

Las Positas College
ANNUAL PROGRAM REVIEW TEMPLATE
Review of AY 2011-12

Name of Program	Division	Author(s)
Astronomy and Physics	STEMPS	Eric W. Harpell

INSTRUCTIONS:

1. This Annual Program Review covers the time frame academic year 2011-2012.
2. The planning should be for the academic year 2014-2015.
3. Use the Save As feature in Word to save this template with your program name, so that you do not overwrite the original template (e.g., Bio, math, EOPS)
4. In each section, click in the box under the instructions and fill in your information. The box will expand as you type. If a section is not pertinent to your program enter N/A in the box; do not leave it blank.
5. To see how other programs completed sections in the Annual Program Review, visit the Examples Template on the PR website. The examples are from a variety of programs and may give you ideas of how to respond for your own program.
6. When you have completed the form, run the spell-checker (**click inside the text in the first box**, then click on the Review tab and find Spell-Check in the far left corner of the ribbon).
7. Please address your questions to your Program Review Committee representatives or the PR co-chairs Jill Carbone and Teri Henson. Concerns, feedback and suggestions are welcome at anytime to PRC representatives or co-chairs.
8. Instructions for submitting your Annual Program Review will be available at the start of the fall semester.

STATEMENT OF PURPOSE:

- Review and reflect on the student experience, with the goals of assessing and improving
 - student learning and achievement
 - services for students
 - program effectiveness.
- Provide a forum for each program's findings to be communicated to Administration
- Create written records of what is working well, what can be improved, and specific plans for implementing chosen improvements.
- Collect information that will contribute to institutional assessment and improvement.

I. MISSION

State the current program mission

(A mission statement should address the unique role and scope of the program. Consider the operating mission of your program. Identify specific purposes within your program (e.g., certificates, degrees, general education, matriculation, assessment). Avoid vague, overbroad language.)

The mission of the physics and astronomy program is to fulfill transfer requirements for a physical science class or laboratory; and to provide a complete sequence of transferable classes for students majoring in the physical or life sciences. In particular, our physics 2 and 8

series courses provide the prerequisite skills, conceptual understanding, and critical thinking ability that students will need to succeed in the life sciences, engineering, and physical science majors. Beyond the physics 2 and 8 sequences, many students who do not plan to major in the sciences but do need a physical science class and/or laboratory can take astronomy or conceptual physics in order to receive their A.A. degree, or to transfer to a baccalaureate granting institution or technical program. Concepts, skills, and critical thinking vital to success in a wide variety of majors are also integral parts of these less technical, introductory courses.

The mission of Las Positas College is:

Las Positas College is an inclusive, student-centered institution providing learning opportunities and support for completion of transfer, degree, basic skills, career-technical, and retraining goals.

(NOTE: this is the draft mission statement, currently under review.)

Discuss how the program supports the college mission.

The physics and astronomy department supports the college mission of providing transferable physics and astronomy courses articulated with virtually all Baccalaureate granting Institutions in California. Las Positas students taking the physics 8 and 2 series will transfer to a four year school, having received the critical thinking skills and technical training needed for success there as well as in the career marketplace. As instructors, we are concerned on a daily basis with fulfilling the college's mission of providing the students with the skills and a proficiency in critical thinking necessary to succeed throughout their education and career. As a result, problem solving methods, data acquisition and analysis skills taught in the physics lecture and laboratory class are directly applicable to the workplace. As with our technical physics courses, the introductory astronomy and conceptual physics classes taught at Las Positas also encourage success at the upper division and career level by training the students to think critically and logically about difficult concepts in the sciences. Finally, science classes at Las Positas College also support the College's mission by helping to create an informed citizenry, who better understand their relationship to the local and global environment.

II. PROGRAM ANALYSIS

A. Courses (For Instructional Programs Only)

1. Will any course outlines be revised or updated in the academic year 2014-2015?

(Highlight the appropriate box to type in an X.)

YES NO

If yes, in the table below, please list which courses will be revised or updated and the reason for the revision.

(Click in the box under Courses to start entering information. Tab to move to the next box. Tab in the last box to create a new row.)

Course(s)	Reason for Revision
Physics 10	Last revision 1999. Format change due, update texts, typical assignments.
Astronomy 10	Last Revision 2004. Format change due, update texts, typical assignments, update course contents
Astronomy 20	Last Revision 2004. Format change due, update texts, typical assignments. update course contents
Astronomy 30	Last Revision 2004. Format change due, update texts, typical assignments. update course contents
Physics 2A	Last Revision 2004. Format change due, update texts, typical assignments. update course contents
Physics 2B	Last Revision 2004. Format change due, update texts, typical assignments. update course contents

2. Will new curriculum (*e.g.*, course outlines, degrees) be submitted to the Curriculum Committee for the academic year 2014-2015?

YES NO

If yes, please describe briefly what new curriculum is planned.

-New course outline for courses listed above to reflect updated format and slight changes to course content, texts, and assignments.

B. New Initiatives (AY 2014-15)

Are any new initiatives planned for the academic year 2014-15?

(Examples of new initiatives include, but are not limited to: new degrees or certificates, new pathways, new outreach efforts.)

YES NO

If yes, please describe briefly what new initiatives are planned.

AST in Physics

C. SLOs/SAOs

1. Status of course SLOs/SAOs and assessments for AY 2011-12.

(Since the Program Review process is beginning in 2013 and the assessments for AY 2012-13 will not be complete, analyze the assessments for the AY 2011-12). Click in the box under Number of Courses Offered. Press Tab to move to the next box. Press Tab at the end of the row to create a new row.

Number of Courses Offered (AY 2011-12)	Number of Courses with SLOs (AY 2011-12)	Number of Courses Assessed within the last TWO years (AY 2010-11, AY 2011-12)
11	11	1

2. How frequently have course SLOs/SAOs been assessed? (e.g: every semester, every other semester, once a year.)

(This is a summary; it is not a list of courses and their assessment frequency.) Click in the box and begin typing. The box will expand as you type.

Astro 10 has been assessed every semester since Fall 2011. No other assessments were done in the period examined.

3. Status of program-level SLOs/SAOs and assessments for AY 2011-12.

Number of degrees/certificates offered	Number of degrees/certificates with SLOs	Number of program level SLOs/SAOs
1	1	1

4. Analysis of SLO/SAO data for AY 2011-12.

(Attach a summary of the program's AY 2011-12 SLO/SAO data as an appendix.)

- a. Please describe the program-wide dialogue on assessment results, including assessment of distance education courses. Where would one find evidence of this dialogue?

(This section concerns the type and variety of dialog regarding assessment results, not the assessment results themselves. For examples of evidence, consider: meeting notes, program coordinator's records of dialogue, or email.) For each of these questions, click in the following box and begin typing. The box will expand as you type.

Assessments have been done during the period examined by one full time instructor, but no other members of the physics and astronomy department. In general, assessments covered only a small fraction of courses offered during the period examined. More course SLO's have been assessed by the same instructor for 2012-2013, but a Sabbatical leave has interrupted continuity of these assessments. Health Issues for another full time instructor have also interrupted the continuity and assessment of SLOs.

SLO's have been discussed at physics and astronomy faculty meetings. There is no written documentation regarding these discussions, which have occurred on Wednesday Afternoons when there are no town or division meetings, approximately twice per semester.

In response to our dialogue about relatively low assessments, some changes have been put in place in individual courses, particular in Astronomy 10, Astronomy 30, and Physics 10L. In astronomy 10 distance education sections, these changes have taken the form a new type of quizzes based on popular videos on astronomy (from the Universe series, for example), which are available for free online. Students are required to watch these videos and write out written descriptions, as well as answer specific questions about them.

Reponses to this adjustment has so far been popular, and appears to have resulted in an overall increase in performance and understanding. In physics 10L, the lab manual was retired, and an entirely new set of online and take home labs have been written to take their place. In practice, this has resulted in a smaller number of more detailed activities for the students, resulting in greater satisfaction with the labs, and better understanding of important concepts. In Astronomy 30, a few of the more technically difficult online labs have been eliminated, in favor of more hands on activity in class, and more detailed analysis of existing lab. Although there is little data on success or failure of this approach yet, it seems to be working well.

- b. Please summarize what was learned from the assessments, including distance education courses. How will these results be used for improvement/s?

(Please provide at least two paragraphs. One paragraph should address face-to-face assessments, the other paragraph should address distance education assessments. If the course is taught in both face-to-face and distance education modes include a paragraph comparing the assessment results.)

Assessments in introductory Astronomy indicate that students are learning a great deal of specific information, but are retaining “big picture” concepts such as distance and time scales at a lower frequency than is desirable. Interestingly, students who entered the class with a relatively advanced perspective on the scale of the Universe left with a modest increase in perspective, while students who entered with very low initial assessment scores left with a significant increase in perspective. Various approaches are being tried to raise the level of all students, primarily including a more rigorous and specific set of learning outcomes for the students. Recent Physics assessments have been very promising and indicate that the approach taken so far is correct and requires little conceptual change. Small adjustments can and should be made, however, to address deficiencies in mathematical reasoning. While math skill levels are sufficient in most cases, the ability to apply mathematical concepts to physical situations can and should be improved in physics 8 level courses. Physics 10 and physics 2 level course will be assessed for the first time this Fall. So far,

- c. To what extent will, and how, do assessment results support resource requests for AY 2014-15?

N/A

- d. What are the general plans for assessments in the upcoming academic year AY 2014-15 (*i.e.* additional assessments or reassessment)?

Physics 8C, Physics 10, Astronomy 10, Astronomy 20, and Astronomy 30 will be assessed in Fall 2013. Adjunct instructors teaching physics will be strongly encouraged to carry out assessments. Sabbatical leave and Health issues will continue to effect the assessment cycle for Fall 2013, and Spring 2014, with a normal assessment cycle returning thereafter.

D. Student Data

1. Analyze the student data provided by the Office of Institutional Research (<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>) and other data as appropriate (for example: SARS-TRAK data, library student surveys).

- a. Please describe the program's dialogue about the student data. Where would one find evidence of this dialogue?

(This dialog should be occurring as you write your Program Review of 2011-2012. Examples of evidence may include: agenda or minutes from workshops or meetings, internal reports. Smaller programs may want to consider discussing their data with related programs, their Dean, the Institutional Researcher or, for academic programs, adjunct faculty in the program.) For each of these questions, click in the following box and begin typing. The box will expand as you type.

There has been dialog at Departmental meetings, held approximately twice per semester. There are no written minutes. Due to Health issues, only half of our two person department was available at any one time to complete the program review. Thus no multi party dialog occurred at this time.

- b. Please summarize what the program learned from the student data. How will these results be used for improvement/s and planning?

(Briefly discuss trends or significant findings regarding student retention, success rates, different cohorts of students, etc. Student data may suggest the need for changes in course offerings, scheduling, teaching methodology, outreach, processes, etc., or may lead to the creation of a new SLO/SAO.)

While Astronomy and Physics have 86% and 98% fill rates, respectively, the success rates were somewhat lower, averaging about 50% for astronomy and 80% for physics. We believe that 80% for physics, particularly in the first semester courses (2A and 8A) is appropriate given the time and skill demands of the courses, the success rates for astronomy is continues to be too low. Although this value actually represents an increase from 2007 – 2009, we believe that the problem is three fold:

- 1) too many students enter astronomy unprepared to tackle a college level science class—particularly one that deals with a relatively abstract topic with “hard science” origins. Attempts to address this concern by instituting a prerequisite or advisory in math, for example, have met with resistance in curriculum committee in the past. Success rates over the next year will determine whether this issue is again raised and possible prerequisites instituted.
- 2) Assessments, workload, and familiarity with the level of student understanding and ability vary considerably from one instructor to another. Many adjunct instructors, for example, do have not had much prior experience of teaching community college astronomy classes.
- 3) Distance Education students have a lower retention rate than on campus students, even for the same instructor. Part of the reason here is simply in the commitment of distance education students, who do not fully invest their time in the course and find withdrawal, or simply ignoring the course, to be a more compelling option than completing the course work.

4) Since Introductory astronomy class size is not limited by laboratory space, as with physics, many students have been added to astronomy classes after the start of the semester to allow students to fit in a science class when all options are already filled. Many of these added students are unprepared for the demands of a college level science class such as astronomy. As part of a campus wide trend, fewer (if any) students are being added after the close of the waitlist compared with past semesters.

c. To what extent, and how, do the student data results support resource requests?

(If relevant, briefly explain how your student data may be improved by acquiring new or additional resources (eg: faculty, classified personnel, instructional equipment, facilities) that you plan to request. You will be asked to provide more detailed information on the resource request forms; this is just a brief summary.)

N/A

2. Enrollment Management (Instructional programs only)

a. What total FTEF was approved for the program in 2012-13? This data is found in your Discipline Plans.

Fall 2013 3.21 FTEF, Spring 2013 2.76—total = 5.97

b. If this amount differs from 2011-12, describe what changes have occurred.

(To find Total FTEF for AY 2011-2012 consult the Enrollment Management data on the IR website. (<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>). If your allocation was less than the previous year, comment on the types of courses that were cut. If the allocation was more, indicate which classes were added and why.)

There is no change from 2011-2012

c. Describe and explain any changes you anticipate in course offerings for the academic year 2014-15.

We anticipate “splitting” our double section of physics 8A from one lecture section of 48+ students and two lab sections of 24+ students to two separate lecture/lab sections of 24 students. This will be require an increase of .20 FTEF per semester.

E. Human Resources (in AY 2011-12)

1. Please complete the following table.

(Enrollment Management data is posted on the IR website:

(<http://www.laspositascollege.edu/researchandplanning/ProgramReview.php>).

Total FTEF*	FTEF from Full-Time Faculty*	% FTEF from Full-Time Faculty **
5.94	3.12	53%

* If your program consists of multiple rubrics (eg: Anatomy, Ecology, Microbiology) sum values from all rubrics

- ** If your program consists of multiple rubrics, use the following equation to calculate the % FTEF from Full-Time Faculty: Divide the FTEF from Full-Time Faculty by the Total FTEF and multiply by 100.

Type of Personnel	Number	Shared? With whom? If shared, state % of time assigned to the program	No. of hrs/wk	No. of mo/yr
* full-time 20 hrs/wk (50%) to 40 hrs/wk (100%)		no		
		Click here to enter text.		
	1	Yes, shared with Engineering. Physics/Astro/Engineering	40	10
regular hourly classified staff**				
student assistants	1	Physics/astronomy (Paid through STEM Ed grant expiring 2014)	1.5-3	10

* full-time: 20 hrs/wk (50%) to 40 hrs/wk (100%)

** regular hourly: 18 or fewer hrs/wk (45% or less)

2. Will human resources be adequate for the academic year 2014-15?

YES

NO x

If No, briefly describe. Provide any data which support these needs.

There is currently not enough to support for astronomy. Our single lab tech uses the majority of his valuable time for engineering, physics labs, and club activities. Observational astronomy is admittedly time consuming, but two of our four high quality telescopes are in disrepair, and the dome is not useable. Lab tech is not available during night observing sessions. Student Assistant has been of help, however, but is not funded beyond Spring 2014.

3. Are there Staff Development needs for the academic year 2014-15?

YES

NO x

If yes, elaborate. Provide any data which support these needs.

Full time Instructors teach multiple disciplines. Instructors could use assistance and training in new techniques and technologies in both physics and astronomy. In particular, assistance with observational astronomy would be appreciated—expertise within the community can and should be “tapped” to aid in student use of telescopes and to simply make better use of our resources here, and in the future as the observatory is relocated.

Also, strategies for improving success rates in introductory astronomy classes, and hybrid labs for physics and astronomy can and should be addressed, possibly by attending specific conferences for distance education and/or introductory astronomy held nationwide.

F. Technological Resources

Are there any **new** technological needs for the academic year 2014-15?

(Do not discuss your existing technology, including replacements and repairs of existing technology. DO discuss new needs.)

YES NO

If yes, briefly describe. Provide any data which support these needs.

(Examples of relevant data might include: enrollment information related to the growth of your program, workforce demands/trends, obsolete or outdated equipment and/or software.)

G. Facilities, Equipment, and Supplies Resources

Are there any **new** facility, equipment or supply needs for the academic year 2014-15?

(In this section consider new facilities, equipment and/or supplies that are needed to support your program. This does not include your current items that need replacement. Definitions of these terms may be found in the glossary.)

YES NO

If yes, briefly describe. Provide any data which support these needs.

(Examples of relevant data might include: data on program's growth, change in curriculum, ADA regulations, etc.)

- 1) Observational astronomy program requires new site. New Athletic field lighting and M & O operations center have rendered current observatory location obsolete and inadequate. Likewise, new lighting throughout campus has made virtually all observations from the science building rooftop virtually impossible. Lighting at campus rooftop has increased by a factor of 5 compared with construction date of 1994. Lighting at Observatory has increased by a factor of at least 20 compared with construction date of 1998. A new site for the observatory on campus property is being researched. Selection, approval, and funding will require multi-level support.
- 2) Storage of physics, and Engineering equipment is now a problem due to loss of storeroom space for remodel of science building. A solution to this problem as not been identified.

H. Financial Resources

1. Is there a Program budget for the academic year 2014-15? (Include any co-curricular funds)

YES NO **If yes**, please briefly describe amount and general uses.

\$1800

2. Are there any **new** financial needs for the academic year 2014-15?*(Examples of new financial need might include: new funding needed for upcoming events, new initiatives, changes in curriculum that require new training beyond what staff development can provide, request for release time for something new, etc.)*YES NO **If yes**, briefly describe. Provide any data which support these needs.

Funding to move observatory and construct support for new location. Can be portable structures, requiring no fixed power or water source. Scope of project depends on funding. Can be accomplished at various levels from \$1000 to \$10,000. We will apply for a small project grant through the facilities committee to assist with this move.

I. Other information pertinent to the program.

In the space below, discuss any other information which is pertinent to the program. Examples include

- Internal or external impacts on program
- (e.g., mandates from state, curriculum changes in one program that impact another, loss of resources due to budget cuts, changes in college mission, goals, etc.)
- Other internal or external data *(data not discussed above)*

Click here to enter text.

III. SUMMARY**A. Summarize objectives accomplished since the Program Review Update (2012)***(The 2012 Academic Program Review Updates can be found on the Grapevine*<http://grapevine.laspositascollege.edu/programreview/ipr2010-11.php>*(Click on your discipline name.) Your brief discussion may include objectives accomplished since the 2010 program review, even if not discussed in the Update.)*

SLO's have created for all courses, and assessed regularly in at least one course. While still far short of our goals, this is a significant improvement over the 2010 status.

B Summarize objectives not accomplished since the program review update (2012) and why not.*(Your brief discussion may include objectives not accomplished since the 2010 program review, even if not discussed in the Update.)*

SLO's have fallen short, but have improved.

C. What are the objectives for the academic year 2014-15?

(Summarize briefly the objectives you plan to accomplish or begin in 2014-15. You will describe your plan to implement/achieve these objectives in the Program Effectiveness Plan in Part IV.)

Complete AST degree for Physics, Split double section of Physics 8A, improve retention and success in Astronomy 10, 20 and 30. Institute a physics/Astronomy coordinator position when FTEF becomes available.

D. For all needs identified in Part II, summarize how these needs will affect student learning/achievement and impact the program.

(This brief summary should capture the effects on students and the program if the needs are met or unmet.)

- A. FTEF increase to split 8A will improve student learning and retention in Physics 8A by providing more intensive support per student and decreasing "dilution" of resources. Splitting 45-48 student single lecture and two lab section into two separate 24 student lab sections will improve student learning and success by:
- 1) providing more time available per student for the instructor. Less time can be devoted to individual questions from students. At 45 or more students, little if any class time can be devoted to the problems a single student may be having. Office hours, and other activities are also more crowded, reducing the time available for students who really need it.
 - 2) Since the instructor is now teaching 45 students during the three hours he or she would be teaching 24 students in a split section, He or she will be grading 45 assessments, rather than 24, which limits the amount of feedback available, and the types of assessments that can be assigned.
 - 3) The most significant reason, however, is that the labs must be taught different in a combined lecture. When the 24 students have four hours lecture and three hours of lab, the lab can be used for remediation as necessary, problem solving, assessments, and activities developed "on the fly" to help with students learning. In other words, it is a flexible period that can be tailored to meet student needs and instructor concerns. When a large lecture is split into multiple labs, the labs must all be identical for continuity purposes, and such flexibility is rarely possible.
 - 4) Course was traditionally taught as split section and the combined section was a necessary but undesired response to decreased FTEF.
- B. Funding and support for new observatory location for astronomy will help astronomy students to learn the core concepts of astronomy laboratory, now unfeasible on campus with current lighting conditions.
- C. A coordinator for Physics and Astronomy program will help in student learning and success by integrating the efforts of various instructors, promoting staff development opportunities, assisting in development SLO assessments, and responding to SLO outcomes, coordinating meetings with staff to assure needed resources are available and implemented. In practice, Physics and astronomy are very time consuming subjects to teach, and even more so to innovate within. As a result, There is little or no

coordination within the physics and astronomy discipline as both full time and adjunct staff are too busy and too occupied with the specific needs of their own courses to address departmental and college wide concerns.

Continue to the next page to complete the form.

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Astronomy and Physics	STEM PS	Eric W. Harpell

IV. PROGRAM EFFECTIVENESS PLAN

Instructions: In the table below, indicate how you plan to measure the effectiveness of each objective summarized in Part III and the resources needed.

Suggested: 0-5 Objectives (focus on a few)

Rank	Priority 1=essential 2=important 3=nice to have	Objective	SLO's/SAO's linked to objective	College goal(s) linked to objective ‡	How will effectiveness be measured?	Category*	Resources needed	Committee
1	1	Split Physics 8A sections	Click here to enter text.		Retention/success	Enrollment management data	FTEF	Click here to enter text.
2	1	Move Astronomy observatory	Click here to enter text.		Fill rate, retention, SLO for Astronomy 30	Enrollment management data SLO	Funding and administrative support.	Click here to enter text.
3	1	Improve success in introductory astronomy	Click here to enter text.		Success rate	Enrollment management data	Staff development, administrative support.	Click here to enter text.
4	1	Create coordinator position for physics and astronomy	Click here to enter text.		Success rate, higher SLO assessments, fill rate, change in course curriculum	Enrollment management data,	FTEF	Click here to enter text.
5	Click here to enter text.	Click here to enter text.	Click here to enter text.		Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

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*human, technological, facilities/supplies, financial, other

‡When College Goals become available, this column will be activated.