PHYS 184: PHYSICS OF ENERGY AND THE ENVIRONMENT

In Workflow

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Approval Path

1. 2026-09-15T21:10:02Z
   Mikkel Jensen (mikkel.jensen): Approved for PHYS Committee Chair
2. 2026-09-15T22:22:19Z
   Michael Ray (ray): Approved for PHYS Chair
3. 2026-10-08T01:45:29Z
   Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. 2026-10-08T15:32:37Z
   Chris Taylor (ctaylor): Approved for NSM Dean

History

1. Mar 7, 2025 by Janett Torset (torsetj)

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Changes proposed by: Mikkel Jensen (218650862)

Contact(s):

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Catalog Title:
Physics of Energy and the Environment

Class Schedule Title:
Phys of Energy and Env

Academic Group: (College)
NSM - Natural Sciences & Mathematics

Academic Organization: (Department)
Physics and Astronomy

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2027 (2027/2028 Catalog)

Subject Area: (prefix)
PHYS - Physics

Catalog Number: (course number)
184

Course ID: (For administrative use only.)
203518

Units:
3

Is the ONLY purpose of this change to update the term typically offered or the enforcement of existing requisites at registration?
No

In what term(s) will this course typically be offered?
Fall, Spring

Does this course require a room for its final exam?
Yes, final exam requires a room

This course complies with the credit hour policy:
Yes

Justification for course proposal:
The course is a GE area 5 upper-division course, and so is being updated and submitted for review per the recently approved GE Program policy. The course LOs and assessment strategies have been updated to match the new policy, and an updated syllabus is provided.
The course predates the current Curriculum Workflow system, and so LOs are also being introduced into the Form A with this proposal, and the missing Form A information is being provided through this proposal.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)
Our society requires and consumes energy. In this course, students will gain an understanding of the wide variety of our energy sources and how the energy is generated, distributed, and stored. We will examine the large scale and small scale role that energy plays in society and the impact that energy policy and practices have on the environment.

Are one or more field trips required with this course?
No

Fee Course?
No

Is this course designated as Service Learning?
No

Is this course designated as Curricular Community Engaged Learning?
No

Does this course require safety training?
No

Does this course require personal protective equipment (PPE)?
No

Does this course have prerequisites?
Yes

Prerequisite:
Completion of lower-division GE Area 5A.

Prerequisites Enforced at Registration?
Yes

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

Course Component(s) and Classification(s):
Lecture

Lecture Classification
CS#02 - Lecture/Discussion (K-factor=1WTU per unit)
Lecture Units
3

Is this a paired course?
No

Is this course crosslisted?
No

Can this course be repeated for credit?
No

Can the course be taken for credit more than once during the same term?
No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Describe the physical principles underlying major energy sources and the methods used to convert them into electricity and other useful forms of energy.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
2	Explain how human uses of natural resources and energy affect environmental systems.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
3	Compare energy sources and patterns of energy use, including their benefits, limitations and environmental impacts.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
4	Evaluate evidence-based strategies for conserving energy and natural resources, protecting environmental systems and supporting a more sustainable future.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
5	Explain and apply core ideas and models concerning physical systems and mechanisms, citing critical observations, underlying assumptions and limitations.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
6	Describe how scientists create explanations of natural phenomena based on the systematic collection of empirical evidence subjected to rigorous testing and/or experimentation.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
7	Access and evaluate scientific information, including interpreting tables, graphs and equations.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)
8	Recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public and ethical concern.	Homework, exams, writing assignments (essays, discussion posts, summaries, etc.)

Attach a list of the required/recommended course readings and activities:
184_F26_Morris_revised.pdf

Is this course required in a degree program (major, minor, graduate degree, certificate?)
No

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Knowledge of human cultures and the physical and natural world
Intellectual and practical skills
Personal and social responsibility

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Is this a General Education (GE) or Graduation Requirement (GR) course or is it being considered for GE/GR?

Is this a General Education (GE) course or is it being considered for GE?

Yes

In which GE area(s) does this apply?

5A. Physical Science

Which GE objective(s) does this course satisfy?

Gain a general understanding of current theory, concepts, knowledge, and scientific methods pertaining to the nature of the physical universe, ecosystems, and life on this planet.

Attach Course Syllabus with Detailed Outline of Weekly Topics:

184_F26_Morris.pdf

Syllabi must include: GE area outcomes listed verbatim; catalog description of the course; prerequisites, if any; student learning objectives; assignments; texts; reading lists; materials; grading system; exams and other methods of evaluation.

Will more than one section of this course be offered?

Yes

Provide a description of what would be considered common to all sections and what might typically vary between sections:

All sections will address all CLOs as listed above. Instructors are free to address the CLOs per their academic freedom, including exact choice of assessments, textbook, etc.

Please write a statement indicating the means and methods for evaluating the extent to which the objectives of the GE Area(s) and any writing requirements are met for all course sections:

It is the responsibility of the Department Chair to ensure that all instructors are provided with the LOs for courses. Instructor compliance is routinely reviewed by the Department Retention, Tenure, and Promotion (RTP) Committee.

What steps does the department plan to take to ensure that instructors comply with the respective category criteria and who is responsible?

It is the responsibility of the Department Chair to ensure that all instructors are provided with the LOs for courses. Instructor compliance is routinely reviewed by the Department Retention, Tenure, and Promotion (RTP) Committee.

General Education - Area 5A: Physical Science

Section 1.

"Indicate in written statements how the course meets the following criteria for Area 5A. Relate the statements to the course syllabus and outline. Be as succinct as possible.

General Criteria:

Is an introductory course with no college level prerequisites.

The GE policy states that GE courses “usually have no prerequisites” because they are intended for students without specialized disciplinary preparation, but also states that "Upper division courses may be somewhat narrower in scope than lower division courses and they may require more specialized preparation" (p.19).
As such, the policy does not prohibit UD GE courses having college prerequisites. Since PHYS 184 requires some quantitative and subject-specific preparation, as described by the GE policy, the course requires the completion of the lower-division physical science GE area, in addition to the Area A completion and sophomore status required by all UD GE courses.

Emphasizes general principles and concepts having a broad range of application and is not restricted to specialized topics.

The course emphasizes general scientific principles, and though the course is focused on energy and the environment, the methods for analyzing and studying the topics apply generally and not only in physics.

Introduces students to one or more of the disciplines whose purpose is to acquire knowledge of the physical universe.

The course introduces students to the physics of energy, energy use, and its relation to the physical environment.

Specific Criteria:

A student will be able to explain and apply core ideas and models concerning physical systems and mechanisms, citing critical observations, underlying assumptions and limitations.

Students will be able to explain energy sources, energy use, and its impact on the environment based in a physical model of these systems.

A student will be able to describe how scientists create explanations of natural phenomena based on the systematic collection of empirical evidence subjected to rigorous testing and/or experimentation.

The investigations into the mechanisms of energy extraction and energy use, as well as into the impact of human energy and resource use, are all grounded in scientific data, and students learn how scientists use scientific reasoning and data to arrive at the conclusions taught in the course. Students also practice engaging in this scientific reasoning themselves as they investigate energy and environmental systems in the course.

A student will be able to access and evaluate scientific information, including interpreting tables, graphs and equations.

The course requires students to conduct quantitative reasoning, including reading graphs and tables to reach conclusions about energy use.

A student will be able to recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public, and ethical concern.

Students investigate scientific sources as part of the course and learn the scientific underpinnings of human energy and resource use and its impact on the environment.

Includes a writing component described on course syllabus

I) If course is lower division, formal and/or informal writing assignments encouraging students to think through course concepts using at least one of the following: periodic lab reports, exams which include essay questions, periodic formal writing assignments, periodic journals, reading logs, other. Writing in lower division courses need not be graded, but must, at a minimum, be evaluated for clarity and proper handling of terms, phrases, and concepts related to the course.

2) If course is upper division, a minimum of 1500 words of formal, graded writing. [Preferably there should be more than one formal writing assignment and each writing assignment (e.g. periodic lab reports, exams which include essay questions, a research/term paper etc.) should be due in stages throughout the semester to allow the writer to revise after receiving feedback from the instructor. Include an indication of how writing is to be evaluated and entered into course grade determination.]

The course addresses the 1500 words of formal, graded writing through periodic writing assignments (essays, discussion prompts, etc.) which are spread throughout the semester.

Section 2.

If you would like, you may provide further information that might help the G.E. Course Review Committee understand how this course meets these criteria and/or the G.E. Program Objectives found in the CSUS Policy Manual, General Education Program, Section I.B.

n/a

Key: 14351