

Form: "Seven Year Implementation Plan Template"

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Participating Area: Undergrad Physics and Physical Sciences

Seven Year Implementation Plan Template

(REQUIRED) Next APR Year

2022

(REQUIRED) Mission Statement

Enter your Mission Statement here

It is the mission of the physics program

- to offer a high quality major undergraduate degree, and to foster a lifelong interest in science.
- to develop in our students an understanding of the fundamentals and modern applications of physics, including the terminology, core concepts, and methodologies of the discipline.
- to develop each student's analytical thinking, problem solving techniques, and laboratory abilities.
- to prepare our undergraduate students for graduate school, a career in scientific research and development, or industrial work.
- to serve students in the rest of the university through high quality supplementary and support courses for other sciences and pre-professional programs.
- to provide majors and non-majors alike with an appreciation for the way the physical world works.

Program Learning Outcomes

PLO 1

The student will master material in advanced courses, which presuppose understanding of physics at a more fundamental level.

PLO 2

The student will think critically in analysis of problems in physics, including appropriate use of advanced mathematical tools.

PLO 3

The student will demonstrate the ability to work effectively in a laboratory environment, including the use of advanced technologies.

PLO 4

The student will be satisfied with the overall quality of their physics education.

PLO 5

The student will have a strong command of the nature of oral and written communication and of intra-group interactions in the traditions of physics.

PLO 6

The student will have the skill necessary to pursue a career in physics or a related field, or to enter a graduate program.

PLO 7

No answer specified

PLO 8

No answer specified

PLO 9

No answer specified

PLO 10

No answer specified

Program Maintenance Outcomes

PMO 1

More effectively guiding students into careers after graduation from CSU Stanislaus.

PMO 2

Immediate search for a full time lecturer to cover unassigned classes and prepare to search a tenure-track assistant professor replacing Dr. Ian Littlewood who is current FERPing and will be retired in the Fall of 2020.

PMO 3

Replacement of the two faculty who are currently FERPing.

PMO 4

No answer specified

PMO 5

No answer specified

PMO 6

No answer specified

PMO 7

No answer specified

PMO 8

No answer specified

Program Learning Outcome (PLO)

PLO 1

APR Cycle Year

(1-7)

3

Assessment Method/ Data Sources

We will assess all of our upper division courses required for the B.S. in year 3 of the cycle, namely

Phys 3010 Introduction to Mathematical Physics I

Phys 3100 Classical Mechanics

Phys 3320 Electricity and Magnetism I

Phys 3520 Modern Physics and Quantum Mechanics

Phys 4102 Experimental Physics

Phys 4250 Analog and Digital Electronics

Phys 4510 Quantum Mechanics I

Phys 4530 Thermal and Statistical Physics

We will use the Problem Solving Grading Rubric to assess this program learning outcome.

Assessment Process: Collection/ Analysis/ Discussion

We will collect the data from the courses listed above for the first 3 years of the cycle, and analyze the data as follows:

1. For each individual course, we will use cumulative data for the first three years in order to have a larger pool of students. This will allow us to gain a more meaningful statistical analysis of the data.
2. We will then combine the data from all courses over this 3 year period, and obtain an average success rate for this program learning outcome.
3. We will discuss whether it is necessary to modify the problem solving rubric or whether we feel the rubric is effective in capturing the essence of the data.

Resources Needed (If Applicable)

No resources needed.

PLO 2

APR Cycle Year

(1-7)

3

Assessment Method/ Data Sources

We will assess all of our upper division courses required for the B.S. in year 3 of the cycle, namely

Phys 3010 Introduction to Mathematical Physics I

Phys 3100 Classical Mechanics

Phys 3320 Electricity and Magnetism I

Phys 3520 Modern Physics and Quantum Mechanics

Phys 4102 Experimental Physics

Phys 4250 Analog and Digital Electronics

Phys 4510 Quantum Mechanics I

Phys 4530 Thermal and Statistical Physics

We will use the Problem Solving Grading Rubric to assess this program learning outcome.

Assessment Process: Collection/ Analysis/ Discussion

We will collect the data from the courses listed above for the first 3 years of the cycle, and analyze the data as follows:

1. For each individual course, we will use cumulative data for the first three years in order to have a larger pool of students. This will allow us to gain a more meaningful statistical analysis of the data.
2. We will then combine the data from all course over this 3 year period, and obtain an average success rate for this program learning outcome.
3. We will discuss whether it is necessary to modify the problem solving rubric or whether we feel the rubric is effective in capturing the essence of the data.

Resources Needed (If Applicable)

No resources needed.

PLO 3

APR Cycle Year

(1-7)

4

Assessment Method/ Data Sources

We will assess the two upper division laboratory courses required for the B.S. in year 4 of the cycle, namely

Phys 4102 Experimental Physics

Phys 4250 Analog and Digital Electronics

We will develop a Laboratory Report Grading Rubric to assess the data. Students in these courses are required to set up and conduct physics experiments, and write detailed reports on their findings.

The laboratory grading rubric will be designed to capture the essential learning outcomes of these reports.

Assessment Process: Collection/ Analysis/ Discussion

We will collect the data from the courses listed above for the first 4 years of the cycle, and analyze the data as follows:

1. For each individual course, we will use cumulative data for the first four years in order to have a larger pool of students. This will allow us to gain a more meaningful statistical analysis of the data.
2. We will then combine the data from all course over this 4 year period, and obtain an average success rate for this program learning outcome.
3. We will discuss whether it is necessary to modify the laboratory report rubric or whether we feel the rubric is effective in capturing the essence of the data.

Resources Needed (If Applicable)

We will develop a Laboratory Report Grading Rubric to assist us in assessing the data for the learning outcome.

PLO 4

APR Cycle Year

(1-7)

6

Assessment Method/ Data Sources

We will use the Online Exit Survey developed by the department to help us assess the overall satisfaction of our graduates with the program. We will create a database of responses to the exit survey, and collect data annually and add it to the database.

Assessment Process: Collection/ Analysis/ Discussion

A database of responses to the Exit Survey will be built. Data will be added to the database on an annual basis. In year 6 of the cycle, we will analyze the total response pool and discuss the findings to determine the overall satisfaction rating of our graduates. We will also analyze the satisfaction rating on a yearly basis and discuss if any trends are emerging.

Resources Needed (If Applicable)

No resources needed.

PLO 5

APR Cycle Year

(1-7)

4

Assessment Method/ Data Sources

We will assess the two upper division laboratory courses required for the B.S. in year 4 of the cycle, namely

Phys 4102 Experimental Physics

Phys 4250 Analog and Digital Electronics

Phys 4910 Spectroscopy

We will develop a Laboratory Report Grading Rubric to assess the data. Students in these courses are required to set up and conduct physics experiments, and write detailed reports on their findings.

The laboratory grading rubric will be designed to capture the essential learning outcomes of these reports.

In order to assess oral communication of students, currently Phys 4910 requires students to present their projects. We will review the current oral communication rubric and work with the university oral communicator rubric team led by Prof. Chris Claus to improve the assessment.

Assessment Process: Collection/ Analysis/ Discussion

We will collect the data from the courses listed above for the first 4 years of the cycle, and analyze the data as follows:

1. For each individual course, we will use cumulative data for the first four years in order to have a larger pool of students. This will allow us to gain a more meaningful statistical analysis of the data.
2. We will then combine the data from all course over this 4-year period, and obtain an average success rate for this program learning outcome.
3. We will discuss whether it is necessary to modify the laboratory report rubric or whether we feel the rubric is effective in capturing the essence of the data.

Resources Needed (If Applicable)

We will develop a Laboratory Report Grading Rubric to assist us in assessing the data for the learning outcome.

PLO 6

APR Cycle Year

(1-7)

5

Assessment Method/ Data Sources

We will build a database of our graduates, and keep track of their place of first employment after graduation, or the graduate school attended. We will collect data for the first 5 years of the cycle.

Assessment Process: Collection/ Analysis/ Discussion

We will collect data on all of our graduates with the following information:

1. Place of first employment after graduation
2. Graduate school attended, field of study, and graduation date.

We will analyze the data to compare the number of students attending graduate school versus employment, and to evaluate the type of employment gained.

We will attempt to keep track of the students in graduate school, in an effort to monitor their progress towards successful completion of their graduate degree, as well as the number of years to achieve completion. We will determine if the students left CSU Stanislaus sufficiently prepared for graduate school.

Resources Needed (If Applicable)

No resources needed.

PLO 7

APR Cycle Year

(1-7)

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No answer specified

PLO 8

APR Cycle Year

(1-7)

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No answer specified

PLO 9

APR Cycle Year

(1-7)

5

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No answer specified

PLO 10

APR Cycle Year

(1-7)

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No resources needed.

Program Maintenance Outcome (PMO)

PMO 1

APR Cycle Year

(1-7)

Assessment Method/ Data Sources

We will use the data collected as part of PLO 6 to determine if our students are receiving sufficient guidance on the next step after graduation. We will attempt to encourage our graduates to re-visit campus and speak with our current students about the career opportunities that were available to them, the challenges they faced, and the strategies they used to overcome obstacles and be successful after graduation from CSU Stanislaus.

Assessment Process: Collection/ Analysis/ Discussion

We will use data collected from PLO 6 to determine if students are receiving effective guidance on how to proceed after graduation. We will analyze completion time for graduate programs, time to secure first employment after graduation from CSU Stanislaus, and after graduation from graduate school.

Resources Needed (If Applicable)

No answer specified

PMO 2

APR Cycle Year

1

Assessment Method/ Data Sources

We will determine if approval has been given to hire a full-time lecturer to cover the shortfall faced because of the FERPing of two faculty members.

Assessment Process: Collection/ Analysis/ Discussion

We will determine if approval has been given to hire a full-time lecturer to cover the shortfall faced because of the FERPing of two faculty members.

Resources Needed

Due to the retirement of Mr. Phil Rojas, we have a temporary instructional technician to serve the department before June 7th, 2019. The immediate search for a permanent instructional technician position to replace Mr. Phil Rojas is needed. The Department also needs to search for a full time lecturer to teach unassigned classes. Also, Prof. Ian Littlewood will be completing his FERP in May of 2020. The search for hiring a tenure-track assistant professor to replace Dr. Ian Littlewood’s position is also required. We may need

another tenure-track position when Dr. Rose Zhang is retired. This position will concentrate on developing our Physical Sciences and Astronomy programs.

PMO 3

APR Cycle Year

3

Assessment Method/ Data Sources

We will determine if approval is forthcoming to hire full-time faculty replacements for the two faculty recently retired as part of FERPing. One faculty has FERPed in Fall 2015, the other in Fall 2018. In order to maintain the effectiveness of the program, with a diverse range of research interests, we need to have approval for faculty replacements in a timely manner so that an effective round of applicant can be screened.

Assessment Process: Collection/ Analysis/ Discussion

We are expecting the approval to hire full-time lecturer this semester and two tenure-track replacements in near future for the two faculty recently retired as part of FERPing. One faculty has FERPed in Fall 2015, the other in Fall 2018. In order to maintain the effectiveness of the program, with a diverse range of research interests, we need to have approval for faculty replacements in a timely manner so that an effective round of applicant can be screened. A solid case will be made to argue for the urgency of these replacements in a timely manner as the faculty members exit their FERPing period. In order to maintain the current levels of student success in physics program, a core full-time faculty is needed.

Resources Needed (If Applicable)

Full-time faculty replacement for Dr. Ian Littlewood who has FERPed in Fall 2015.

Full-time faculty replacement for Dr. Rose Zhang who has FERPed in Fall 2018.

PMO 4

APR Cycle Year

No answer specified

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No answer specified

PMO 5

APR Cycle Year

No answer specified

Assessment Method/ Data Sources

No answer specified

Assessment Process: Collection/ Analysis/ Discussion

No answer specified

Resources Needed (If Applicable)

No answer specified