EL CAMINO COLLEGE
NATURAL SCIENCES DIVISION

INSTRUCTIONAL PROGRAM REVIEW
ACADEMIC YEAR: 2004-2005
DEPARTMENT: PHYSICS

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I. Overview

A. Description of Program

The Physics program is a multifaceted program serving the needs of students majoring in science to general education. For majors in Engineering, Physics, Chemistry and Mathematics, the Physics department offers four courses: Physics1A- Mechanics; Physics1B-Fluids, Heat, Sound; Physics1C-Electricity; and Physics 1D -Optics, Modern Physics. This unique sequence provides science majors a strong foundation in …..

Physics 13 is designed as a preparatory course for Physics 1A to build student's problem solving skills. Unfortunately there have been problems with enrollment so the class has not been offered in the last four years. Efforts are in progress to offer at least one section during the second half of the semester.

Several pre-professionals majors, architecture, life sciences, physical therapy and engineering technology require physics in their preparation. The Physics department offers two sequences depending on the requirements of the transferring institution. Physics 2A and 2B are an algebra-based physics sequence including mechanics, fluids, heat and sound, electricity, optics, and modern physics. Physics 3A and 3B are a calculus-based sequence covering the same topics as Physics 2A and 2B.

The department offers a 3-units lecture course on conceptual physics (Physics 11), and a supporting a one-unit laboratory course (Physics 12). These non-mathematical based courses are offered to meet requirements of transfer students in non-science majors.

B. Status of Previous Recommendations

The Instructional Program Review Department/Program Self Study report for the academic year of 1993-1994 was accessed for this current program review. There were 23 recommendations made by the Self-Study Team for the improvement of the physics department program. Most of the 23 recommendations are listed below along with a summary of their status. Recommendations dealing with facilities improvements are not included since the physics area was remodeled recently, making those recommendations irrelevant.

1. *We should try to attract more good high school students as ECC engineering and physics majors. The engineering program should be revived.*

   Attracting more good high school students continues to be an important goal of the physics department. We need to do more to interest good high school students from our district in coming to ECC for majors in engineering, physics, computer science, mathematics and chemistry. The members of the physics department should consider joining ECC recruiters in their visits to local high schools to help attract students majoring in the subjects mentioned above.

The Mathematics Division offers now two engineering courses. This revival of the engineering program could help attract high school students that are considering engineering as a career. In addition, the Industry & Technology Division is creating an engineering technology program in conjunction with local industries which will increase the number of students taking Physics 2A.

2. *Better coordination is needed between topics in mathematics and physics courses*.

   Coordinating between topics in mathematics and physics courses has proven to be very difficult. The problem continues to be discussed occasionally amongst some members of both departments. Most physics teachers have opted to teach mathematics topics, as needed, when these topics have not been covered in mathematics classes.

3. *The Physics 2B labs need to be standardized, and a manual prepared. New equipment, such as oscilloscopes, is needed to modernize this lab.*

   The members of the department have written a lab book for the Physics 2B and the Physics 3B course. We have purchased oscilloscopes and other equipment that has helped us modernize these labs. Many of the labs seem to appeal to students but much work is continually needed to improve the labs and to make up more interesting labs that can be done with reasonably inexpensive equipment by students with little experience, in 3-hour period.

4. *We need to be able to get meaningful statistical information about how our students do after transferring to UC and CSU, in comparison with other transfers.*

   The department believes that it would be useful if we could obtain meaningful statistics from 4-year schools about our transfer students. This information would give an indication of the effectiveness of our courses and would allow us to focus more accurately on needed improvements. We need to know how our students are doing, compared with transfer students from other community colleges and from lower-division, at the 4-year school, and how their GPA's in their upper-division major courses compare with their math-physics-chemistry grades at ECC. We also need to know how these results vary for students who took the complete lower-division program (pre-professional or pre-engineering/science) at ECC and students who transferred after only one or two math courses at ECC. We requested that information in the past, but they will not or cannot supply it.

5. *More tutors and more skillful ones are needed to help students who need review work in courses they are enrolled in.*

   The department of physics has had, for the past few years, excellent tutors. Jan Ball, of the tutoring center, has done an outstanding job hiring highly qualified tutors. At the moment, however, we only have one physics tutor since the second tutor, Natalia Lev, is no longer tutoring and is now an adjunct instructor.

The MESA program provides our students with peer tutoring and with a place where students can study in groups. The MESA program has been important, and sometimes crucial in the success of some of our students.

6. *Closer coordination is needed between counselors for engineering-physical science transfer and the Physics Department.*

   There is more and improved communication between mathematics and engineering/physical science counselors and the members of the physics department; also between these counselors and students. One of the reasons for improvement is that counselors are easily accessible at the MESA center where they are available to faculty and students several times a week.

   Students report that counselors other than those in engineering/physical science have advised some of our students to transfer to 4-year schools as soon as possible after having completed the maximum number of transferable units without regard to their readiness to transfer as determined by their grades in science courses and the science courses they have taken. We believe this advice is not in the best interest of the students. Transferring under those circumstances may put the students at a disadvantage because of lack of background in science.

   Even though members of the physics department communicate well with mathematics and engineering/physical science counselors, practically no communication exists with counselors who work in other areas.

7. *Technicians' job list should be extended to include being available for the first hour in 1C and 2B labs to assist students with electrical equipment when the instructor cannot get around to all groups needing help.*

   Dan Wright, our new physics technician, has been available to provide assistance to students during lab time; however, this item has not been included in the official job list.

8. *We should try to increase the number of full-time instructors teaching evening classes and reduce part-time. We should prepare booklets containing all the information needed by new and part-time instructors to insure adjunct staff maintains standards agreed upon by the department.*

   We believe that the physics department is adequately staffed. The department added a new full-time instructor this school year. Adjunct faculty has maintained standards tacitly agreed upon by the members of the physics department.

9. *Evening-class instructors should keep at least one (paid) office hour per week for each class they teach.*

   The physics adjunct faculty is devoted to teaching and works to ensure students success. Some of these instructors offer at least one office hour per week to students.

We believe the physics program would benefit if each adjunct instructor would have at least one paid office hour per week but recognize this is a negotiable item.

11. *Other ways should be found for faculty to keep up in their fields, so time lost to Flex Days can be returned to teaching. Teachers cannot cover material in course outlines with 3-6 hours lost.*

    No progress has been made on this recommendation.

12. *Changes need to be made in the present evaluation of probationary teachers. The process occasionally lets through teachers who turn out, after receiving tenure, to be unsatisfactory.*

    At present, all full-time instructors are satisfactory to the department and recognize that this is also a negotiable item.

13. *A departmental policy is needed to insure that lecture-lab rooms are not left in a disorderly state after use by some instructors.*

    There is presently good communication among all members of the physics department. Any conflict of the kind stated in the recommendation can easily be resolved between the involved parties.

15. *The low budget for physics equipment for several years has prevented the department from ordering any new equipment needed for modernizing lab work and introducing at least one computerized experiment in each course. We cannot attract good students in the laboratory courses like physics if we have no reasonably modern, not to say high-tech, equipment.*

    New equipment has been purchased to modernize lab work. Computerized experiments have been introduced when appropriate. All physics labs need to be current and, as stated before, much work is continually needed to improve the labs and to make up more interesting labs that can be done with reasonably inexpensive equipment by students with little experience, in 3-hour period.

    The improvements in the classrooms and purchases of the new equipment for the physics department were in part possible thanks to the generous support from the Julius Sumner Miller Foundation and in part thanks to the passage of a bond measure.

17. *Changes in funding should be reported to faculty as soon as possible, not a few days ahead of the time budget requests are due.*

Our department has been informed in a timely manner by our dean when budget requests are due.

18. *Faculty members feel that an adjustment in budget priorities is needed. With cuts in funds, less money should be spent in non-instructional programs, like TQM and its successors, and more should be spent on equipment essential for carrying out teaching programs.*

    The department has not pursued this since the last review and do not know if this is still an issue.

19. *A Physics Department policy book needs to be started. It should contain policies previously tacitly agreed upon but not written down, and policies adopted by the department in the future.*

    A Physics Department policy book was started, but the effort was later abandoned since all instructors follow the agreed upon policies. The effort of writing a policy book may have merit and should be reconsidered since such a book may enable the members of the physics department to clearly and conveniently communicate these policies to new instructors. It is easier to write policy when everyone is in agreement than when there is conflict.

20. *Scheduling of classes for the department should be done, in first draft, by a faculty member rather than by the dean's office.*

    Our department is fortunate to have a dean who is far above average in competence, concern, and willingness to work harmoniously and cooperatively with the physics staff in making decisions about every aspect of the physics program, and in particular about scheduling.

21. *We need a policy that will allow the dean to place more reliance upon accumulated evidence of incompetence and dereliction of duty, rather than having to rely only upon widely-spaced class observations, in order to have sufficient reason to remove unsatisfactory tenured instructors from the classroom.*

    It is recognized that this is a negotiable issue and department faculty would need to work through the Federation to address this concern.

22. *New or part-time instructors whose background and experience are not adequate to prepare them to teach the engineering physics courses (1A-1D) should not be assigned to teach these courses because of their personal preferences or because it is thought that they should obtain practice in teaching them.*

    For the past few years, no part-time instructors have been assigned to teach courses for which they are not adequately prepared. Currently, the full-time faculty is consulted regarding the assignment of classes.

II. Program Statistics

A. Demand: FTES by Course/Program

Instructions: Analyze the **FTES by Course/Program** using 1st census data and answer the following questions. At a minimum, your analysis must include a 3-year cycle comparing like semesters.

Course	Year 1 (Fall semester 2003)	Year 2 (Fall semester 2004)	Year 3 (Fall semester 2005)
Physics 11	14.26 (four sections)	15.12 (four sections)	14.28 (four sections)
Physics 12	2.44 (one section)	2.55 (one section)	1.38 (one section)
Physics 1A	24.28 (four sections)	25.57 (four sections)	21.46 (four sections)
Physics 1B	7.15 (two sections)	3.59	5.20
Physics 1C	8.86 (two sections)	8.86 (two sections)	11.67 (two sections)
Physics 1D	2.87 (one section)	(offered spring)	(offered spring)
Physics 2A	26.4 (four sections)	23.22 (four sections)	28.54 (four sections)
Physics 3A	5.76 (one section)	9.27 (one section)	10.77 (one section)
Physics Total:	**92.02**	**88.18**	**93.30**

The following table includes the courses that are only offered during the spring semester.

Course	Year 1 (Spring semester 2003)	Year 2 (Spring semester 2004)	Year 3 (Spring semester 2005)
Physics 2B	1.91 (one section)	4.89	4.46
Physics 3B	6.51 (one section)	8.27	7.75
Physics 1D	8.21 (one section)	4.11	6.46
Physics Total:	16.63	18.08	18.67

1. **Given the data, can you recognize any trends in course demand in any of the Program's courses?**

   (a) Physics 12 experienced a decrease in enrollment in 2005, possibly due to scheduling or lack of promotion of the course. Enrollment in this course tends to vary greatly from semester to semester.

   (b) Physics 3A has experienced a steady increase in enrollment. FTES have increased from 5.76 in 2003 to 10.77 in 2005. The increase in enrollment may be due, in part, to an error of CSULB in its published requirements for transfer of science majors. Physics 3A was erroneously listed as being required for transfer instead of both Physics 1A and Physics 1B.

   (c) Due to the large spring enrollment of Physics 1D, one section was offered in fall 2003 to see if it was viable. Enrollment was not as strong as in the spring and renovation of the science complex prevented us from offering it again the following semester.

2. What are you doing to respond to trends?

(a) We need to promote Physics 12. We should regularly remind counselors that many students find this course enjoyable and instructive, and that this course fulfills students' requirement for a science lab.

(b) It may be necessary to add another section of Physics 3A during the fall semester. The department also worked with the faculty at California State University, Long Beach to correct the articulation agreement that indicated that Physics 3A was equivalent to Physics 1A.

(c) The difficulty with Physics 1D is that we do not have enough students to support strong enrollment in the class twice a year; during the fall and during the spring semester, yet too many students enroll in the spring semester, when it is offered. The department feels that classes of the size of Physics 1D (of close to 40 students) are undesirable for pedagogical reasons, since it is impossible for the instructor to interact with students in class or to check student work adequately, particularly during the lab period. Discussions are taking place to determine if we should offer two sections in the spring with one being offered in the evening to support our evening students.

3. Should a recommendation be written addressing the data?_X_ Yes _ No
(If yes, list.)

(a) Promote Physics 12.

(b) Determine the need to add another section of Physics 3A and 1D

B. Offerings: Fill Rate*

Instructions: Review and analyze the **fill rate data** (including the fill rate per course for both day and evening), provided by Institutional Research for this program for a three year cycle and answer the following questions:

Average fill rate of courses in program: How does this program compare to:

	Year 1 (Fall Semester 2003)	Year 2 (Fall Semester 2004)	Year 3 (Fall Semester 2005)
Day classes Physics 11	94%	104%	100%
Evening classes Physic 11	100%	94%	83%
Day classes Physics 12	77%	80%	43%
Day classes Physics 1A	93%	101%	77%
Evening classes Physic 1A	93%	90%	100%
Day classes Physics 1B	80%	67%	97%
Evening classes Physic 1B	53%		
Day classes Physics 1C	83%	60%	77%
Evening classes	53%	77%	103%

Physic 1C			
Day classes Physics 1D	53%		
Day classes Physics 2A	83%	70%	88%
Evening classes Physic 2A	106%	103%	120%
Day classes Physics 3A	66%	106%	123%
Physics Total	**83%**	**88%**	**91%**

1. Given the data, is the program in a growth mode?_X_ Yes ___ No
   Comment.

   The growth in the physics program is due primarily to increased enrollment in Physics 2A and in Physics 3A.

2. What adjustments are indicated?
   Explain.

   Adding an evening section for the Physics 3A course, and possibly another evening section for the Physics 2A course, may be all that the department requires for now. We should again explore the possibility of offering Physics 1D twice a year, once during the fall semester and once during the spring semester.

3. Should a recommendation be written that addresses the data? _X_Yes __No
   (If yes, list.)

Stated above

C. Scheduling: Student Satisfaction with Scheduling

Instructions: Complete the chart below. Indicate the time when sections of courses in the program are currently scheduled to start. Analyze the data provided by Institutional Research on student satisfaction with scheduling in the program and answer the questions.

Course	During the early morning before 10 am	During the late am/early pm 10am –1:55 pm	During the late afternoon 2 pm -4:25 pm	During the evening 4:30 & later	During the weekend	During the summer	Via Teleco urse	Via Online
Physics 11	1 (106%)	2 (109% and 86%)		1 (83%)		2 (90%and 65%)		
Physics12			1 (43%)			1 (70%)		
Physics1A	1 (37%)	2 (103% and 90%)		1 (100%)				
Physics 1B		1 (97%)						
Physics 1C		1 (77%)		1 (103%)				
Physics 2A	2 (86% and 83%)		1 (94%)	1 (120%)		1(84%)		
Physics 3A	1 (123%)							
Physics 2B						1 (123%)		

1. What (if anything) is indicated by the student satisfaction with scheduling?

   The survey of students indicates that most students are very satisfied with our early morning and late am/early pm scheduling of classes. Most of our students are somewhat satisfied with the late afternoon and evening scheduling of classes. Students would probably like to have more classes scheduled in the late afternoon. It is not clear why students are not very satisfied with schedule of the evening classes since these classes are generally well attended.
   It is possible that, given a choice, more students would attend a late am/early pm class than an early morning class before 10 am.
   The physics department seldom offers weekend classes, which explains why students are very unsatisfied with our weekend schedule of classes. Weekend classes have not been well attended in the past, so it's not clear that we should offer weekend classes.
   Most students are very satisfied with the scheduling of classes during the summer
   The physics department does not offer on-line courses.

2. Are there time periods of high student demand which are not being addressed? _x__ Yes __ No How could such demand be addressed?

   We could address the high demand for the physics 2A and physics 3A courses by offering an additional section of each in the evening.

3. Should a recommendation be written addressing this area? _X__ Yes ____ No
   (If yes, list.)
   Stated above.

D. Retention and Success

1. Retention

Instructions: Review and analyze the data on **retention (course completion with a grade other than W)** over a three-year cycle comparing day to evening classes, term to term (e.g. fall to spring, spring to summer, etc.), and course levels.

1. Given the data, what trends are observed?

Comment.

The retention rate has remained relatively consistent for the past three years. The retention rate for all physics classes was 87.1% in Spring 2003, 82.1% in Spring 2004, and 85.1% in Spring 2005.

The average retentions by course for Spring 2004, Fall 2004, and Spring 2005 were:
P-11 70%, P-12 84%, P-1A 61%, P-1B 81.1%, P-1C 75%, P-1D 93%, P-2A 69%, P-2B 95%, P-3A 87%, P-3B 83%. For comparison, the average retentions per course for Spring 1991, Fall 1991, and Spring 1992 were:
P-11 77%, P-12 84%, P-1A 57%, P-1B 90%, P-1C 70%, P-1D 93%, P-2A 70%, P-2B 93%.
The above data shows that retention rate has remained relatively consistent over the years.

Faculty is concerned that many students lose a semester by enrolling in and then dropping Physics 1A. One of the reasons for this drop is that sometimes students have weak or distant background in mathematics and in physics. Most Physics 1A instructors warn students with weak background that they are likely to drop the class, and recommend that they take preparatory courses such as Physics 11 and Physics 13 (not currently offered because of low enrollment) or Physics 2A, but many students persist in continuing with Physics 1A. Many instructors believe that Physics 11 and Physics 13, taken concurrently, offer stronger preparation for Physics 1A than Physics 2A. Most Physics instructors encourage students to attend MESA workshops, make use of instructors' office hours as well as of the tutoring services offered at the library. Lack of enough time or motivation to do the work is another reason for not succeeding in Physics 1A.

2. Should a recommendation be written addressing the data? _X____ Yes ____ No

(If yes, list.)

Offer and promote Physics 13.

2. Success Rate

Instructions: Review and analyze the data on **success rate (students who earned a grade of A,B,C, or Credit)** over a three-year cycle comparing day to evening classes, term to term (e.g. fall to spring, spring to summer, etc.), and course levels and answer the following questions:

1. What trends are observed?

The overall success rate has remained relatively consistent. The success rate for all physics classes was 73.1% in Spring 2003, 73.4% in Spring 2004, and 74.1% in Spring 2005.

The overall grade distribution for the department for Spring, 2005 was 16.1% A, 25.9% B, 21.3% C, 6.1% D, 4.8% F, 25.7% W. The grade distributions have remained relatively consistent for the past three years.

2. Should a recommendation be written addressing the data? _____ Yes ___X__ No
(If yes, list.)

III. Curriculum
A. Course and Content

1. Courses Not Offered

Instructions: Indicate the total number of courses in the program and list all courses in the program which are in the catalog but have not been offered in the last three years. Refer to this list to answer the following questions:

1. Given the data, are there courses that should be inactivated? _____ Yes ___X__ No
Comment.
Two courses have not been offered in the past 3 years. Physics 13, which covers elementary problem solving techniques designed to prepare students for Physics 1A, and Physics 99 abc. Physics 13 has had to be cancelled because of low enrollment. Physics 1A has as a prerequisite Physics 11 and Physics 13, or Physics 2A or one year of high school physics. Some members of the physics department believe that taking Physics 13 and Physics 11 may be more beneficial to students than taking Physics 2A. Most of our students opt for taking Physics 2A. The members of the physics department believe Physics 13 should remain in the catalog as a possible option in the future. Physics 99 should remain as an option to students.

2. If there are courses not offered in the last three years that you do not wish to inactivate, what reasons are there to keep them active?

See above.

3. Should a recommendation be written addressing the data? ____ Yes __X___ No

2. Course Revisions and Additions

Instructions: Utilize the Course Review Chart from the Curriculum Office to answer the following:

1. Are there course outlines that should be revised? _____ Yes ___X__No
(If yes, list.)

2. Are there courses inconsistent with current practice in the field? ___ Yes _X__ No
Explain.

3. Should new courses to be added to the program? _____ Yes __X___ No
Explain.

4. Are adjustments necessary to the conditions of enrollment (Prerequisite, Corequisite, Recommended Preparation, and Enrollment Limitations) for a specific course to increase student success?

____ Yes __X__ No ____ Uncertain **Comment.**

Initially it was believed that the prerequisite for Physics 3A should be changed to allow concurrent enrollment in Mathematics 160 or Mathematics 190. However during course and content review, it was determined that the prerequisite was correct.

5. If the program offers a degree and/or certificate, list them and indicate when the requirements were last reviewed? **(If not applicable, skip to Question 7.)**

The only degree offered is an A.S. degree in transfer Physics.

6. Are these degree and/or certificate requirements inconsistent with current practice? ___ Yes _X__ No

Explain.

This transfer degree is based on what transfer institutions consider important for physics majors. It reflects current thinking in the field.

7. Is there a need to create or delete a degree and/or certificate? ____ Yes _X___ No

Explain.

8. Should any recommendations be written that address the above responses?__ Yes X No

(If yes, list.)

B. Articulation

Instructions: Using the California Articulation Number (CAN) Guide, answer the following questions:

1. Should any of your courses not currently included in the CAN Guide be articulated?

   No.

2. What problems, if any, are there in articulating courses?

3. Should a recommendation be written addressing above responses? _____ Yes __X___ No
   (If yes, list.)

C. Instruction and Assessment

1. Learning Methods

1. What learning methods are incorporated inside and outside the classroom in the program to promote student success? **Explain.**

Lectures, demonstrations of experiments showing physical phenomena, laboratory work, homework.

Research has shown that increased interaction between instructors and students is beneficial to students. In conjunction with the Astronomy department, Physics has purchased a class response system and has begun to incorporate its use.

2. Should a recommendation be written addressing above response? __X___ Yes _____ No
   (If yes, list.)

Explore new technologies that enable the instructor to interact more and in a more meaningful way with students.

2. Assessment

1. How do you evaluate the extent to which the learning objectives, skills, and competencies are being met?

   A) Courses
   This is done primarily through examinations, lab reports, and homework assignments.

   B) Program
   There are no program competencies or skills.

2. How do you use the results of the above evaluation to improve student learning and the quality of the program?

   Assessment tools and instruction are continually adapted based on students' performances on the above activities.

3. Should a recommendation be written addressing this area? __X___ Yes _____ No
   (If yes, list.)

The department needs to develop appropriate student outcomes for courses and the program.

IV. Program Requirements
A. Instructional Support

1. Identify key instructional support areas used by the program.

Libraries & Programs:

X	Library		Special Resource Center		Basic Skills Study Center		Library Orientation
	Music Library		Puente Program	X	Honors Transfer Program		Other (Please list.)
	Learning Resource Center Media Materials Collection		Assessment/Testing Office	X	Counseling		
X	EOP&S/CalWORKS	X	Transfer Center		First Year Experience		
	Learning Communities		Project Success		Honors Transfer Program		

Computer Labs & Tutoring:

	LMTC Computer Commons		SRC High Technology Center		Other Computer Lab: Please list.		Writing Center
	CAI MAC Lab		Writing Lab				LRC Tutorial Program
	CAI Windows Lab		Math & Science Lab				Math Tutoring
	TOP Lab		Keyboarding Center				SRC Tutorial Program
	Hawthorne BTC						EOP&S Tutoring
	Inglewood Center						

Faculty Support Services:

	Graphic Arts	X	Copy Center		Distance Education		Other (Please list.)
	Media Services AV Production	X	Tech Services Help Desk		Teleconferences		
	Media Services AV Equipment Distribution	X	Support Staff		Webconferences		
	ECC Vehicles	X	ECC hosted Websites	X	Staff Development		
X	ECC E-mail						

2. Do you have some instructional support needs that are not being met? __X__ Yes ____ No

Comment.

We need additional tutors for the physics courses

3. Should a recommendation be written to address your needs? __X__ Yes ___ No

(If yes, list.)

Work with the Learning Resource Center to find qualified tutors.

B. Facilities and Equipment

1. Does the program make effective use of its facilities and equipment? **Explain.**

We have a wide assortment of lecture demonstration equipment in physics. It is well organized and easily accessible. Much of the equipment has been constructed over the years by our technicians and instructors. We have shop facilities to build and repair equipment.

Each classroom is equipped with gas, electricity and water all of which are used for various lab experiments. Each classroom has a computer at the front of the room with a projector.

2. Are adequate facilities, equipment and supplies available for the program? ____ Yes ___X_ No

Explain.

The shop needs water and gas to facilitate reparation as well as construction of equipment. The gas and water lines were severed during renovation and not reconnected. This has been an unacceptable hardship for the technicians.

3. Are the facilities and equipment adequately maintained? ____ Yes ____ No
Explain.

For the most part, the equipment is adequately maintained. Some of our older equipment, like some of our ballistic galvanometers, is in need of repair because of difficulties in obtaining or producing spare parts.

4. Should a recommendation be written addressing the data?_X__ Yes ___ No
(If yes, list.)

1. Install gas and water in the workshop.

2. Develop a plan to identify and replace older or antiquated equipment with more modern equipment.

C. Staffing

Instructions: Analyze the data on **FTEF, adjunct FTEF, and the FT/PT ratio** for the most recent fall semester and answer the following questions:

			FT/Total load
Fall 2005: # of full-time FTEF: 4.15	# of adjunct FTEF: 1.12	Total: 5.27	Ratio 80%
Fall 2004: # of full-time FTEF: 3.58	# of adjunct FTEF: 1.67	Total: 5.25	Ratio 68%
Fall 2003: # of full-time FTEF:	# of adjunct FTEF:	Total:	Ratio

1. How do the program numbers compare to a like semester (Fall to Fall) three years ago or the previous program review?

The FT/PT ratio is above the state's goal of 75%. Our FT/PT ratio has improved because we added a new full-time instructor to our department, Fall 2005. On the other hand, David Vakil from the Astronomy department taught a Physics 2A class Fall 2005 and currently teaches physics classes, making our FT/PT appear higher than actual.

2. What do the program data indicate? Comment on any trends or unusual data.

There have been no unusual trends in the data.

3. How does the FT/PT ratio benefit or harm the program?

The present FT/PT ratio is beneficial to the program. The presence of full-time faculty during the day and evening classes promotes more contact between faculty and students and also eases communication among faculty.

4. Do you have a faculty mentoring program? _____ Yes ___X___ No

Describe.

While the department does not have a formal mentoring program, faculty is able to meet informally to discuss procedures. Offices are centralized for the full-time faculty making it easy to share ideas.

5. How do faculty maintain currency in their field?

Most full-time faculty go to AAPT (Physics Teacher's Association) meetings. Often when faculty are near another college, they will visit the physics facilities to compare them with ours in order to get new ideas. Most faculty are diligent in reading monthly physics journals and in discussing among themselves interesting questions of physics mentioned there.

6. Fill in the faculty status data below and answer the questions that follow.

Name	Reassigned time (how much in %)	Currently on leave (check)	Retired in last 2 years (check)	FT hired last 3 years (check)	Anticipated to retire in next 3 years (check)
Eyal Goldmann	0%			X	
Norman Kadomoto	0%				
Leon Leonardo	0%				
Susana Prieto	0%				

6a. How does this data impact the program?

There is no impact on the program

6b. Will this data affect the program in the future?

The program may be affected if some of the current instructors decide to retire.

7. From this information, can you identify present and future staffing needs? ____ Yes __X__ No

Explain.

8. What is the department doing to address any future staffing needs?

It is likely that 1-3 of our full time instructors will retire in the next few years. The department will take action when appropriate.

9. Should a recommendation be written addressing the data? _____ Yes ___X__ No
(If yes, list.)

D. Planning

1. Do the program faculty and other personnel have a clear idea of what is happening in the program, where it is headed, what external changes are affecting it, and what changes need to be made in order to enable the program to adapt and continue to be successful? **Explain.**

Enrollment appears to be steady for the Physics 1A-D series, and appears to be growing for the Physics 2A-B and Physics 3A-B series. The faculty are continually involved in improving and modernizing the labs and lectures to ensure student success.

Industry and Technology has been given a grant to initiate an engineering technology program. Physics 2A will be part of this program. This will likely increase the demand of this section of physics.

2. What data, not currently provided, would be needed in order to improve planning for the development of the program? **Explain.**

As mentioned earlier, information on transfer students would enable us to tailor the program to improve student success.

3. What major external changes or trends do you expect to be of particular relevance to your discipline in the next five years?

Technology will continue its rapid development, affecting how our labs and lectures will need to be presented.

4. What will the implications of these changes or trends be for the program and how will the program need to respond?

More technology will have to be used in lectures as well as in labs.

5. Based upon the information above, how would you like the program to evolve within the next five years?

No evolution is necessary, as long as the faculty maintain their active approach to incorporating newly available technologies into their classes.

6. Should a recommendation be written addressing the data? _____ Yes ___x__ No
(If yes, list.)

V. Conclusion

1. Prioritized Recommendations

1. Promote Physics 12.
2. Determine the need to add another section of Physics 2A.
3. Determine the need to add another section of Physics 3A and Physics 1D.
4. Offer and promote Physics 13.
5. Explore new technologies that will enable the instructor to interact more and in a more meaningful way with students.
6. Work with the Learning Resource Center to find qualified tutors.
7. Develop a plan to identify and replace older or antiquated equipment with more modern equipment.
8. Install gas and water in the workshop.
9. Write a department policy book.
10. Improve communication with counselors working in areas other than science and mathematics.
11. The department needs to develop appropriate student outcomes for courses and the program.

2. Major Needs

1. Our area was recently remodeled, and the some classrooms need new charts for the walls, and new permanent demonstrations.
2. Install gas and water in the workshop
3. Hire one or two long-term tutors for the Learning Resource Center.
4. Continue to improve labs in all courses.
5. Maintain current high level of instruction in Physics.

3. Strategies

The department will establish committees to address the recommendations.