Physics Department for CCVC

1. *What are the strengths of your department/program? What do you already do well?  Remember that these responses will be shared with the community at large, so please use this opportunity to brag a little bit.  What do you want people outside your department/program to know about your successes and strengths?*

A primary strength is the experiential learning component within and throughout the entire Physics major. All senior majors are required to complete a research project. To support this endeavor, the sophomore and junior labs are designed with posters and presentations to provide students with a deepening understanding of research as well as learning what the various research areas of the department members are. One of the oldest research programs at these institutions, almost all of these projects are experimental and completed during the academic year.

We encourage many students to apply for REU’s and other summer research opportunities. Approximately 5 to 6 students participate in summer research per year and many go on to present their research throughout the year.

The course work is very comprehensive, particularly when compared to other small schools by visitors. Currently, we are able to offer upper division courses every year which allows students the flexibility to participate in other opportunities, in particular study abroad which approximately 1/3 of majors do.

We graduate about 10 majors per year with a little under 50% going directly on to graduate school and a few more attending later in life.

We also excel in cross disciplinary programs, particularly the Mapcores (Mathematics, Physics, and Computer Science Research Scholars) program with CSB and the integrative natural science course developed with Chemistry, Mathematics, Geology, Physics, and Biology.

The Physics curriculum provides sufficient flexibility to allow students (approximately 33%) to study abroad.

1. *What do you wish you could do better, or do more of?  What would it take (resources, support, etc.) for you to reach those goals?*

The integrative natural science course is difficult to staff. New resources are needed to improve this course, for example lab space and new equipment. If the preference was no longer given to ELED, there would be the potential for more resources, but then more people would be needed to run the course. However, there are always non-ELED students who want to take the course, so there is an expectation that demand for the course would be strong if the course were open to a wider range of students.

A smaller department means there is difficulty staffing more of the physics for non-majors courses, which have been popular in the past. It is also harder to continue emphasizing research for seniors with larger classes, sabbaticals, etc.

It would be particularly helpful to have more space, particularly lab space, for non-major courses. There are 40 hours of labs per week to schedule and 3 classes sharing 2 labs. With another lab space, it would be possible to run labs concurrently.

The ability to have a flexible budget would also be helpful. For example, the ability to save money from the budget for two years to be able to purchase large equipment. Furthermore, the department needs to keep modern with equipment and industry software packages to remain a comprehensive and competitive program.

Because of the industry software needs, there are some IT services challenges even with current computers, software, etc. Someone in IT that is familiar with physics labs and the technical challenges in such labs would be beneficial and save time for the faculty. Often older equipment won’t work on new computer systems, so more coordination for when and how things are replaced is needed. Software updates may need to not be automatic for lab rooms as updates often require completely new lab manuals to be developed for the students. This is a major concern for the department. We would like IT to do the footwork about what updates are compatible with our equipment or, alternatively, for updates to only be applied during summer.

When the number of NS courses was dropped, there was a noticeable drop in the enrollments in introductory courses, particularly in astronomy. While this was not disruptive to physics, there is some concern that perhaps we are not preparing students for scientific understanding and we want to do more with exposing students to scientific understanding.

1. *Leaving aside discipline specific knowledge, in what ways does your department/program best contribute to providing our students with a liberal education for their lives beyond college, as informed and engaged citizens, productive employees, ethical beings, etc.?*

In the wider community, we offer numerous NS courses and contribute to the FYS program in general and through Mapcores. Within the major, the research focus stresses oral and written presentations within the discipline. Additionally, the Physics curriculum emphasizes quantitative reasoning.

1. *Are there ways in which you would like to see your department/program contribute to liberal education that so far it has not been able to?*

We would like more focus on “liberal” science courses rather than just “scientific thought/quantitative reasoning” courses as many of the NS designated courses are really QR “flags”.

With fewer faculty, it has been harder to run the program, but it has also become harder to fill any positions with someone with wider interests (for example, ethics) than someone who is just a physicist. Also, if staffing allowed, there would be the possibility of running study abroad programs.

The number of students entering college having completed the NS Common Curriculum requirement through AP courses (and other courses while in high school) is concerning. The Physics Department would better contribute to the liberal education of students by having more students complete the NS designation while at CSB/SJU.