APR Instructional Physics 2022-23 Latest Version

Annual program review for physics, reviewing the 2022-23 Academic Year

APR Instructional

Annual Course Student Learning Outcome Data : Version by **Cox, Cathleen** on **02/04/2024 20:15**

CSLOs	Expected/Benchmark Performance	Actual Performance (Aggregate of All Terms)
PHY104 - General Physics I		
1. Interpret multiple-representations of the same concept (for example, words, equations, graphs, diagrams.) (Active from Fall 2015)	70.00%	100.00%
2. Analyze the motion of simple mechanical systems using kinematic equations. (Active from Fall 2015)	70.00%	100.00%
3. Describe and discuss the concepts associated with Newton's laws. (Active from Fall 2015)	70.00%	100.00%
4. Apply conservation laws for energy and momentum to solve problems involving motion and forces. (Active from Fall 2015)	70.00%	100.00%
5. Analyze the uncertainty in measurements and propagation of uncertainty through subsequent calculations. (Active from Fall 2015)	70.00%	100.00%
PHY105 - General Physics II		
1. Interpret multiple-representations of the same concept (for example: words, equations, graphs, and diagrams.) (Active from Fall 2015)	70.00%	100.00%
2. Analyze problems involving solids, fluids, thermodynamics and heat, waves and vibrations, and sound. (Active from Fall 2015)	70.00%	100.00%
3. Describe and discuss the concepts associated with the laws of thermodynamics using discipline-specific terms. (Active from Fall 2015)	70.00%	100.00%
4. Analyze the uncertainty in measurements and propagation of uncertainty through subsequent calculations. (Active from Fall 2015)	70.00%	100.00%
PHY106 - General Physics III		
1. Interpret multiple-representations of the same concept (for example: words, equations, graphs, and diagrams.) (Active from Fall 2015)	70.00%	100.00%
2. Analyze problems involving electric forces and fields, circuits, magnetic forces and fields, electromagnetic induction, and electromagnetic waves. (Active from Fall 2015)	70.00%	100.00%
3. Describe and discuss the concepts associated with electric and magnetic fields and electromagnetic waves using discipline-specific terms. (Active from Fall 2015)	70.00%	100.00%
4. Analyze circuits using Ohm's law and Kirchoff's rules. (Active from Fall 2015)	70.00%	100.00%
5. Analyze the effect that magnetic fields have on moving charges. (Active from Fall 2015)	70.00%	100.00%
PHY107 - General Physics (Calculus) - Mechanics		
1. Interpret multiple representations of the same concept (for example: words, equations, graphs, and diagrams.) (Active from Summer 2018)	70.00%	100.00%
2. Analyze the linear and angular motion of mechanical systems using kinematic equations. (Active from Summer 2018)	70.00%	100.00%
3. Describe and discuss the concepts associated with Newton's laws using discipline-specific terms. (Active from Summer 2018)	70.00%	100.00%

CSLOs	Expected/Benchmark Performance	Actual Performance (Aggregate of All Terms)
4. Apply conservation of energy and momentum to solve problems involving motion and forces. (Active from Summer 2018)	70.00%	100.00%
5. Analyze and interpret measurements of physical phenomena and make meaningful comparisons between experiment and theory. (Active from Summer 2018)	70.00%	100.00%
PHY108 - General Physics (Calculus) - Waves, Thermodynamics, and Light		
1. Interpret multiple representations of the same concept (for example: words, equations, graphs, and diagrams.) (Active from Summer 2018)	70.00%	100.00%
2. Analyze problems pertaining to solids and fluids, heat, thermodynamics, and wave phenomena. (Active from Summer 2018)	70.00%	100.00%
3. Describe and discuss the concepts associated with the laws of thermodynamics using discipline-specific terms. (Active from Summer 2018)	70.00%	100.00%
4. Analyze and interpret measurements of physical phenomena and make meaningful comparisons between experiment and theory. (Active from Summer 2018)	70.00%	100.00%
PHY207 - General Physics (Calculus) - Electricity and Magnetism		
1. Analyze problems involving electric phenomenon, circuits, magnetism, electromagnetic induction, and electromagnetic waves. (Active from Summer 2018)	70.00%	100.00%
2. Describe and discuss the concepts associated with electric fields, electromagnetic induction, and electromagnetic waves. (Active from Summer 2018)	70.00%	100.00%
3. Analyze simple circuits using Ohm's law and Kirchoff's rules. (Active from Summer 2018)	70.00%	100.00%
4. Relate course topics using Maxwell's equations. (Active from Summer 2018)	70.00%	100.00%
5. Properly and safely use equipment such as voltmeters, ammeters, power supplies, and oscilloscopes in the laboratory. (Active from Summer 2018)	70.00%	100.00%
PHY208 - General Physics (Calculus) - Optics and Modern Physics		
1. Analyze problems involving optics, special relativity, quantum mechanics, atomic physics, nuclear physics, and fundamental particles. (Active from Summer 2018)	70.00%	100.00%
2. Describe and discuss the concepts associated with relativity and quantum mechanics. (Active from Summer 2018)	70.00%	100.00%
3. Identify the consequences of Einstein's postulates of relativity. (Active from Summer 2018)	70.00%	100.00%
4. Verify the photon concept of light with experiments on the photo-electric effect. (Active from Summer 2018)	70.00%	100.00%

APR Questions Tableau : Version by **Cox, Cathleen** on **02/04/2024 20:15**

Using the Data Provided (https://10az.online.tableau.com/#/site/ltcc/views/ProgramReview/LTCCProgramReviewSummary?:iid=1) please provide the number of students (headcount) that are served by the discipline.

2018-19 36
2019-20 30
2020-21 28
2021-22 23
2022-23 31

Using the Data Provided (https://10az.online.tableau.com/#/site/ltcc/views/ProgramReview/Demographics?:iid=1), identify the populations served by the discipline. Are there any inconsistencies? Does the Population served reflect the population of the college? If not, why, and how can the discipline serve a population more reflective of our community?

The ethnicity of students in Physics fairly consistent with that of the college. Physics has a slightly higher percentage of White, Asian, and Latinx students, compared to the college. Slightly lower for Black, Native American, Pacific Islander.

Using student success data (https://10az.online.tableau.com/#/site/ltcc/views/ProgramReview/SuccessRatesOverall?:iid=1), identify any trends in successful completion of courses.
Are there particular courses (https://10az.online.tableau.com/#/site/ltcc/views/ProgramReview/SuccessRatesbyCourse?:iid=1) students are struggling in?
Are there any demographics that are less likely to complete certain courses in the discipline?
What steps need to be taken to support students and the department in meeting its equity obligations?
Success rates for all physics classes are 90% or above. I attribute this to the math pre-requisites for physics courses. Students are prepared when they enter the physics sequences.
Are there any courses lacking Title V Updates?
If so, how many and why?
(Please check your courses in eLumen for the most recent list of courses that require updates.)
4 physics classes are currently being update, Phy 107, 108, 207, 208
Describe the approach to scheduling in terms of offering a balance of Face to Face (F2F) and Online opportunities for students.
The physics department does not offer online classes. It is generally agreed among the physics teaching community (including The American Association of Physics Teachers) that students taking physics are not well-served in online classes. Physics is a hands-on subject.
Are there any insights specific to this discipline regarding scheduling modality in terms of success rates, student retention, or course cancellations?
The success rates for students during Covid 19 lock-down are consistent with other years. However students and faculty would agree it was not an ideal learning situation.
Are the full-time faculty teaching the courses with the most face to face students? Why/why not?
Yes, full time faculty teach face to face classes exclusively.
Are staffing levels adequate to fulfill the purpose of the program?
The physics department has challenges covering all courses, particularly with the addition of Dual Enrollment course.
What professional development opportunities have faculty in this discipline taken advantage of? Are there any unmet professional development needs?
Full time faculty regularly attend conferences of The American Association of Physics Teachers, and occasionally participate in other opportunities, including NCORE
Where applicable, outline and explain any budget shortfalls for this discipline.
The current budget is adequate to cover consumables and replacement of small apparatus. There is no consistent funding source for new equipment.
If additional financial resources are needed, please describe how they will increase student success, retention, or completion.
I will make no requests at this time. When the new lab opens and we can move, organize, and inventory our existing equipment, I expect to have some requests for replacement equipment, as well as some new experiments I would like to add to the curriculum.
Using the SLO Data above, are there any SLOs for any particular courses that students are not successfully understanding? How do you plan to address this?
SLO results are good for all physics course. Again, I attribute this at least in part to adequate preparation in prerequisite math courses.
What are the major strengths of your department?
The physics department has small class sizes, so students get abundant personal attention. Nearly 100% of students taking physics courses successfully transfer to 4 year university or to a graduate program.
In what ways could your department improve to better meet the needs of the College and support student success?
I wish we could offer an introductory engineering course.
What are the biggest challenges your department may face in making these improvements?
The number of students taking an engineering course would likely be prohibitively small.
Identify any other questions, comments, suggestions, or concerns you may have.
LTCC currently does not have a consistent source of funding for updating lab equipment. Currently, the need for equipment is identified using the APR process, but there are no dedicated funds for purchasing them. I suggest the college budgets for lab equipment and creates a priority list for purchases from the APR reports.

Dean Review : Version by **Williams, Sarah** on **03/11/2024 19:17**

Sarah Williams