

Physics AS-T Midterm Review 2020-21 Latest Version

Instructional Program Review for all programs - full, midterm and CTE

General Information

General Information : Version by **Zhao, Jiaxin** on **10/19/2020 18:26**

| Program | Learning Area | Author(s) | Academic Year |
|--------------|------------------|-------------|---------------|
| Physics AS-T | Math and Science | Jiaxin Zhao | 2020-2021 |

Personnel

Personnel : Version by **Zhao, Jiaxin** on **10/19/2020 18:28**

| Number of full-time certificated faculty | Number of part-time certificated faculty | Number of full-time classified staff | Number of part-time classified staff | Number of administrators/classified managers |
|--|--|--------------------------------------|--------------------------------------|--|
| 1 | | 1 | | 1 |

Previous Program Review

Previous Program Review : Version by **Zhao, Jiaxin** on **10/20/2020 08:28**

| Goal from Previous Review | Is the goal met, partially met, or not met? | Please provide an update on this goal. |
|---|---|--|
| Accomplish curriculum revision and program evaluation. Ensure curriculum complies with SB1440 transfer requirements. | Met | CORs are updated following the 5-year cycle and comply with SB1440 transfer requirements. Student Course and Program Learning Outcome assessment are performed according to college assessment cycle. |
| Increase/maintain adjunct instructor pool. | Not met | PHYSICS 002B class in the Spring Semester is not offered because we can't find an adjunct instructor for it. Need to contact local business in physics and engineering and local graduate schools via mails and emails to let qualified individuals know of possible teaching opportunities. |
| Maintain/increase program enrollment by 5% each year. | Partially met | Unduplicated head count increased by more than 5% two years ago and slightly dropped last year. |
| Maintain/increase course success rate by 5% each year. | Partially met | Course success rate increased by 5% two years ago and stayed about the same last year. The rate for the past two years are above the Institutional Set Standard. |
| Maintain/increase program success rate and increase number of students transferred by 5% each year. | Partially met | Number of students transferred increased two years ago but dropped last year. The number fluctuated slightly around 5. |

Program Update (MIDTERM REVIEW ONLY)

Program Update : Version by **Zhao, Jiaxin** on **10/20/2020 08:28**

| Findings -What are the actual quantifiable outcomes compared to those listed in your original program review goals | Analysis -Your interpretation of the results (why the activities were successful, or not successful, in achieving the goal) | Actions-Based on the Findings and Analysis, what is the next step(s) to program improvement? | Additional Resources - Please list any additional resources (Faculty, Non-Faculty, Technology/Equipment, Professional Development, or Facilities) you will need to accomplish the activity. Specific details will be outlined in the Resource Request section |
|--|---|--|---|
| | | | |

| Findings -What are the actual quantifiable outcomes compared to those listed in your original program review goals | Analysis -Your interpretation of the results (why the activities were successful, or not successful, in achieving the goal) | Actions-Based on the Findings and Analysis, what is the next step(s) to program improvement? | Additional Resources - Please list any additional resources (Faculty, Non-Faculty, Technology/Equipment, Professional Development, or Facilities) you will need to accomplish the activity. Specific details will be outlined in the Resource Request section |
|--|---|---|---|
| The course success rate for the past two years are increased to above 70%, meeting the college Institutional Set Standard. | The first math class in the Physics AS-T program, Math 001A is traditionally the class that has the lowest course success rate, frequently below 50%. For the past two years, the success rate for this class is increased to above 60%. This might be due to more offering of this course and it is offered every semester now. If a student fails this course for the first time, he/she does not need to wait for another year to take this class again. By taking the class in consecutive semesters, a student increases the chance to pass the class in the second try. After students pass this first math class, the course success rates in other courses of this program are much higher, with second year courses posting course success rates above 90%. | The work need to be continued to maintaining the overall program course success rate above 70% by: maintaining the current course offering of Math 001A in each semester so students can retake it quickly; utilizing the funding from NSF S-STEM CORES grant to provide tutors and SIs for the Math 001A class to further improve the course success rate. | A lab technician is desired with shared responsibilities among Physics, Chemistry, and Biology labs. A part-time faculty is needed to cover some of the physics classes. |

Outcomes and Performance

CSLO Performance : Version by Zhao, Jiaxin on 10/20/2020 08:12

| CSLO | Expected Performance | CSLO Performance |
|---|----------------------|------------------|
| PHYSICS002A - Thermodynamicsoptics and Modern Physics | | |
| PHYSICS002A CSLO 1: Students will be able to identify physical properties and their units, and convert between British and SI unit systems. | 100.00% | 40.48% |
| PHYSICS002A CSLO 2: Students will be able to perform vector analysis of projectile motion, draw free-body diagrams, and apply Newtonian Mechanics on linear motion of point mass, rotational motion, and equilibrium of rigid body. | 100.00% | 59.52% |
| PHYSICS002A CSLO 3: Students will be able to solve problems involving work and energy, momentum and center of mass, and apply conservation laws of energy and momentum. | 100.00% | 97.62% |
| PHYSICS002A CSLO 4: Students will be able to identify different thermodynamic processes and apply ideal gas laws and first and second laws of thermodynamics to solve problems involving heat transfer and heat engines. | 100.00% | 71.43% |
| PHYSICS002A CSLO 5: Students will be able to acquire, analyze and present real-world experimental data with appropriate use of units, significant figures, tables and figures, and relate the results of experimental data to the physical concepts tested. | 100.00% | 59.52% |
| PHYSICS002B - Elect. Mag. Optics & Modern Physics | | |

Average CSLO Performance

68.33%

51.82%

| CSLO | Expected Performance | CSLO Performance |
|--|----------------------|------------------|
| PHYSICS002B CSLO 1: Students will be able to determine the force, the electric field, and the electric potential due to simple static charge distributions, and predict the movement of a charged particle in uniform electric and magnetic fields. | 100.00% | 0.00% |
| PHYSICS002B CSLO 2: Students will be able to analyze a DC circuit involving resistors and capacitors in series and parallel configurations powered by an emf device. | 100.00% | 0.00% |
| PHYSICS002B CSLO 3: Students will be able to determine images formed from plane and spherical mirrors as well as convex and concave lenses, calculate image properties such as image distance and magnification factor, and analyze interference and diffraction of light using wave theories. | 100.00% | 0.00% |
| PHYSICS002B CSLO 4: Students will be able to identify different subatomic particles, formulate the nuclear reactions, calculate energy released from nuclear reactions, and apply theory of relativity. | 100.00% | 0.00% |
| PHYSICS002B CSLO 5: Students will be able to acquire, analyze and present real-world experimental data with appropriate use of units, significant figures, tables and figures, and relate the results of experimental data to the physical concepts tested. | 100.00% | 0.00% |
| PHYSICS004A - Classical Mechanics | | |
| PHYSICS004A CSLO 1: Students will be able to identify physical properties and their units, and convert between British and SI unit systems. | 70.00% | 91.67% |
| PHYSICS004A CSLO 2: Students will be able to use vector analysis and calculus to determine displacement, velocity, and acceleration of a point mass under constant forces, draw free-body diagrams, and apply Newtonian Mechanics on rotational motion and equilibrium of rigid body. | 70.00% | 95.00% |
| PHYSICS004A CSLO 3: Students will be able to solve problems involving work and energy, momentum and center of mass, and apply conservation laws of energy and momentum. | 70.00% | 66.67% |
| PHYSICS004A CSLO 4: Students will be able to solve problems involving elastic deformation of solids, the pressure and buoyance force developed in fluids, and simple harmonic motion. | 70.00% | 76.67% |
| PHYSICS004A CSLO 5: Students will be able to acquire, analyze and present real-world experimental data with appropriate use of units, significant figures, tables and figures, and relate the results of experimental data to the physical concepts tested. | 70.00% | 81.67% |
| PHYSICS004B - Electricity Magnetism & Waves | | |
| PHYSICS004B CSLO 1: Students will be able to determine the force, the electric field, and the electric potential due to simple static charge distributions, and predict the movement of a charged particle in uniform electric field. | 70.00% | 95.45% |
| PHYSICS004B CSLO 2: Students will be able to perform DC and AC circuit analysis involving capacitors, inductors and resistors in series and parallel configurations attached to an emf device. | 70.00% | 90.91% |
| PHYSICS004B CSLO 3: Students will be able to determine the magnetic field induced by current in a wire including solenoids and toroids, and determine the force on a moving electric charge and a wire with current in uniform magnetic field. | 70.00% | 70.45% |

Average CSLO Performance

68.33%

51.82%

| CSLO | Expected Performance | CSLO Performance |
|--|----------------------|------------------|
| PHYSICS004B CSLO 4: Students will be able to identify various mechanical and electromagnetic waves, calculate properties of waves, and determine the relationship between wavelengths and frequencies of standing waves in varying elastic media. | 70.00% | 61.36% |
| PHYSICS004B CSLO 5: Students will be able to acquire, analyze and present real-world experimental data with appropriate use of units, significant figures, tables and figures, and relate the results of experimental data to the physical concepts tested. | 70.00% | 81.82% |
| PHYSICS004C - Thermodynamicsoptics and Modern Physics | | |
| PHYSICS004C CSLO 1: Students will be able to identify different thermodynamic processes and apply ideal gas laws and first and second laws of thermodynamics to solve problems involving heat transfer and heat engines. | 70.00% | 82.14% |
| PHYSICS004C CSLO 2: Students will be able to determine images formed from plane and spherical mirrors as well as convex and concave lenses, calculate image properties such as image distance and magnification factor, and analyze interference and diffraction of light using wave theories. | 70.00% | 85.71% |
| PHYSICS004C CSLO 3: Students will be able to apply theory of special relativity to physical situations involving time dilation, length contraction, Lorentz transformation, and relativistic momentum and energy. | 70.00% | 71.43% |
| PHYSICS004C CSLO 4: Students will be able to apply quantum mechanics to explain atomic structure, identify different subatomic particles, formulate nuclear reactions, and calculate energy released from nuclear reactions. | 70.00% | 92.86% |
| PHYSICS004C CSLO 5: Students will be able to acquire, analyze and present real-world experimental data with appropriate use of units, significant figures, tables and figures, and relate the results of experimental data to the physical concepts tested. | 70.00% | 82.14% |
| Average CSLO Performance | 68.33% | 51.82% |

SLO Analysis : Version by Zhao, Jiaxin on 10/20/2020 08:12

Note: The "Generate Data" feature did not load the data correctly. It also loaded the data for Physics 002A and Physics 002B, which are not part of the Physics AS-T program. The CSLO data for Physics 004A, Physics 004B, and Physics 004C above are manually typed in.

| Areas of Success | Areas for Improvement |
|--|---|
| Most of CSLOs exceeded expected performance. | CSLO 3 in Physics 004A and CSLO 4 in Physics 004B have performance below the expected performance. The related discussion need to be expanded to improve the students' performance for these two learning outcomes. |

PSLO Performance : Version by Zhao, Jiaxin on 10/20/2020 08:12

| PSLO | Expected Performance | PSLO Performance |
|---|----------------------|------------------|
| Physics | | |
| Physics, A.S- T Degree | | |
| PSLO 1: Students will be able to employ sophisticated problem solving techniques to identify the useful information provided, choose a strategy for solving the problem, demonstrate proficiency in arriving at a solution, test the solution, and interpret the result as they relate to appropriate physics concepts. | 70.00% | 0.00% |
| Average PSLO Performance | 35.00% | 0.00% |

| PSLO | Expected Performance | PSLO Performance |
|---|----------------------|------------------|
| PSLO 2: Students will be able to design an experimental method, predict results using appropriate scientific and mathematics theory, perform the experiment and collect data while minimizing sources of error, express results with graphical and mathematical support, complete thorough error analysis, and interpret experimental results in comparison with theoretical predictions. | 70.00% | 0.00% |
| PSLO 3: Students will be able to demonstrate efficient use of computer tools such as graphing programs, spreadsheets and databases, and basic word processing. They will also have fundamental knowledge of computer programming languages, algorithm development, and be able to write, compile, and run programs from scratch for problem solving. | 70.00% | 0.00% |
| PSLO 4: Students will be able to explain scientific theory verbally through presentation techniques and in writing through formal written reports, using scientific, mathematical, and analytical skills. | 70.00% | 0.00% |
| PSLO | | |
| Average PSLO Performance | 35.00% | 0.00% |

SLO Analysis : Version by Zhao, Jiaxin on 10/20/2020 07:35

The PSLOs are not evaluated yet and will be evaluated in the current college SLO evaluation cycle.

| Areas of Success | Areas for Improvement |
|------------------|-----------------------|
| undefined | undefined |

ISLO Performance : Version by Zhao, Jiaxin on 10/20/2020 07:57

| ISLO | Expected Performance | ISLO Performance |
|---|----------------------|------------------|
| West Hills College Lemoore | | |
| ISLO | | |
| Ability to Engage Diverse Perspectives | | |
| Describes, explains and evaluates the sources of his/her own perspective on selected issues in culture, society, politics, the arts or global relations and compares that perspective with other views. | 70.00% | 48.91% |
| Students will be able to describe how knowledge from different cultural perspectives might affect interpretations of prominent problems in politics, society, the arts and global relations. | 70.00% | 44.91% |
| Ethical Reasoning | | |
| Describes the ethical issues present in prominent problems in politics, economics, health care, technology or the arts and shows how ethical principles or frameworks help to inform decision making with respect to such problems. | 70.00% | 49.51% |
| Personal, Academic, and Career Development | | |
| Assesses personal knowledge, skills, and abilities; sets personal, educational, and career goals; works independently and in group settings; and identifies lifestyle choices that promote self-reliance, financial literacy, and physical, mental and social health. | 70.00% | 41.65% |
| Communication Competency | | |
| Average ISLO Performance | 46.14% | 28.04% |

| ISLO | Expected Performance | ISLO Performance |
|--|----------------------|------------------|
| Demonstrates effective interactive communication through discussion, i.e., by listening actively and responding constructively and through structured oral presentations to general and specialized audiences. | 70.00% | 49.21% |
| Develops and presents cogent, coherent and substantially error-free writing for communication to general and specialized audiences. | 70.00% | 55.61% |
| Negotiates with peers an action plan for a practical task and communicates the results of the negotiation either orally or in writing. | 70.00% | 47.63% |
| Analytical Inquiry | | |
| Identifies and frames a problem or question in selected areas of study and distinguishes among elements of ideas, concepts, theories or practical approaches to the problem or question. | 70.00% | 56.82% |
| Information Competency | | |
| Identifies and defines the nature and the extent of the information needed to accomplish a specific educational, professional, or personal objective and demonstrates the ability to locate, access, manage, evaluate, understand, and use information from diverse sources ethically and legally. | 70.00% | 52.94% |
| Quantitative Reasoning | | |
| Creates and explains graphs or other visual depictions of trends, relationships or changes in status. | 70.00% | 46.56% |
| Presents accurate interpretations of quantitative information on political, economic, health-related or technological topics and explains how both calculations and symbolic operations are used in those offerings. | 70.00% | 41.74% |
| GESLO | | |
| Humanities | | |
| Demonstrate an awareness and appreciation of the traditional humanistic disciplines such as art, dance, drama, literature, and music | 70.00% | 79.22% |
| Demonstrate an understanding of the interrelationship between creative art, the humanities, and the self | 70.00% | 70.78% |
| Demonstrate an understanding of Western and non-Western cultures | 70.00% | 0.00% |
| Recognize great works of the human imagination | 70.00% | 70.78% |
| Natural Sciences | | |
| Demonstrate appreciation and understanding of basic concepts, not just skills | 70.00% | 60.75% |
| Demonstrate specific inquiry into mathematical concepts, quantitative reasoning and application | 70.00% | 58.60% |
| Demonstrate understanding and appreciation of the methodologies and tools of science | 70.00% | 74.43% |
| Demonstrate understanding of the influence of scientific knowledge on the development of civilization | 70.00% | 59.28% |
| Local District Requirements | | |
| Demonstrate an understanding of personal health and well-being | 70.00% | 0.00% |
| Demonstrate an understanding of the importance of physical fitness and nutrition | 70.00% | 0.00% |
| Demonstrate an understanding of the relationship of people to the social and physical environment | 70.00% | 0.00% |
| Social Science | | |
| Demonstrate a knowledge of these institutions in both historical and contemporary contexts | 70.00% | 0.00% |

Average ISLO Performance

46.14%

28.04%

| ISLO | Expected Performance | ISLO Performance |
|--|----------------------|------------------|
| Demonstrate an understanding and appreciation of social, political, and economic institutions in western and non-western settings | 70.00% | 0.00% |
| Demonstrate an understanding of the role and impact of ethnic minorities and women | 70.00% | 0.00% |
| Explain the relationship between these institutions and human behavior | 70.00% | 0.00% |
| Language and Rationality | | |
| Demonstrate knowledge of communication from the rhetorical perspective including reasoning and advocacy, organization, discovery, critical evaluation and reporting of information | 70.00% | 76.09% |
| Demonstrate understanding of the psychological and social significance of communication | 70.00% | 72.31% |
| Effectively apply written and oral communication | 70.00% | 76.01% |
| Average ISLO Performance | 46.14% | 28.04% |

SLO Analysis : Version by Zhao, Jiaxin on 10/20/2020 07:36

The ISLOs mapping with CSLOs and PSLOs will be updated and evaluated following the college SLO evaluation cycle.

| Areas of Success | Areas for Improvement |
|------------------|-----------------------|
| undefined | undefined |

CTE Program Curriculum (CTE REVIEW ONLY)

Program Curriculum

How does the program ensure that the current curriculum is adequately meeting the needs of students?

No Value

Describe the curriculum changes anticipated in the next two years. These changes could include course sequencing and offerings, revisions, deletions, new courses, revised or new options within a program, or a proposed new program.

No Value

Instructional Program Data and Analysis

Instructional Program Data : Version by Zhao, Jiaxin on 10/19/2020 19:50

| Program name | Choose one: Course Success, Course Completion, Program Completion, or Productivity | Data - 3 years ago | Data - 2 years ago | Data - 1 year ago |
|--------------|--|--------------------|--------------------|-------------------|
| Physics AS-T | Course Success Rate | 65.6% | 71.3% | 71.1% |
| Physics AS-T | Course Completion Rate | 75.6% | 81.9% | 82.1% |
| Physics AS-T | Program Completion | 5 degrees awarded | 6 degrees awarded | 4 degrees awarded |
| Physics AS-T | Productivity | Productivity 275 | Productivity 374 | Productivity 268 |

Instructional Program Data Analysis : Version by Zhao, Jiaxin on 10/20/2020 08:03

The overall course success rate for the Physics AS-T program made a big improvement two years ago, and maintained over 70% for the past two years, and stayed above the Institutional Set Standard.

The overall course completion rate stayed 10% above the course success rate fairly consistently over the past three years.

The number of students getting the Physics AS-T degree fluctuated around 5 students per year for the past three years, with minimal changes.

The productivity in Physics AS-T falls below the college goal as the enrollment in this program is lower than other programs on campus.

Explain changes or revisions to your program that have impacted your rates.

There are no curriculum changes for the Physics AS-T program during this mid-term review cycle.

The one reason impacted the overall course success rate may be the more frequent offering of Math 001A that increased student success rate.

What steps will you take in the next program review cycle to improve your rates as compared to the institutional set standards, where applicable?

The current instruction and supporting services need to be maintained to keep the program course success rate above the 70% Institutional Set Standard. The low CLSO outcomes in Physics 004A and Physics 004B classes will be addressed to improve the outcome.

CTE Specific Data and Analysis (CTE REVIEW ONLY)

Examination Pass Rates

| Examin or License Title | Pass Rate - 3 years ago | Pass Rate - 2 years ago | Pass Rate - 1 year ago |
|----------------------------------|-------------------------------------|-------------------------------------|---------------------------------|
| Average | | | |

Job Placement Rates

| Year | 2nd Quarter after exit | 4th quarter after exit |
|---------|---------------------------------|---------------------------------|
| Average | | |

CTE Program Effectiveness (CTE REVIEW ONLY)

CTE External and Community Connections

Discuss the program's involvement in the community.

No Value

Discuss the program's involvement in any special accreditations, external regulations or advisory committees that have oversight to your program.

No Value

Discuss the program's involvement in the any program initiatives to meet the needs of social-economically diverse students, and/or those with non-traditional requirements (e.g. physical, mental disabilities, re-entry, gender, etc.).

No Value

Discuss the program's involvement in external funding, including state, federal and private grants.

No Value

Discuss any external factors that impacted your program over the last cycle, for example: legislative changes, grant funding, board policies, personnel, etc.

No Value

CTE Industry-Recognized Certificates, Licenses, and Credentials

What industry-recognized licenses, certificates or credentials does your program provide to completors?

No Value

CTE Program Effectiveness

What has been the efficacy of this program in terms of entry-level job placement as a result of the training students received?

No Value

What has been the efficacy of this program in terms of continuing education to meet the need for advanced training and or training in emerging technologies?

No Value

What has been the efficacy of this program in terms of other measures used to determine the success. (e.g. satisfaction surveys, employer surveys, or advisory committee feedback)?

No Value

Professional Development (FULL REVIEW ONLY)

Professional Development

Please describe professional development which has occurred in this program since the last program review.

No Value

Describe the program's plans for staff development over the next cycle based on your analysis of data trends in your program.

No Value

Program Goals (FULL REVIEW ONLY)

Program Goals

| Program Goals - Please list 3-5 goals for your program. | Program Activities - Please list the specific activities you will implement to accomplish the goals (e.g. implement a new course) and intended outcomes | Necessary Resources - Please list any additional resources (Faculty, Non-Faculty, Technology/Equipment, Professional Development, or Facilities) you will need to accomplish the activity. Specific details will be outlined in the Resource Request section | Outcomes - Please list the means of assessment/criteria for success including the timeline (measurable). |
|---|---|--|--|
| undefined | undefined | undefined | undefined |

Resource Requests

Resource Requests : Version by Zhao, Jiaxin on 10/20/2020 08:28

A lab technician is desired with shared responsibilities among Physics, Chemistry, and Biology labs. The Area Budget Committee Form is completed with the document regarding the Lab Technician position prepared by Dr. Kurt Sterling attached.

A part-time faculty is needed to cover some of the physics classes.

For each request you will be required to provide:

1. Item name and description
2. Reason and supporting data for item
3. Cost breakdown for each item

*** There are no related questions to this section. Please ensure you have completed the budget request form via the link above.

No Value

Program Alignment to the College Mission (FULL REVIEW ONLY)

Mission Statement

In the space below please describe how your program aligns with the college mission statement. Please address as many components of the mission statement as possible. (200 word limit)

No Value