#12

COMPLETE

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Page 1: I. Program Overview and Update

Q1

I.1. Department(s) Reviewed:

Physical Sciences (Physics & Astronomy)

Q2

I.2. Lead Author:

Miriam Simpson

Q3

I.3. Collaborator(s) - List any person that participated in the preparation of this report:

Scott Stambach, Glenn Thurman

Q4

1.4. Dean/Manager:

Kim Dudzik

Q5

Initial Collaboration Date with Dean:

Enter the initial date you met with your dean to discuss your program review using this format: MM/DD/YYYY **09/17/2021**

Page 2: II. Program Reflection and Description

Q6

II.1. Provide your program's mission statement:

The Physics and Astronomy program at Cuyamaca College aims to provide quality, hand-on education in objective, creative, scientific thought to any student. We aim to foster curiosity and teach the scientific and mathematical ideals the objectivity of the physical world, while acknowledging the historic inequities inherent to the fact that science is done by humans susceptible to the social and cultural world they inhabit.

Q7

II.2. How is this program advancing the college mission, vision and values?

Our program has worked hard to create a strong focus on quality, equity-minded teaching. We do this by carefully hiring and cultivating and supporting open-minded, creative faculty and then providing them with high-quality resources, support, and training, encouraging them to grow and innovate in student-centered classrooms. To do this we have carefully thought out and created equity-minded curriculum focusing on student-led projects and skill building, created a community of practice for full and part-time faculty, and shifted resources to research-tested, student-reviewed assessments and projects.

Q8

II.3. How does your program support the college's strategic goal of implementing guided pathways?

Our program has been updating our webpages and degree maps and participating in creating an Academic and Career Pathway by collaborating with other STEM program. We have also been utilizing the STEM grant to send as many faculty as we can through EMTLI while simultaneously creating a community of practice to foster more equity minded teaching methods.

Q9

II.4. Is the program description in the current college catalog up to date and accurate?

If No, what steps will you take to revise the college catalog description?:
We have aligned our program level outcomes with the rest of the STEM Academic and Career Pathway and we will be submitting these new outcome to curriculum in the spring semester.

Page 3: III. Course Curriculum, Assessment and Student Success

Q10

III.1. Access the Five Year Curriculum Review Cycle (requires GCCCD login). Have all of your active courses outlines been reviewed within the last five years?

Yes

Q11

III.2. Please list any planned changes from the current semester forward for curriculum (courses, degrees, and/or certificates) and the rationale for those changes (e.g., labor market data, advisory committee recommendations, transfer institution changes, industry trends, statewide transfer model curriculum).

1. We will be updating the Physics AS and AS-T degrees to both reflect current curriculum at transfer institutions and align our PLOs with other STEM programs for our ACP as well as updating to the new physics course alignment with Grossmont.
2. We will be considering working with Grossmont and lowering the prerequisite requirement for PHYC 201 so that we are not gatekeeping students.
3. We are planning to add a UC transfer degree.

Q12

III.3. How is your program meeting the needs of students, and/or articulation with four-year institutions?

Currently we are doing fine with physics majors but we are working with engineering and biology/health sciences to make sure their needs are met as the majority of our students transfer into those fields. This includes regular meetings with these programs and close contacts at SDSU and UCSD.

Q13

III.4. Please upload the most recent version of your program's course SLO assessment plan. Click here for an Assessment Plan Template

SLO_Physics_3YearPlan SP22.pdf (181.7KB)

Q14

III.5. Please provide a high-level analysis of your SLO findings over the past year and discuss what changes, if any, were made as a result. Include any student learning-related successes and challenges that SLO results have revealed for your department.

Over the past 5 years we have used topic/concept based SLOs and it has informed small changes to our classrooms such as equipment changes for labs and demonstrations, changes in assignments and time spent on particular topics in lectures. These changes have yielded better results on said topics/concepts, however, upon further reflection, we have decided we as a department are more pedagogically concerned with exit skills for our students. As such, we are working on an overhaul of our SLOs to better match our new PLOs and assess skills rather than concepts. Hoping to implement these new ideas in Spring 2022.

Page 4: IV. Degree and Certificate Programs

Q15 **Yes**

IV.1. Does your program offer any degree/certificate programs?

Page 5: IV. Degree and Certificate Programs

Q16

IV.2. For each degree and certificate, indicate how many awards were conferred in the past 5-years.

DegreesPhysics.pdf (44KB)

Q17

IV.3. Please indicate when each degree and certificate was last reviewed and updated (semester):

Fall 2015

Q18

IV.4. Can students complete the degree/certificate requirements within a 2-year period?**Requirement of Title 5, California Code of Regulations and Accreditation Standard II.A.

Yes

Q19

IV.5. How are you currently assessing your PLOs?*Note: The college requires assessment of PLOs within a 4-year cycle

Currently we are overhauling these to align with our ACP. We will assess them via project. We had previously assessed them by linking them to the SLOs.

Q20

IV.6. Are the PLOs in the catalog an accurate reflection of the department or discipline's current learning objectives?

If No, briefly explain the plan to revise:
No, we will updated them in spring.

Page 6: IV. Degrees and Certificate Programs continued

Q21

IV.7. Are the PLOs mapped to the course SLOs?

Yes

Page 7: IV. Degree and Certificate Programs continued

Q22

IV.8. The College has set a 2024 goal of reaching a 77% course success rate (students passing with a grade A, B, C or P out of those enrolled at census) for the College as a whole. What is your department or discipline's 4-year (2024-25) goal for success rate across all courses in the department or discipline and how has the department of discipline's success rate across all courses changes within the past 4-years?

Physics has a discipline goal of 80% course success rate which we have exceeded every semester. Overall our success rates fluctuate in the 80-90% (we have an average success rate of 88%. We are happy with this and still hope to improve it.

Astronomy has 77% average student success rate that has remained relatively constant over the last few years. As these courses are general education rather than major courses, this is acceptable, since it meets the college goals, but we still have hope we can improve it over time.

Q23

IV.9. What other qualitative or quantitative data (from any source) is the program using to inform its planning for this comprehensive program review? Please reference additional internal or external data, such as retention and enrollment, student survey results, focus groups, student throughput, or other data, if there are any notable trends.

As always, in Physics, though we have high success rates and low equity gaps compared to the college, we are concerned with representation. African Americans (3% of our students vs 6% of the overall population) and women (<40% of our students vs >50% of the overall population) remain significantly underrepresented, but we have made significant progress with our Hispanic/Latino students (an increase from 20 to 30% almost matching the college population while still maintaining equity numbers!!) We have also improve our representation of women with a 10% increase in women enrolled in physics courses (this is slightly attributed to growth in our health science track, which has always had more women than the engineering track but still, it's exciting).

Astronomy better matches the overall student population at Cuyamaca.

Q24

IV.10. Please review the college-wide and program data sets, which have identified equity gaps based on the following criteria: 3% n=10 students/enrollments. Which groups are experiencing equity gaps in your program? Please discuss all equity gaps identified in the data.

In Physics, we have identified a large equity gap for Hispanic/Latino students (9% in Fall and 4% in Spring) and smaller gaps for Asian and African American students (<5% for both overall). For all groups the equity gaps seem to be decreasing, even as we improve the overall representation of these groups in physics courses.

Astronomy has some equity gaps for African American and Hispanic/Latino students.

Q25

IV.11. What department/discipline (or institutional) factors may be contributing to these lower rates of success for these groups of students?

Our equity gaps mirror those of the institution, suggesting institutional factors are affecting us. We have, however, made some good progress on our equity gaps and representation simultaneously by dismantling barriers to course entry, training and supporting faculty on creating good support and community in their classrooms, and by rethinking our assessments and curriculum to be more project and skills based. For our largest equity gap, Hispanic/Latino students, we have drastically increased representation so our demographics better match the campus, while still improving equity gaps. We still have work to do as our gaps are much worse for the first class in each series, meaning we have work to do on retention and not gatekeeping students.

Q26

IV.12. What action will the department or discipline take to address these equity gaps in the short-term (next year) and long-term (next four years)? Consider the specific steps your department will take to address equity gaps and discuss any plans for diversifying department faculty in alignment with the GCCCD Board Resolution 20-015.

We will continue our work recruiting and supporting faculty in equity-minded teaching practices and look to provide more in class supports and community engagement for students. We also hope to form a mentoring program for students in physics with an emphasis on underrepresented students and student groups with higher equity gaps. We also plan to implement more project-based, hands-on, and student-led curriculum paired with skills-based SLOs. We hope to be able to diversify our faculty (in physics this is an ongoing pipeline problem) by developing relationships with promising part-time faculty.

Q27

IV.13. What did your program learn from the transition to remote teaching and operations over the past year? How can this be used to improve the student experience in the future?

We learned that there are very important technological resources that can allow us to better customize the student experience and meet students where they are. Most importantly we learned that we can be flexible without losing control of the class.

Q28

OPTIONAL DOCUMENT UPLOAD 1: Please upload any data-related documents you would like to attach to your program review using the button below. PDF and Word documents may be uploaded.

Respondent skipped this question

Q29

OPTIONAL DOCUMENT UPLOAD 2: Please upload any other data-related documents you would like to attach to your program review using the button below. PDF and Word documents may be uploaded.

Respondent skipped this question

Page 8: IV. Degree and Certificate Programs continued

Q30

Does your program offer courses via distance education excluding emergency remote teaching in 2020-21 (classes that would have been taught in person, if not for the pandemic)?

Yes

Page 9: IV. Degree and Certificates Programs continued

Q31

IV.14. Are there differences in success rates for distance education (online) versus in-person sections?

No

Q32

IV.15. If there are differences in success rates for distance education (online) versus in-person classes, what will the program do to address these disparities?

So far our success rates look about the same, sometimes better online. Not much data yet though and all during a pandemic.

Q33

IV.16. What mechanisms are in place to ensure regular effective contact (Guided to Best Practices in Online Teaching) within online courses across the discipline or department?

We use lots of commenting in Canvas, smart responses for assignments in Canvas, and regular meetings with students.

Q34

IV.17. What innovative tools and strategies are you using in your online courses to engage students and support student success?

We have shifted many labs and assessments to student-led, project-based assignments rather than traditional tests, homework, and labs.

Page 10: IV. Degree and Certificate Programs continued

Q35

IV.18. Is your program a career education program (e.g., does it prepare student to directly enter the workforce)?

No

Page 11: IV. Degree and Certificate Programs continued

Q36

IV.19. Please share your observations about the employment rate for your program over the past several years.

Respondent skipped this question

Q37

IV.20. What is the institution-set standard for your program's employment rate? The institution set standard is what you would consider the lowest acceptable employment rate for your program (or "floor").

Respondent skipped this question

Q38

IV.21. What would you like your program's employment rate to be, ideally (stretch goal)?

Respondent skipped this question

Page 12: IV. Career Exploration and Program Demand (All Programs)

Q39

IV.22. What is your program doing to prepare students for successful transition (e.g. transfer and career readiness)? Please include information on how your program is helping students explore careers in your program area.

We provide a number of internship and paid research opportunities to students with support on the applications. We also have speakers come in from various careers related to physics and when not in a pandemic we provide field trips to career-related facilities.

Q40

IV.23. What do the latest labor market data reveal about the careers (including those for transfer students) for which your program prepares students? Consider what career information you would share with students on a career or transfer pathway in your area. Labor market data may be sourced from the California Employment Development Department. You can also contact the Institutional Effectiveness, Success, and Equity Office to access additional labor market information related to your program.

The labor market data indicates we should probably have a data science certificate as well as GIS classes for our physics and engineering students.

Q41

OPTIONAL - If your program has labor market data to include in your program review, please use the upload button to attach the file.

Respondent skipped this question

Page 13: IV. Strengths, Challenges & External Influences

Q42

IV.24. Please describe your program’s strengths.

We have a team of faculty who are dedicated to engaging students by constant improvement of ourselves and our teaching practice. We have good equipment and resources for labs, demonstrations, and online recording. We have thriving engineering and health science programs that feed our program lots of students. We maintain strong relationships with our related programs and Grossmont to break down barriers and conflicts for students before they happen.

Q43

VI.25. Please describe your program’s challenges.

We currently have no laboratory technician meaning faculty are doing unsafely doing work that they are untrained and unpaid for, and thousands of dollar's worth of equipment is not being maintained or monitored or even correctly cataloged. We absolutely cannot continue to innovate without support in this area, and student will be impacted.

Q44

IV.26. Please describe external influences that affect your program (both positively and negatively).

We are struggling to find a new hybrid schedule that works for students as the pandemic changes and we have no precedent or useful data to make decisions. We are also still struggling with how to get lab kits out to online students, and now with no lab tech this problem is much worse.

Q45

IV.27. Given these factors, what opportunities exist for the program to advance student success and equity in the next 4 years?

We hope to leverage the hybrid model and the extensive material we recorded/developed over the pandemic to create a more inclusive space for students, particularly those who work, are unfamiliar with the college culture, or have children. We want to create a program that has high flexibility and support.

Page 14: V. Previous Goals

Q46

1. Previous Goal 1:

Redesign PHYC 130/131 Lecture and Labs

Q47 **Student Validation & Engagement**

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q48 **Completed**

3. Goal Status

Page 15: V. Previous Goals continued

Q49

Please describe the results or explain the reason for the deletion/completion of the goal:

These courses have been redesigned to be more relevant to health/biological science majors both in person and online.

Q50 **Yes**

Would you like to submit another previous goal?

Page 16: V. Previous Goals continued

Q51 **Respondent skipped this question**

Would you like to submit another previous goal?

Page 17: V. Previous Goals continued

Q52

1. Previous Goal 2:

Lab Updates (PHYC 190/200/210)

Q53 **Student Validation & Engagement**

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q54 **Completed**

3. Goal Status

Page 18: V. Previous Goals continued

Q55

Please describe the results or explain the reason for the deletion/completion of the goal:

We have purchased and implemented new equipment for these labs and are implementing them in the relevant courses.

Q56 **Yes**

Would you like to submit another previous goal?

Page 19: V. Previous Goals continued

Q57

Would you like to submit another previous goal?

No

Page 20: V. Previous Goals continued

Q58

1. Previous Goal 3:

Astronomy Updates

Q59

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Student Validation & Engagement

Q60

3. Goal Status

In Progress - Please describe the goal and action steps in the 4-Year Goals section (Section VI.)

Page 21: V. Previous Goals continued

Q61

Please describe the results or explain the reason for the deletion/completion of the goal:

Respondent skipped this question

Q62

Would you like to submit another previous goal?

Respondent skipped this question

Page 22: V. Previous Goals continued

Q63

Would you like to submit another previous goal?

No

Page 23: V. Previous Goals continued

Q64

1. Previous Goal 4:

Respondent skipped this question

Q65

Respondent skipped this question

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q66

Respondent skipped this question

3. Goal Status

Page 24: V. Previous Goals continued

Q67

Respondent skipped this question

Please describe the results or explain the reason for the deletion/completion of the goal:

Page 25: VI. 4-Year Goals

Q68

1. Goal 1:

Faculty recruiting, training, and support in equitable teaching practices - SEED Project & EMTLI

Q69

Guided Student Pathways

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q70

3. Please describe how this goal advances the college strategic goal(s) identified above:

We hope to create a strong faculty culture of equity-minded teaching aimed at engaging students and closing equity gaps. This relates to the guided pathways principles of helping students find their path and stay on in from a classroom perspective.

Q71

4. Please indicate how this goal was informed by SLO assessment results, PLO assessment results, student achievement data, or other qualitative or quantitative data (from any source):

This goal was informed by a look at our program's equity gaps.

Q72

5. Action Steps for the Next Year: If you are requesting resources in order to achieve this goal, please list them below as action steps and specify the type of request (e.g., submit technology request for new laptop computers).

1. Encourage any new faculty to participate in EMTLI
2. Continue community of practice for faculty

Q73

6. How will this goal be evaluated?

We will evaluate this goal by looking at our equity gaps for success and retention.

Q74 **Yes**

Would you like to propose a new, 4-year goal?

Page 26: VI. 4-Year Goals continued

Q75

Goal 2:

Outreach - web updates, social media posts, K-12 visits, cool science demos at events in the region

Q76 **Guided Student Pathways**

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q77

3. Please describe how this goal advances the college strategic goal(s) identified above:

We hope to increase engagement with our program as well as the STEM ACP and get students career exposure and experience.

Q78

4. Please indicate how this goal was informed by SLO assessment results, PLO assessment results, student achievement data, or other qualitative or quantitative data (from any source):

This goal was informed by our demographic data. We are trying to close representation gaps with women and students of color by getting them involved further upstream.

This was also motivated by a desire to better engage with students as well as work with pathway navigation, outreach, and looking forward to the future of work-based learning.

Q79

5. Action Steps for the Next Year: If you are requesting resources in order to achieve this goal, please list them below as action steps and specify the type of request (e.g., submit technology request for new laptop computers).

Lab Tech Request - we will need a lab tech to help us set up and perform demonstrations, and possibly post them to social media accounts/youtube.

Q80

6. How will this goal be evaluated?

We will look at our demographic data as well as our success rates by demographic.

Q81 **Yes**

Would you like to propose a new, 4-year goal?

Page 27: VI. 4-Year Goals continued

Q82

1. Goal 3:

In-Reach - job talks, mentoring, and field trips for students

Q83 **Guided Student Pathways**

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q84

3. Please describe how this goal advances the college strategic goal(s) identified above:

This directly addresses the guided pathways goals of keeping students on a path and helping them put career choices at the forefront of their educational planning.

Q85

4. Please indicate how this goal was informed by SLO assessment results, PLO assessment results, student achievement data, or other qualitative or quantitative data (from any source):

Currently we lack mentoring and could do much better on career engagement. This is based on looking at other programs.

Q86

5. Action Steps for the Next Year: If you are requesting resources in order to achieve this goal, please list them below as action steps and specify the type of request (e.g., submit technology request for new laptop computers).

1. New Lab Tech - this position is key in helping run and chaperone field trips
2. Better connections with career center.

Q87

6. How will this goal be evaluated?

We will look at student retention and success as well as students transferring and getting internships, work-based learning positions, research positions, etc.

Q88 **Yes**

Would you like to propose a new, 4-year goal?

Page 28: VI. 4-Year Goals continued

Q89

Goal 4:

Project-Based Learning

Q90 **Student Validation & Engagement**

2. Which College Strategic Goal does this department goal most directly support? (Check only one)

Q91

3. Please describe how this goal advances the college strategic goal(s) identified above:

Project-based learning is a pedagogical strategy that engages students by bringing a subject to them and giving them choices about how to engage with it, therefore building on their inherent skills and experiences. When done well, this can circumvent many institutional problems with race, culture, and education. We hope to train and encourage more faculty to do this work with support from other faculty and a skilled laboratory technician.

Q92

4. Please indicate how this goal was informed by SLO assessment results, PLO assessment results, student achievement data, or other qualitative or quantitative data (from any source):

This is informed by educational research data.

Q93

5. Action Steps for the Next Year: If you are requesting resources in order to achieve this goal, please list them below as action steps and specify the type of request (e.g., submit technology request for new laptop computers).

1. New lab tech - we need someone to order, organize, and distribute free supplies to students (much harder than running packaged labs as we want to be reflexive to custom student needs) and also support some of the development process including troubleshooting technical problems.
2. Create a library of supplies.

Q94

6. How will this goal be evaluated?

Student Success data and SLOs. These projects will be used to evaluate skills-based SLOs and PLOs.

Page 29: Resources Needed to Fully Achieve Goal(s)

Q95

What resources is your program requesting this year to achieve the program's goals? (Check all that apply)

Classified Resource Needs,

Supplies/Equipment and Other Resource Needs

Page 31: Final Check

Q96

Are you ready to submit your program review?If you would like to go back and review a section, select a section a click "Next."

I am ready to submit my program review