

PHYS 107: CONCEPTUAL PHYSICS AND SCIENTIFIC INQUIRY

In Workflow

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Approval Path

1. Sun, 17 Mar 2024 21:18:40 GMT
Mikkel Jensen (mikkel.jensen): Approved for PHYS Committee Chair
2. Tue, 19 Mar 2024 17:53:04 GMT
Chris Taylor (ctaylor): Approved for PHYS Chair
3. Wed, 03 Apr 2024 22:24:43 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Wed, 17 Apr 2024 20:52:42 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

Date Submitted: Mon, 04 Mar 2024 03:09:47 GMT

Viewing: PHYS 107 : Conceptual Physics and Scientific Inquiry

Last edit: Mon, 04 Mar 2024 03:09:46 GMT

Changes proposed by: Vera Margoniner (210759745)

Contact(s):

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Catalog Title:

Conceptual Physics and Scientific Inquiry

Class Schedule Title:

Conceptl Physics+Inquiry

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 2024 (2024/2025 Catalog)

Subject Area: (prefix)

PHYS - Physics

Catalog Number: (course number)

107

Course ID: (For administrative use only.)

158366

Units:

4

Is the only purpose of this change to update the term typically offered or the enforcement of existing prerequisites 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:

1 - Include Student Learning Outcomes and update the course description.

2 - Drop the CHEM 106 pre and corequisite. We want students to take PHYS 107 earlier in their careers at Sac State to increase the chance they will decide on an emphasis in Natural Sciences.

3 - Remove the prerequisite registration enforcement because students often take equivalent courses that are not automatically flagged as acceptable substitutions. Prof. Van Gaasbeck, Director of Liberal Studies, explains that "there are a number of courses that are articulated as meeting the subject matter program for Liberal Studies, but that are not specifically equivalent to BIO 7, GEOL 8/8T and MATH 17. Sometimes, there are even sequences of courses that meet the equivalents. For example, some students may never complete MATH 17, but a two-course sequence at the community colleges has been approved as meeting the subject matter area by the Math Department. The same goes for BIO7 and GEOL 8 - there are community college courses that meet the equivalent requirements for the major. Approval of these equivalencies is not the same as approval of a prerequisite from the Registrar's perspective." Besides, the physics department agrees that BIO 7, GEOL 8/8T, and CHEM 106 are unnecessary prerequisites that get in the way of having students take PHYS 107 earlier in their careers. Mathematics is important, but the reality is that MATH 17 isn't enough anyway, and PHYS 107 takes the time to cover the necessary concepts.

4 - Fix a workload issue. Currently, PHYS 107 is a 4-unit class with a 4.6-WTU. It has two components: two units of Discussion (CS#04, K-factor=1 WTU per unit) and two units of Activity (CS#07, K-factor=1.3 WTU per unit). The class meets for 150 minutes twice a week. Faculty feels that PHYS 107 closely resembles the Phys 11A and 11C lecture and laboratory structure and should be compensated the same. This proposal changes PHYS 107 into three Discussion units (CS#04, K-factor=1 WTU per unit) and 1 unit of Laboratory (CS#16, K-factor=2 WTU per unit). It will be a 4-unit class with a 5-WTU.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)

Investigation of physics concepts included in the Next Generation Science Standards for K-8 students. Topics include science and engineering practices, student-centered and equitable pedagogical practices, the structure of matter, forces and motion, energy, electricity, and magnetism. Emphasizes hands-on cooperative learning, engaging students in scientific inquiry by posing testable scientific questions, conducting experiments, and analyzing and presenting findings to their peers. Weekly discussion and laboratory sessions.

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:

BIO 7, GEOL 8, MATH 17.

Prerequisites Enforced at Registration?

No

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):Discussion
Laboratory**Discussion Classification**

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

Discussion Units

3

Laboratory Classification

CS#16 - Science Laboratory (K-factor=2 WTU per unit)

Laboratory Units

1

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	Locate, read, and explain the NGSS K-8 Physical Science Performance Expectations (PEs).	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.
2	Differentiate the three dimensions of NGSS: a. disciplinary core ideas (DCIs), b. science and engineering practices (SEPs), c. and the crosscutting concepts (CCCs).	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.
3	Explain the Physical Science DCIs relevant to K-8 students.	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.
4	Describe the common student difficulties and misconceptions associated with the Physical Science DCIs.	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.

5	Apply the eight SEPs in a context that is relevant to K-8 students, i.e.: a. Observe physical science phenomena and ask questions about them. b. Develop and use models. c. Plan and carry out investigations. d. Analyze and interpret data. e. Apply mathematics and computational thinking. f. Construct explanations that are based on evidence (refine models). g. Communicate their learning process and the science behind observed phenomena.	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.
6	Recognize the CCCs and start to understand the overarching ideas that connect all fields of science.	Summative assessment will consist of exams and a lesson study project. Formative assessment will be done in class and through homework assignments.
7	Design and teach a lesson that: a. Covers a PE to be determined by the instructor (addressing a relevant DCI and including at least one SEP and one CCC), b. is inquiry-based, c. is motivated by a driving question and/or natural phenomena, d. includes clear student learning outcomes and a way to assess them.	Summative assessment will be based on the lesson study project. Formative assessment will be done in class and through homework assignments.

Attach a list of the required/recommended course readings and activities:

Phys 107 Syllabus (Spring 2024).pdf

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:

Programs:

BA in Liberal Studies

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:

- Competence in the disciplines
- Knowledge of human cultures and the physical and natural world
- Intellectual and practical skills
- Personal and social responsibility
- Integrative learning

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

GE Course and GE Goal(s)

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

No

Please attach any additional files not requested above:

Kristin Van Gaasbeck (Liberal Studies) support.pdf
PHYS 107 Changes (Chemistry support).pdf

Key: 3902