consensus, and that science knowledge can change over time;

3. **Science pedagogy:** To help you develop your science pedagogy skills we will be reading selected articles on how we teach and learn and applying them to science learning scenarios.

4. **Learning about learning:** To help you become more aware of how your own science ideas change and develop over time, and how the structure of the learning environment and curriculum facilitate these changes.

The basic aim of the PSET format is to allow you to take charge of your own learning, with the instructor as a guide. During class you will spend most of your time performing experiments, working occasionally with computers, and discussing ideas with your classmates. We expect you to continue your learning at home through homework assignments, many involving use of the web. We hope you will find many of our teaching and learning strategies valuable and appropriate for you to use when you begin your teaching career.

The PSET curriculum is divided into the following chapters:

**Chapter 1:** Interactions and Energy
**Chapter 4:** Interactions and the Behavior of Gases
**Chapter 2:** Interactions and Forces
**Chapter 5:** Interactions and Physical Changes
**Chapter 3:** Interactions and Systems
**Chapter 6:** Interactions and Chemical Changes
The goal of each chapter is to have you develop a set of ideas that can be used to help explain phenomena that will be explored within that chapter, as well as to consider issues of learning science. There are three types of activities and homeworks within each chapter. The first several activities are called Developing Ideas activities. During these activities you will perform experiments to collect evidence in support of ideas that you will develop. The final activity in a Chapter is an Applying Ideas activity. In that activity you will compare your ideas with those developed by scientists, then apply the ideas to explain interesting phenomena. Sprinkled throughout the curriculum are a series of Learning About Learning activities, some done during class, most done for homework. During these LAL activities you are asked to think about your own learning, the learning of children and/or the learning of scientists (namely, how they develop scientific knowledge).

**STRUCTURE OF THE LAB ACTIVITIES**
Each individual activity consists of several sections with slightly different aims.

Throughout the activities you will be writing answers to questions on the activity sheets themselves. Three types of questions will be identified by small icons:

- **Prediction Question.** A chance for you to use your current thinking to anticipate what you think will happen. In each case, your prediction should be justified in terms of your current idea(s). This is a vital step in your learning and should not be “glossed over”. If the results of an experiment do not agree with your prediction DO NOT go back and change it – this is valuable evidence of how your ideas are evolving.

- **Observation Question.** A place for you to record the results of experiments. These results may take several forms, including describing observations, sketching diagrams, or recording numerical values in a table.

- **Making Sense Question.** This is where you get to interpret the results of experiments in terms of your ideas. Do the results agree with your predictions, or not? If so, they provide evidence to support your ideas. If not, maybe your ideas need to be modified.

**STRUCTURE OF THE LECTURE ACTIVITIES**
During lecture we will discuss the lab activities and how these help us to understand what energy is. We will also discuss selected readings designed to help us understand student thinking and effective science pedagogy. You will need to bring your iClicker.

**REQUIRED MATERIALS:**
*Physical Science and Everyday Thinking* textbook is available from the campus bookstore. You will need an iClicker, available from the bookstore. You will need to bring the iClicker to lecture. You will need to bring your book to lab. It is highly recommended that you have a 3-ring binder to keep your materials. (Freecycled ones in BMU 301.)

**ATTENDANCE AND PARTICIPATION:**
You are responsible for your own learning in this class. By engaging in discussions with your group members, by actively participating in whole class discussions, and by performing interesting experiments, you will develop with your classmates a set of ideas.
Similar to the way in which scientists develop ideas, your ideas will be based on evidence gathered from the experiments you do. At appropriate times, you will be able to compare your ideas with those developed by scientists. It is expected that except for some special jargon, the ideas you develop with the class should be quite similar to the scientists' ideas. Because you will play such an important role in your own learning, and especially the learning of your classmates, you are expected to come to class on time every class period and participate throughout the period.

**You may miss two classes for any reason. After those two absences, we will deduct a letter grade from your final grade for each absence (an A would become an A-, for example).** If you must miss class for health or because you are a caregiver, and would like to receive credit for attendance, you must email me before class to be excused and work through the lab on your own and turn in the Summarizing Questions. I only excuse absences for health and emergency reasons. Please make every effort to attend every class.

**HOMEWORK:**
Homework will be assigned almost every lab period and, unless otherwise stated, will be due at the beginning of the following lab period. **No credit will be given if the homework is not turned in by then.** Each regular assignment is worth 3 points and will be graded according to whether you provided complete and reasonable answers to all the questions.

For certain lectures you will be assigned an article to read and reflect on. Reflections must be completed prior to class through blackboard. Each reading and its associated reflection will be worth 2 points.

**READINGS:**
Some of the lecture sections assign readings. These readings are to be completed prior to class. For each reading students should post on the discussion forum with three things: (1) something you agreed with, (2) something you found confusing, and (3) something you found provocative or controversial.

**QUIZZES & EXAMS**
At the end of each chapter will be an online quiz. These are multiple choice and will require you to have completed the reading and understood the material from the chapter. **You are encouraged to discuss the quiz with your classmates before answering the questions.**

There will be one major exam at the end of the term. Since ideas build over time, the exam is cumulative. There will be both a lab portion, where your group will work together to perform experiments and analyze the results (similar to lab on other days), and an individual portion.

Your final will be given in lab. Finals schedule can be found at http://www.csuchico.edu/apss/schedule/final_exams/final_exam_schedule_matrix.pdf
GRADING CRITERIA AND DATES:

<table>
<thead>
<tr>
<th>Course component</th>
<th>Point value</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 Quiz</td>
<td>10 points</td>
<td>Sept. 14</td>
</tr>
<tr>
<td>Chapter 2 Quiz</td>
<td>10 points</td>
<td>Sept. 28</td>
</tr>
<tr>
<td>Chapter 3 Quiz</td>
<td>10 points</td>
<td>Oct. 12</td>
</tr>
<tr>
<td>Chapter 4 Quiz</td>
<td>10 points</td>
<td>Oct. 26</td>
</tr>
<tr>
<td>Chapter 5 Quiz</td>
<td>10 points</td>
<td>Nov. 16</td>
</tr>
<tr>
<td>Chapter 6 Quiz</td>
<td>10 points</td>
<td>Dec. 7</td>
</tr>
<tr>
<td>Final exam</td>
<td>70 points</td>
<td>Dec. TBD</td>
</tr>
<tr>
<td>Homework (22)</td>
<td>66 points</td>
<td>daily, in lab</td>
</tr>
<tr>
<td>Course reading reflections</td>
<td>20 points</td>
<td>periodically</td>
</tr>
<tr>
<td>Total</td>
<td>216 total</td>
<td></td>
</tr>
</tbody>
</table>

GRADING SCALE:

<table>
<thead>
<tr>
<th>Cut-off for a given grade:</th>
<th>92 % A</th>
<th>90% A-</th>
</tr>
</thead>
<tbody>
<tr>
<td>88 % B+</td>
<td>82 % B</td>
<td>80 % B-</td>
</tr>
<tr>
<td>78 % C+</td>
<td>72 % C</td>
<td>70 % C-</td>
</tr>
<tr>
<td>68 % D+</td>
<td>62 % D</td>
<td>below 62% F</td>
</tr>
</tbody>
</table>

ACADEMIC INTEGRITY:
The students, faculty, administrators, and staff of CSU, Chico are committed to a culture of honesty in which members of the community accept responsibility to uphold academic integrity in all they say, write, and create.

AMERICANS WITH DISABILITIES ACT:
If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

PLAGIARISM:
For additional information about when and how to cite others work or ideas, please visit the university website: http://library.acadiau.ca/tutorials/plagiarism/