



Concept Paper
School of Engineering and Sciences
for Grades 7-12
Sacramento City Unified School District

INTRODUCTION

The School of Engineering and Sciences is a proposed public school in the Sacramento City Unified School District (SCUSD) for students in grades 7-12. The school is designed to increase the number of high school graduates who are adequately prepared for a career and/or advanced study in engineering or sciences in the Sacramento region. Graduates of this school will be eligible for university study in engineering or any of the sciences, be able to converse in a world-language in addition to English, and be ready for work in a science and/or engineering field.

Each student, under the guidance of an advisor and following an Individualized Learning Plan, will be expected to pass the California High School Exit Exam by the end of the 10th grade. Students will then embark on advanced studies in core subjects as well as internships and apprenticeships that will lead to a Certificate of Advanced Mastery (CAM). A CAM certifies that a student has acquired those skills applicable in the world of work and that a student is ready for university study. Additionally, many students will enjoy the opportunity to earn early college credit for their efforts.

NEED STATEMENT

The National Science Board (NSB) published the *Science and Engineering Indicators (2004)* and *The Science and Engineering Workforce/Realizing America's Potential*, two documents showing a troubling decline in the number of U.S. citizens trained to become scientists and engineers, and also a growing number of jobs requiring science and engineering training. Less than six percent of our high school seniors plan to pursue engineering degrees, down 36% from a decade ago.

It is expected that the number of jobs requiring science and engineering skills in the U.S. labor force is growing almost five percent each year. In comparison, the rest of the labor force is growing at just over one percent each year. The Bureau of Labor Statistics (BLS) projects a 47 percent increase in the number of science and engineering jobs by 2010. At the same time, the average age of the science and engineering workforce is rising. Many of those who entered the expanding science and engineering workforce in the 1960s and 1970s (during the Space Race) are expected to retire in the next 20 years, and their children are not choosing careers in science and engineering in the same numbers as their parents (*Indicators 2004*).

There is also a growing need of science and mathematics classes in schools. Students of today are taking more science and mathematics courses in high school than their counterparts did in the past. *Indicators 2004* writes, "1998, high school graduates earned an average of 3.5 mathematics credits and 3.2 science credits compared with 2.6 and 2.2 credits, respectively, in 1982."

If California is to maintain its technological preeminence and its remaining highly paid aerospace skilled and engineering jobs, it must address this issue. This issue must be addressed sooner than later as changes cannot bring measurable response in days or weeks. Years or decades will be required to foster students through the educational pipeline of 16 or more years towards advanced degrees in mathematics and science. Even if action is taken today to change these trends, a complete reversal is some 10 to 20 years away. The students entering the science and engineering workforce in 2005 with advanced degrees decided to take the necessary mathematics courses to enable this career path when they were in middle school, up to 14 years ago.

PARTNERSHIPS

This school will feature a partnership with California State University (CSU), Sacramento, which will provide facilities and staff with expertise to refine student skills in engineering and the sciences. Current existing partnerships include the Bill and Melinda Gates Foundation, Linking Education and Economic Development, Sacramento (LEEDS), Intel and MESA. These organizations will provide start-up funds for hiring the principal, training staff, and facilitating the development of additional partnerships for internships, apprenticeships and early college credit. Additionally, a partnership with the City of Sacramento is anticipated to form a joint-use library on the campus that will serve both the school and the community.

THE CASE FOR SMALL SCHOOLS

A growing body of research about small schools like the School of Engineering and Sciences indicates the average student achievement in small schools is higher; in many cases at least 15% higher. In fact, more students in small schools pass core classes and go to college, and these effects are greatest for low-income and minority students – a number of cases exceeding 90%. This type of program could add approximately 90 graduates per year in this region that could enter the California State University, Sacramento's College of Engineering and Computer Science and College of Natural Sciences and Mathematics that would not otherwise qualify. The SCUSD School of Engineering and Sciences will be a special school designed to serve as a statewide model for other communities wishing to create a pathway to these areas of study for a more diverse group of students.

CURRICULUM AND LOGISTICS

When the school is fully enrolled, it is expected to serve up to 500 students. Middle school students in grades 7 and 8, freshmen, sophomores and juniors will attend a state of the art school facility that features self-contained instructional wings that can serve a grade-level cohort's entire core curriculum instructional needs. Seniors, having demonstrated their readiness for advanced study, may attend school on the campus of CSU, Sacramento. The majority of the senior-year coursework will occur in classes taught by college instructors. Students will also spend part of their Junior and Senior years in internships and apprenticeships. Activities will be coordinated by the principal, the student's advisor, and a college liaison.

IMPLEMENTATION PLAN

The next steps for this project include the convening of a design team of educational experts and representatives from the business and public service communities and other community partners. The team will develop a detailed implementation plan that addresses curriculum and instructional methodology, community involvement, student and parent voice in governance, facilities needs, fiscal considerations, and staffing, administrative and governance structures.

Due to the generosity of the Bill and Melinda Gates Foundation, SCUSD is empowered to review this program proposal, and, if approved, the district can hire the principal a year in advance of the school's opening to manage the project's development. The key activities for the principal to facilitate over the course of one year prior to opening will include curriculum refinement, hiring and training teachers, and oversight of the completion of the facilities. Tentatively, enrollment at the school will ramp up two grades the first year and two grades the next year, and one at a time after that, over the next two years.

WHAT YOU CAN DO

Sacramento City Unified School District will be looking to state and federal agencies, local and national foundations and corporate/private sponsors for support in the form of financial, in-kind contributions, discounted or pro-bono products and services. Specifically, we are looking for sponsors to supply or fund laboratory and classroom equipment, provide additional startup operating funding and assistance with procuring a facility.

For More Information Contact:

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