

Program Review 2008-2011

Division: **PSME**

Department or Program: **Physics**

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I. Description and Mission of the Program

Basic Skills Transfer Career/Technical Other (describe)

The justification for the checking of “Other” is because of the physics department’s belief that any knowledge gained about the logical behavior of the world we live in via a physics class is an invaluable intellectual survival tool of a college educated individual

A. The purpose or mission of the physics program, in addition obviously to teaching physics, is developing a student’s ability to think critically and independently for herself, logically analyzing and evaluating information and then from it, to gain insight and make meaningful, useful conclusions about the problems encountered throughout the course of her life.

The physics department teaches four distinct sets of classes.

1. Physics 10. A one quarter, 5 unit, non-laboratory, conceptual physics course (i.e., essentially non-mathematical) is offered specifically targeted to non-science majors as a GE course.
2. Physics 2A, 2B, and 2C. One year of physics with algebra and trigonometry (and just a tad of calculus) including a laboratory is offered primarily for health science and biology majors.
3. Physics 50. A stand alone preparatory class, essentially non-transferable, for the difficult physics 4 sequence.
4. Physics 4A, 4B, 4C, and 4D. Four quarters of “hard-core” physics with a lab is offered for the engineering, chemistry, math, and physics majors.

These classes are common to virtually all academic institutions in the United States (with perhaps the exception of physics 50). All of these classes can be used for an AA degree or they fulfill transfer requirements.

B. The De Anza physics department is proud of its reputation in preparing our students for success in transferring to any university. A successful De Anza physics student can be confident that her ability in physics will be outstanding when moving into the upper division classes encountered at a transfer institution. Our strength is the high-level standards set and maintained by our faculty. Another strength is our physics 10 class, a GE class in conceptual physics, which provides a service to the general non-science population in explaining the basic framework in fundamental scientific thinking so pervasive in modern culture its impact is hard to escape.

C. Areas for improvement are in reducing class size (to further improve success), hiring more full time faculty (third and fourth), and introducing new and more current lab equipment, including computerized data acquisition.

D. Expected outcomes are that students will successfully meet their requirements for transfer to four year institutions (for both science oriented and non-science oriented fields), be well prepared to successfully continue their education, and be able to describe and understand the physical world in logical terms.

II. Retention and Growth

A. Retention, success, and growth in the physics department have been exemplary. Our retention has moved from 77% in the 2005-2006 school year steadily upward to 83% in 2007-2008. Our success has constantly increased from 64% in 2005-2006 to 71% in 2007-2008, a rare feat for any department on campus. And our WSCH has increased from 9,668 in 2005-2006 to 9,944 in 2007-2008, an increase of nearly three percent.

In order for the physics department to further address the institutional goal of increased access, growth, and retention of under-represented minorities, these students should be identified to the faculty so that they could provide support, counseling, recommendations, and mentoring. Having identified these students, the faculty can then address the student's needs and help them succeed academically by making the proper implementations. The willingness of our faculty to provide such support will definitely help our department obtain student equity in the classes we teach. Although, the goal of student equity may seem "quite challenging" to faculty, it is imperative that as teachers we understand the importance of the success of under-represented minorities and that we continue to address such challenge diligently.

B. Our retention in physics for the Black and Hispanic community is higher than the PSME (58 to 53 percent success). For the Filipino community, our success is only slightly lower than our division's. One event that our department has accomplished to increase these numbers is, in effect, to have taken the Engineering Club under our wing. Our outstanding physics technician, Charles Norona, has allowed the club to meet in our physics labs and has provided overwhelming support and advice for their activities. A new advisor to the Engineering Club is now a physics faculty member. This club invites students of all ethnic and racial backgrounds to enjoy an inviting, nurturing, and relaxed social environment to explore their interests in scientific areas with their peers.

C. Physics stands in a unique position with respect to basic skills. There is no other discipline where verbal skills and logic intertwine with mathematics to accomplish its goals. The successful physics student will enjoy an unparalleled ability to unite mathematical thought and logic with precise verbal expression and achieve an ability to think critically, accurately, and with confidence. We have a new supervisor at the resource center and we intend to work with her to increase tutoring and other support resources for students in our program who require additional assistance in basic skills.

III. Student Equity

The issue of student equity for targeted groups has been addressed in part II b, above.

The tutoring center has greatly enhanced the opportunity for physics students to get help where none existed. We do feel that a continuation of the Engineering Club with Charles Norona as its tech/advisor will be conducive to increasing the participation and academic success of students in targeted background areas.

IV. Budget Limitations

The physics department is plagued by a chronic lack of adequate funding for full time faculty positions. In 2003, a fourth full time position was finally approved after many years of requests and informal acknowledgments by the administration that it was due. A hiring committee was formed and a job description written but due to the fiscal crisis of that era, the job was pulled and never replaced. Now the department faces, for the first time in its history, the struggle to continue its proven quality with only two full time faculty, not even three. It is imperative that this third full time position be replaced. Please note that we are not asking for a new position but only that the third position, vacated by the resignation last year of our third full timer, be replaced. If the third person had not resigned, this would be a moot point. Yes, we need four full time physics teachers to raise the quality of our department, but with only two full time positions, the current quality of physics instruction at De Anza will not even be maintained but will decline. The department is now below fifty percent full time faculty. Less than fifty percent of our current classes are being taught by full timers.

Also, funding for student field trips, presentations, guest speakers, and any other activities that will further capture and promote the interest of physics to our students is essential. Given our ideal geography of Silicon Valley, we should be able to provide our physics students with the opportunity to visit and learn about the wide spectrum of the uses and applications of physics in industry, technology, and research. Lack of department funding has prevented our students from these opportunities. It would take only a small increase in funding to accomplish this.