Skyline College
Physics/Astronomy
Program Review
Executive Summary

Short Summary of Findings

Since the last program review, the physics program has moved into a more spacious lab room and received a large upgrade in state-of-the-art equipment and computing facilities. This has enabled us to handle a huge population boom while improving our high quality instruction. The program has nearly doubled its total section offerings in the past two years (with even more offerings on the way), but we have been able to simultaneously lower our student-to-equipment ratio. We have started to standardize the lab curriculum to provide a more uniform experience in a larger program. The one item we sorely lack is a second full-time faculty member. In the last several decades, we have never had this many students, nor this few permanent faculty members.

Three Strengths of the Program

- New larger lab room with excellent equipment, computing facilities, student-to-equipment ratio.
- Has been able to accommodate huge growth without sacrificing high quality education.
- Serves some of the most highly motivated Skyline students pursuing technical, life science, and health related fields.

Three Suggestions for Improvement

- New full-time faculty member is absolutely essential.
- Further standardization of lab curriculum (lab manuals).
- Catching up on SLO Assessment Cycle.

Full-Time Faculty Signatures

Ilkka Koskelo	*Highlight this text & type in name*	*Highlight this text & type in name*
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Submitted on: April 1st, 2009

SKYLINE COLLEGE
PROGRAM REVIEW SELF STUDY

PART A: Mission Effectiveness

Overview

1. State the goals/ focus of this program and how the program contributes to the mission and priorities of the College and District.

Goals and Focus:

• To provide lower division physics courses that our students can transfer to their four-year institutions, and which prepare our students fully for their upper division course work.

• To allow transferring students to fulfill their necessary physical science proficiency requirements.

• To provide a foundation to understand the role of physics and physical thinking in applied subject matter areas such as engineering, architecture, biology, and chemistry.

• To expand the use of technology and new pedagogical methods in the teaching of physics.

Contribution to the Mission and Priorities of the College:

• The physics program provides lower division transfer programs which prepare students for continued education in four-year colleges and universities. Most of our students who complete the physics 210-220 sequence transfer to four-year colleges to study life sciences (biology, etc) and pre-health (pre-med, pre-dental, pre-vet, physical therapy, etc). Most of our students who complete the physics 250-260-270 sequence go on to study pure science, engineering, or computer science.

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2. Discuss how this program coordinates, impacts, and/or interacts with other programs in the College.

With the mathematics program:

Physics 250-260-270 sequence:

• These students also take the Calculus sequence, Math 251-252-253. It is doubtful whether either of these sequences could exist without the other. The engineering and physics students need to be as proficient in advanced mathematics as students who plan to major in the subject, and are a major component to its enrollment.

Physics 210-220 sequence:

• These students need to complete the Intermediate Algebra sequence as well as Trigonometry (Math 130) as pre-requisites. The latter is a new pre-requisite as of Spring 2008, to bring the course pre-reqs in line with our transferring institutions, further intertwining the math and physics programs.

• Many of these students also take Precalculus and one or two semesters of Calculus (Math 241-242 or Math 251-252) along with our Physics 211 and 222 supplement courses, as required by transfer institutions. This allow students to satisfy a physics-with-calculus requirement for biology majors transferring to UC campuses.

With the chemistry program:

Also, the physics and chemistry curriculums (particularly General Chemistry 210) often reinforce different aspects of the same subject areas (study of atoms, phases of matter, thermodynamics, etc). This cross-over benefits all students who take these courses as part of a broader lower-division science education.

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3. Explain how this program meets the needs of our diverse community.

The physics program supplies the graduation and transfer courses needed by those students who are appropriately prepared. It should be noted that, in large part, the students who take the courses in our department are at the sophomore or higher level and have already needed to pass several difficult mathematics courses as pre-requisites. We therefore see a select group of students enrolling who are already highly motivated and advanced in their studies. In conjunction with the MESA program, the science program at large is able to attract and retain students who traditionally would have bypassed the program.

In order to reach an even broader spectrum of the Skyline community, we also propose to develop a GE (General Education) "Conceptual Physics 101" course. Like most two-year colleges, Skyline has a high percentage of students whose preparation and experiences in math and science are very limited. This course would have little or no math pre-requisites, and would be focused on generating interest and literacy in physics. It will give opportunity for students to gain confidence and experience with science, so that they might become interested and encouraged to do a more advanced math/science curriculum.

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4. If the program has completed a previous self-study, evaluate the progress made toward previous goals.

Below is a summary of the proposed goals/tasks outlined in the previous program review, and a brief synopsis of what has been done towards each since then:

a.) *Moving into building 7 (temporary facility) and back to building 1 (after renovation).*

The move to our temporary home in building 7 occurred in summer 2007. In addition to the faculty offices, we transported the entire physics stockroom and organized it for use in a temporary space. We also set up a lab room with appropriate lab benches, computers, printers, and a wireless internet network. A similarly major undertaking was completed during winter break 2008/09 to move back into the newly renovated physics lab and stockroom in building 1.

The previous program review also mentioned needing to expand the lab room, to create room for the program to expand. This was indeed accomplished—the new lab room has more lab benches than we had been able to previously fit, opening up room to admit a significantly larger group of students. This larger space, along with our opening of night labs, has greatly increased the total number of students we can accommodate in our program comfortably.

b.) *Need to purchase new equipment*

Much additional equipment has been purchased since my arrival. Most notably, a large equipment budget came along with the building 1 renovation, which the physics program used for major upgrades. During the move back into building 1, a large amount of equipment was received. This included:

• *New equipment:*
We received some of the latest state-of-the-art physics instructional equipment, which we did not have previously: either due to previously being beyond our budget, simply not yet being available, etc.

• *Replaced equipment:*
We replaced some old equipment which was broken, unreliable and/or unsafe, or simply not as pedagogically effective as newer equipment on the market.

• *Expanded equipment:*
We increased the quantity of some equipment we already had, so we could expand the number of set-ups run per lab section. This allowed us to accommodate growth in the program while maintaining a reasonable student-to-equipment ratio. The size of lab groups has actually decreased from 4-5 students per equipment set-up to 2-4 students, even while being able to accommodate more students.

• *Computer equipment:*
At this time, we also received a full complement of student laptops, which replaced our very outdated machines. We also doubled the amount of student computers, which allows us to halve the student-to-computer ratio for far better pedagogy. Never in the history of our program has such a low student-to-computer ratio been achieved. We have also implemented a high quality wireless internet and printer network.

With the aforementioned largely fulfilled since the last program review, our facilities space and equipment needs are no longer limiting factors to our program's growth. Even as our program grows, we have been able to achieve the best student-to-equipment and student-to-computer ratios as we have even had in the program.

Only major limiting factor to our program's further growth remains. This issue was also mentioned in the last program review, but has yet to be resolved:

c.) *Hire a new full-time faculty member*
In the last program review, my immediate predecessor mentioned the strong need to hire a second physics faculty. When he retired, a full-time faculty member was indeed hired (myself), but the spirit of the recommendation remains—we need more than one person to run this program, which is expanding even more rapidly today than it was a few years ago. The program had more than one full-time faculty member for most of the last three decades, but in this time of huge growth, we only have one. We need another full-time faculty more today than when this recommendation was last made.

PART B: Student Learning Programs and Services

Overview

1. If the program utilizes advisory boards and/or professional organizations, describe their roles.

I am the faculty advisor for the Skyline chapter of the Society of Hispanic Professional Engineers (SHPE). Through this conduit, I can learn about internship and career opportunities for all students. This student organization also has strong ties to MESA (Math Engineering Science Achievement).

I am also an active participant and instructor for the Pre-Health Certification Program at San Francisco State University, so I am able to receive pertinent and crucial information for pre-health and life sciences students about transferring, MCAT preparation, etc, and pass it forward to the students at Skyline.

I have also been active with the Bridges to Baccalaureate program at San Francisco State, which seeks to stimulate dialogue and strenghten the links between Skyline and SFSU, and have been periodically involved with the American Association of Physics Teachers (AAPT).

Curriculum

1. ***Describe how the courses offered in the program meet the needs of the discipline(s) and the students. (This may be answered through descriptive narrative evaluation or quantitative research).***

The courses offered in this program are standard offerings for lower division physics courses. With minor variations, these courses are offered at other community colleges both in the district and elsewhere, and also at the four year institutions we transfer students to.

Most of the students in the calculus-based sequence go on for engineering degrees or computer science, and some for pure science degrees. Most of the students in the algebra-based sequence go on for degrees in life science or health related fields, such as biology, chemistry, pre-medical, pre-dental, or physical therapy.

There are strong indicators that transfer students are served well by the program. Having taught for years at San Francisco State University before coming to Skyline, I can most assuredly state that the quality of our course offerings is as high quality as any corresponding course offered there. We have many students who are accepted into prestigious four-year institutions, often with excellent scholarships, and excel there. No formal follow-up survey has ever been conducted by the physics program specifically, but the anecdotal evidence is very strong. The MESA center often tracks this data for all science students, at least informally.

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2. ***State how the program has remained current in the discipline(s).***

The fundamentals of lower division physics have not changed in the recent past—the nature of the subject matter makes it more static than some other disclipines. However, pedagogy within the discipline has evolved greatly, particularly in how technology is used to facilitate learning. Research in physics education suggests new ways to approach some physical concepts. We have kept up with these new approaches in the following way:

- *Textbooks:*

I have obtained and reviewed most new textbooks appropriate for our sequences as they are published. I have reviewed their pedagogical methods for possible improvements in my own lecture notes, and have adopted new editions or new textbooks for use in our courses, as appropriate.

- *Web-based instruction:*

Using the internet to post course materials and using web-based applications for homework submission is becoming standard. The students can get whatever course materials they need from anywhere with an internet connection, which helps those with difficult schedules keep up with the course. Both the immediacy and multiple attempts allowed on the on-line homework system (WebAssign) gives students immediate positive feedback and increases student learning. The system has proved very popular with the students.

However, every such on-line system needs a steady experienced hand to keep technical problems at bay. I was one of the earliest adopters of WebAssign (now the market leader), and have kept up with the most advanced features of this system as they are implemented, via newsletters, and direct phone/email interaction with many of their staff.

• *Laboratory:*
New lab equipment and data acquisition software on the market becomes ever more available and affordable. We have stayed informed on the latest products from the major instructional equipment companies (Pasco, Sargent-Welch) and obtained new equipment whenever deemed appropriate and funding is available.

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3. If the student population has changed, state how the program is addressing these changes.

The growth in our student population is tremendous, and we have accommodated that boom by opening up more lab sections. As an example, we are offering 23 sections in the current 2008/09 academic year, vs. 15 sections in 2006/07 and prior, before I arrived. We expect to offer 25-26 sections in 2009/10.

The Physics 210-220 sequence in particular has seen tremendous growth, to meet the need of the rapidly increasing pre-health and life science majors. A few years ago, we offered two sections of Physics 210 in the fall only, and single section of Physics 220 in the spring. We are now offering 2-3 sections of each course every semester.

We have also doubled the number of lab offerings per semester for Physics 250, and will be opening up a second daytime section of Astronomy 100 year-round, starting fall 2009. We also plan to develop and offer a GE conceptual physics course, as discussed above in Part A (Overview, #3). We previously only offered daytime labs, but have begun to hold many night labs, which have proved quite popular. Many students who work while attending school find them convenient, and they usually fill up as fast as any daytime offering.

More quantitative data on this enrollment boom is detailed on the Data Reporting Sheet.

We have needed to make major adjustments in order to expand our lab offerings, chiefly by rigorously standardizing our lab curriculum in the form of lab manuals:

My two predecessors did various lab activities on an ad-hoc basis, which worked since they were able to teach all of their own labs, and the laboratory component was also somewhat de-emphasized. Now that I am the only full-time faculty, and enrollment is way up, we have needed to make much more use of part-time faculty to teach labs. With various part-timers coming and going, and having different instructors teaching various lab sections simultaneously, it therefore falls on me to make sure that the lab experience is both structured and consistent for the students. Having established lab manuals for each class becomes a necessity in this type of environment.

With the aid of a Trustees Grant, I was able to write two 100+ page lab manuals for Physics 210 and 250, the entry courses in each of our physics sequences (non-calculus and calculus-based). These have proved very successful in providing consistent quality lab instruction, and this now serves as the template for the rest of the courses. We plan to develop similar manuals for the rest of our courses.

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4. All courses in this program should be reviewed for currency and modified every six years. If this has not occurred, please list the courses and explain.

All courses in the program were reviewed for currency during this program review cycle. The modified course outlines submitted with this program review reflect these changes.

All courses now have Student Learning Outcomes included, which I believe was not a state requirement at the time of the last program review.

Some ambiguities in the course content and pre-requisites was also clarified. Math 130 (Trigonometry) was added as a Physics 210 pre-requisite since the last program review, to bring it into alignment with the corresponding course at transfer institutions.

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5. If external accreditation or certification is required, please state the certifying agency and status of the program.

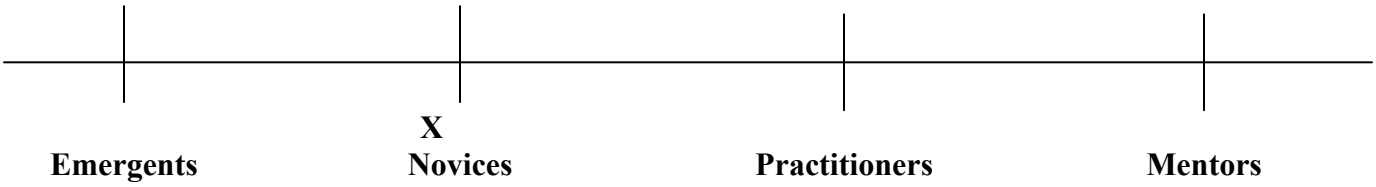
There are no external regulations with which the physics program must comply.

Student Learning Outcomes & Assessment

1. Where on the continuum do you believe your department is on the SLOAC Initiative?

Emergents	Novices	Practitioners	Mentors
• Learning and discovering • Gathering information • Attending workshops	• Beginning a dialogue • Drafting SLOs • Drafting assessment plans • Taking inventory of assessments • Creating instruments for assessment	• Engaging in widespread dialogue • Implementing assessment plans • Refining SLOs • Reviewing outcome data and discussing implications	• Facilitating discussions and generating new dialogue • Conducting workshops • Lending assistance

Mark an X on the continuum and briefly comment.



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2. Highlight any major findings and resulting course or program modifications.

I have inserted Student Learning Outcomes into all of our course outlines as of this program review. We have not yet been able to draft any assessment plans, but have applied for a Trustees/PFE Grant which hopes to (along with several other important program improvements) catch our program up with comprehensive SLO assessment plans by the end of summer 2009. I understand that applicants to this grant are encouraged to apply the funding towards this purpose. We would then move on implementing assessment plans for fall 2009.

After drafting assessment plans and implementing them, we will be able to detail any major findings and modify courses as needed.

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3. What additional resources are needed to implement the plan?

See question above; our only impediment to assessment plans is time—there are so many improvements for the program left to do, and only one full-time faculty member to do them. Funding from a grant and/or having another full-time faculty member would greatly help expedite SLO assessment.

PART C: Resources

Faculty and Staff

1. ***List major development activities completed by faculty and staff in this program in the last six years and state what development is needed or proposed by faculty in this program.***

Much of this was detailed in the Part A (Overview, #4), as the activities I have needed to complete were anticipated in the last program review by my predecessors—moving facilities, obtaining new equipment and computers, etc. Also, as mentioned above in Part B (Curriculum, #3), I have completed some major standardization for our laboratory curriculum, and written Student Learning Outcomes into the course outlines.

Further work is also required in these areas:

• *Lab manual development*: Previously discussed in Part B (Curriculum, #3)

• *SLO development:* Previously discussed in Part B (Student Learning Outcomes, #2)

• *Conceptual Physics course development:* Previously discussed in Part A (Overview, #3)

2. ***Describe the orientation process for new faculty and staff (include student workers such as tutors and aides).***

General orientation for new faculty is done by the division office (Dean Mike Williamson et al). I orient new part-time physics faculty from there. I stay in constant contact with new instructors through their first few semesters of teaching, to make sure that they have everything they need for instruction, have all their questions/concerns answered, and are teaching effectively. As mentioned above in Part B (Curriculum, #3), I have written lab manuals for some labs already, which takes the burden of proper curriculum development and consistency largely out of the hands of the part-time faculty.

3. ***If recruitment of new and/or diverse faculty is needed, suggest recruitment techniques.***

Due to my continuing work at San Francisco State University, I have an inside track on graduate students and lecturers who would be outstanding hires for part-time faculty for Skyline. We have already used this to great advantage. Other places to post job openings are CCC Registry (also already being used to recruit part-timers), as well as Physics Teacher magazine and the Phys-L mailing list.

Facilities, Equipment, Materials and Maintenance

1. ***Discuss the effectiveness of the facilities, equipment, equipment maintenance, and materials for the program to meet its goals and focus. Include if they impact success and if they are accessible to all students.***

As mentioned above in Part A (Overview, #4), we are in great shape with our facilities, with the recent Building 1 renovation. We now have an adequately large lab space and enough properly functioning equipment and computers to serve the students quite well. This equipment is used by all of the students in our lab courses, and also provides the instructors effective lecture demonstrations. The new facilities and equipment vastly improve the pedagogy of our program.

2. List projected needs.

Full-time faculty:
As has been stressed above and in the data reporting, the one item which has not kept pace with our program's growth is the number of full-time faculty. In recent years we've only had one full-time faculty (the lowest amount in many decades) while our enrollment is the largest it has ever been.

Lab technician:
We will only need more help with setting up and repairing lab equipment as our program grows. We currently have a student doing this part-time, but should formalize this position further in the future.

Equipment:
While we now have the vast majority of equipment we need, we will undoubtedly discover some further items are required:
- As we put the very recently arrived equipment through its paces, we will likely discover that ancillary gear is needed, which would have been difficult to anticipate in advance.
- We will need to replace equipment from normal wear-and-tear.
- A few experiments have not yet been expanded to a full complement of set-ups.
- Some additional advanced equipment will be necessary if we are able to hold more honors sections.
- Computer technology goes out of date quite rapidly, so we will need to keep pace.

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3. Describe the use of technology in the program and discuss if technology is current and comparable to other college and business or industry.

Physics is inherently technological, so lab improvements keep the program current with technology. Web-based pedagogy is kept current; see Part B (Curriculum, #2) above.

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4. If appropriate, describe the support the program receives from industry. If the support is not adequate, what is necessary to improve that support?

The Physics department does not depend on industry for direct support. The MESA program and I keep an eye our for student internship opportunities in industry and make them known to the students.

Budget Request

1. What resources (staff, facilities, equipment and/or supplies) will be needed in the next six years?

See item #2 immediately above—Projected Needs. We will need to hire another full-time faculty member and other staff. A small equipment budget will also be needed.

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2. If appropriate, discuss methods the program could share resources with other programs in the College and District.

The physics program and chemistry program often share measuring equipment (scales, beakers, rulers, etc.). It should be emphasized that other classes should never be scheduled in the physics lab, since equipment often must be left set up to accommodate multiple sections.

PART D: Leadership and Governance

1. What leadership roles do the faculty and staff of your program hold in the college?

I am the faculty advisor for the Skyline College chapter of the Society of Hispanic Professional Engineers (SHPE). This is a diverse multi-cultural group of students who regularly attend professional

meetings, take tours of local technology companies to find out about job opportunities, and hold fund-raising events.

I also serve on the Science/Math/Technology Division's Scholarship selection committee.

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2. How do the faculty and staff in your program participate in the governance processes of the college/district?

I am not an active participant in the governance process at this time, but stay updated via newsletters and emails.

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3. How do the faculty and staff in your program exercise initiative/leadership in improving practices and services related to the program?

Implementing the many improvements to the program has been entirely of my own initiative.

PART E: Action Plan

1. Describe the program's plan for addressing areas of improvement.

Full-time faculty: A new hire rests largely outside of my hands, aside from strongly recommending that one is necessary.

Part-time faculty: I have been engaged in active recruitment to find the best part-time faculty, per the methods described above in Part C (Faculty & Staff, #3), along with the Division Dean.

New course development: To get our proposed Conceptual Physics course started, we plan to develop a course outline as the first step towards articulation. We hope to have it offered by Fall 2010.

Equipment/lab manuals: Improvements to the laboratory curriculum are ongoing. I plan to continue my work in developing standardized lab curriculum and lab manuals, extending the template from Physics 210 and 250 to all of our lab courses. Some small amount of additional equipment may end up being required for existing courses. New proposed courses, including the Conceptual Physics and any new honors labs, would also need equipment. I will continue to apply for grants and release time to make these major overhauls possible, and doing whatever I can within the equipment budget and time I have available.

SLO Development: This is also an ongoing process also, only limited by time. We hope to have drafted assessment plans by the end of summer 2009, and implement assessment by fall 2009.

Skyline College Program Review
Worksheet for Enrollment, Performance and WSCH/FTE

Weekly Student Contact Hours – WSCH

Report the 3 previous **Fall** semesters with the most recent on the right.

Year	2007	2006	2005
WSCH	812	733	699

Please comment on program enrollment and expected trends.

See Section 1 below. I cannot paste auxiliary data into this space.

FTE and WSCH/FTE (LOAD)

Report the previous 3 **Fall** semesters with the most recent on the right

Year	2007	2006	2005
FTE	1.67	1.47	1.47
WSCH/FTE	487	500	477

Please comment on the comparison of this program to College trends.

See Section 2 below. I cannot paste auxiliary data into this space.

Retention and Success

Report data on program retention and success rate with the most recent on the right.

Year	2007/08	2006/07	2005/06
Retention	81%	79%	84%
Success	69%	69%	74%

Please comment on the programs success and retention rate. Include factors that affect the rates and how college services are used to provide multiple avenues for student success.

See Section 3 below.

Section 1: Weekly Student Contact Hours (WSCH)

Though it is the last semester asked for, fall 2007 was actually my first semester at Skyline; during nearly all of this six-year program review period, the physics program was helmed by two full-time faculty who were both retired by spring 2007. Therefore, to better evaluate recent trends, I would like to include more recent data. This includes up through fall 2008 (actually outside the program review boundaries) as well as spring data, as our fall/spring offerings are very similar.

After my arrival----------| Before my arrival----------|

	F08	Sp08	F07	Sp07	F06	Sp06	F05
WSCH	1268	1042	812	750	733	817	699
Sections	12	9	8	8	7	6	7
FTES	42.25	34.72	27.05	25	24.43	27.23	23.3

The above data shows a relatively constant WSCH until fall 2007, and then a marked surge in recent times. This is because we have opened up many more sections since my arrival—and have filled them. I have also included the number of sections offered, and full-time equivalent students to corroborate this—both have markedly increased. We have nearly doubled the FTES we serve.

This growth continues in the current semester (Spring 2009 –12 sections offered), and will increase further in fall 2009 and beyond, as we open up further lab sections and new course offerings; see Part B (Curriculum, #3).

The above data will also be presented in graphical form at the program review presentation.

Section 2: FTEF and Load

Again, more recent trends are included below, so these statistics are meaningful to the current state of the program:

After my arrival----------| Before my arrival----------|

	F08	Sp08	F07	Sp07	F06	Sp06	F05
FTEF	2.25	1.93	1.67	1.83	1.47	1.47	1.47
Load	564	539	487	411	500	557	477
Actual Full-time Faculty	1	1	1	1	1	1.5	1.5

FTEF:
The number of faculty needed to teach the increased offerings has needed to keep pace with these new offerings, with recent trends tending to crest to over 2 Full-time Equivalent Faculty. We expect this to increase further with new offerings.

Note that there were 1.5 full-time faculty members for the last several decades (ending in 2006). Now with all-time record enrollments, and with room for 2+ full-time faculty, there is currently only one. I have needed to coordinate far beyond my own duties, to provide a uniform lab experience for the students taught by various part-time faculty. We need another full-time faculty member.

Load:
The load figure fluctuated around 500 before my arrival. This is actually overestimated-- my predecessors would often do labs only biweekly, alternating two groups of students, which allowed them to double their enrollments. When I arrived in fall 2007, the load dropped slightly for one semester, due to a readjustment of the WSCH, since I required all students to complete a lab every week. Normal statistical fluctuation undoubtedly also played a role.

After that time, the Load has grown steadily and has even exceeded the previous inflated values, truly showing a program in growth. This indicates we are filling the classes we offer.

(Note: The absolute load number cannot be compared to the college average, as the methodology used in computing loads causes lab courses to score lower. A better parameter to examine is our fill rate, which is near 100%. However, the load figures can be used to clearly track trends within our program.)

The above data will also be presented in graphical form at the program review presentation.

Section 3: Retention and Success

Our retention and success statistics are very much in line with the college averages. We receive some of the best prepared students into our program, since we have math pre-requisites for most of our courses. We challenge them to a further level of academic excellence.

Our retention and success rates within the tracked ethnicity categories are the same as among the college as a whole, when we have enough students enrolling to be able to draw statistically significant conclusions. African-American and Hispanic students have traditionally had low enrollments in our program compared to the college as a whole.

However, a recent positive trend has been an uptick in Hispanic student enrollment. This may be due to some positive effects of outreach by others in the lower level courses. Their success rate in our program appears to be commensurate to the college as a whole, as anyone who is eligible to enroll in our classes must be well-prepared upon arrival. However, it is too early to draw a multi-year trend at this time.

There is no gender gap in our success rates. Both men and women have about equal success rates in our program, in line with college-wide figures.

COURSE OUTLINE, PREREQUISITE, & STUDENT LEARNING OUTCOMES CHECKLIST

1	2	3	4		5	6	7	8	9	10	11
Prefix & Number	Title	Review Date	Transfer		G.E.	Prerequisites, Corequisites, Recommendations	Validated	SLOs	Assessment Plans	Implementation	Reviewed
			CSU	UC & CSU							
Physics 210	General Physics I	2008	X	X	X	Pre-req: Math 130	X	Y	N	N	n/a
Physics 220	General Physics II	2003	X	X	X	Pre-req: Phys 210	X	Y	N	N	n/a
Physics 211	General Physics I – Calculus Supplement	2003	X	X	X	Pre-req: Math 241 or 251 Co-req: Phys 210, Math 242 or 252	X	Y	N	N	n/a
Physics 222	General Physics II – Calculus Supplement	2003	X	X	X	Pre-req: Phys 210, Math 241 or 251; Co-req: Phys 220, Math 242 or 252	X	Y	N	N	n/a
Physics 250	Physics with Calculus I	2003	X	X	X	Pre-req: Math 251 Co-req: Math 252	X	Y	N	N	n/a
Physics 260	Physics with Calculus II	2003	X	X	X	Pre-req: Physics 250, Math 252	X	Y	N	N	n/a
Physics 270	Physics with Calculus III	2003	X	X	X	Pre-req: Physics 250, Math 252	X	Y	N	N	n/a
Astronomy 100	Intro to Astronomy	2003	X	X	X	n/a	X	Y	N	N	n/a

Program Review - Resource Needs Summary Table

Program : Physics/Astronomy

	Needs	Notes
Personnel	1. New Full-time Faculty Member 2. Lab Technician 3. Various part-time faculty 4.	
Equipment	1. Further instructional lab equipment 2. Further computer upgrades 3. 4.	
Facilities	1. Maintaining existing facilities and computing. 2. 3. 4.	

APPENDIX C
SKYLINE COLLEGE

INSTRUCTIONAL AND STUDENT SERVICES PROGRAM REVIEW

RESPONSE SHEET

Discipline: Physics/Astronomy

Thank you for your time and effort in preparing this Program Review. Your Executive Summary, with recommendations, has been sent to the Planning/Budget Committee and the Board of Trustees.

College President

Comments:

_____
Signature

Separate boxes for each

College Vice Presidents

Comments:

_____
Signature

Curriculum Committee

Comments:

_____
Signature

Original to remain with self-study
Copies to Planning/Budget Committee & Program Review preparer

Appendix D
Skyline College

Evaluation of the Program Review Process

To improve the Program Review process your help and suggestions are instrumental. We ask that all parties responsible for preparation of this review have input into the evaluation. After completion of the Program Review process, please take a few moments to complete and return this evaluation to the chair of the Curriculum Committee.

Estimate the total number of hours to complete your Program Review: 25 hours

1. **Was the time frame for completion of Program Review adequate? If not, explain.**

Yes.

2. **Was the instrument clear and understandable? Was it easy to use? If not, explain and offer suggestions for improvement.**

Mostly. The forms on the Word files were unduly restrictive. Items should be numbered sequentially from start to end, so they can be easily referenced from other questions, especially since several questions covering the same ground were widely separated on the form.

3. **Were the questions relevant? If not, please explain and offer suggestions.**

Order of questions within document would work better in this order: 1.) what have you done?, 2.) what do you plan to do?, 3.) how does this line up with past program reviews? The latter question appeared first, stealing the thunder about action plans asked about later. Also, not until the final question of the self-study is the opportunity presented to give a free response to question #2: essentially, what do you plan to do in the future to improve the program?

4. **Did you find the Program Review process to have value? If not, please explain and offer suggestions.**

Yes.

5. **Was the data you received from administration complete and presented in a clear format? Would you like additional data?**

Yes—I was able to lend statistical certainty to perceived trends in enrollment growth and faculty load. It would be very helpful to receive the data in an Excel spreadsheet, so I don't need to retype it into the computer to analyze it. Giving the percentages of each ethnicity enrolled in the program would also be helpful to track these trends. Also, providing a program fill rate would help to demonstrate that a program needs to expand.

6. **Please offer any comments that could improve and/or streamline Program Review.**

See above.