Challenges Facing the University Physical Science Department In the New Century

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Many physical science departments in the western universities are facing serious challenges for their existence. Those survived may be labeled as "endangered species." The basic problem lies in the decline of student enrollment caused by the shrinking of the employment opportunities. This is especially acute for physics, chemistry and geology, which are often described as hard academic subjects that provide few practical skills necessary for students to eventually compete in the tight job market. The funding of these departments, which is largely based on enrollment, is subsequently affected. To make matter worse many physical science classes require laboratories that are very expensive to operate and maintain. In addition, more stringent safety precaution and standard lead to extra maintenance fees. As a result, one third of the physics departments in the British universities may be closed. Since 1997, 30% or 18 university physics departments have been closed. In the past nine years, 28 university chemistry departments have been also closed. In United States, the number of physics bachelor's degrees awarded has been declining. It peaked in around 1970 at about 6,000. At present, the number is about 4,000. A survey was done by the American Institute of Physics showed that for the 2002/2003 academic year 733 physics departments produced 4553 Bachelor's degrees in Physics or about 6.2 degrees per department. In the field of geological sciences hot topics are going through different cycles. In the early years petroleum geology was popular as employment opportunities offered by oil companies were plentiful. However, in the recent years the job market has shifted in favor of environmental geology and hydrogeology. Many departments have reacted and adjusted to the market demand. Adapting to a changing economic environment, university physical science departments vigorously search for new funding for equipment and recruiting of new teaching staff.

Universities across the nation are designing courses to prepare students for careers in industry. Some even created new graduate programs known as the Professional Masters to provide opportunities for students to improve their personal communications skills, work in teams, and be exposed to entrepreneurial environment. At present, more than 60 Professional Master's degree programs are at various stages of development in the US. The American Institute of Physics (AIP) recently released a report identifying 20 schools with the strongest Professional Master's degree programs in the country. California State University at Long Beach was recognized in the top three, along side the programs of Columbia University, the Georgia Institute of Technology, Texas Tech University, the University of Oregon, and the University of Washington. The report, which was produced by AIP and supported by the Alfred P. Sloan Foundation, pointed out that the survival programs must satisfy the needs of the economy as well as the needs of students by providing both fundamental knowledge and specialized

skills. It is now recognized that in the new century there have been an increasing demand for employees with scientific and technological skills for any work outside of an academic setting. Many students may gradually recognize that without such skills their job market is severely limited.