



Oregon Pre-engineering & Applied Science Initiative Summary of Strategy August 15, 2007

The Oregon Pre-engineering & Applied Science (OPAS) Initiative began in 2005 as a “spin-off” of the work of the Engineering and Technology Industry Council. See the following web sites for background information including membership rosters:

- www.oregonetic.org
- opas.ous.edu

The **OPAS Vision** is that all Oregonians have the opportunity to choose and successfully pursue engineering or applied science as their field of study and career, thereby helping Oregon’s industries contribute to state economic needs, and innovate and prosper in the global economy.

The **OPAS Mission** is to increase the number of work-ready engineers and applied scientists in Oregon through collaborations of education sectors, industry, and government stakeholders that ensure that all K-12 students have access to high quality education and career exploration opportunities that prepare them for postsecondary and workplace opportunities and success.

The **OPAS Strategy** can be summarized as

- **Motivate:** Enhance the ability of STEM¹ education programs to increase students’ interest and knowledge of engineering and applied science opportunities.
- **Prepare:** Increase the students’ exposure to engineering and applied science through active learning, student inquiry, engineering problem solving, and creative teamwork.
- **Succeed:** Increase the enrollment and successful completion of STEM programs by underrepresented populations.
- **Pathways:** Create, develop, and maintain engineering and applied science pathways so that more students successfully transition among education institutions and into the workforce.

A. Motivate: Enhance the ability of STEM education programs to increase students’ interest and knowledge of engineering and applied science opportunities.

The goal of the Motivate strategy is to increase students’ interest and knowledge of engineering and applied science opportunities for the purpose of pursuing technology-oriented careers. We have identified four phases of increasing interest and knowledge:

- (1) Awareness of STEM careers and opportunities;
- (2) Encounter STEM professionals and their work;

¹ Science, Technology, Engineering and Mathematics

- (3) Engage in STEM projects; and
- (4) Commit to pursuing a STEM career.

OPAS works with existing programs where possible to implement its strategies. The OPAS Motivate effort is currently focused on three areas:

- (1) Increasing the opportunities for students to encounter STEM professionals outside the classroom, e.g. science fairs, internships, robotic competitions;
- (2) Increasing the presence of STEM professionals in the classroom; and
- (3) Increasing the STEM content and impact of informal educational programs for students and their families.

B. Prepare: Increase the students' exposure to engineering and applied science through active learning, student inquiry, engineering problem solving, and creative teamwork.

OPAS seeks to increase the number of students who choose and persist to success in engineering and applied science by identifying and supporting programs that have demonstrated success and are capable of being offered much more broadly by schools statewide. Solid academic preparation in science and math is essential. In addition, pre-engineering education can play an important role in the preparation of many students. To serve the goals of OPAS, Oregon needs a collection of such programs that address both traditional engineering disciplines and applied science disciplines like computer science.

C. Succeed: Increase the enrollment and successful completion of STEM programs by underrepresented populations.

The OPAS Succeed effort is focused in three areas:

- (1) Developing materials to assist both professionals and volunteers in offering both formal and informal STEM education to students who are under represented in STEM fields;
- (2) Communicating best practices for serving these student populations to a variety of potential partners; and
- (3) Identifying existing organizations with which OPAS might link its efforts.

OPAS seeks to identify, understand, and address the numerous factors that have limited the limited the participation in STEM of minorities, young women, and other educationally underserved youth.

D. Pathways: Create, develop, and maintain engineering and applied science pathways so that more students successfully transition among education institutions and into the workforce.

OPAS seeks to create, develop, and maintain engineering and applied science pathways so that more students successfully transition among education institutions and into the workforce. A pathway includes mechanisms for credit articulation and transfer, as well as information about how income and job opportunities develop as students improve their education. Well documented pathways help students make informed choices about their education so they are able to enter careers in engineering or applied sciences. To date, OPAS has focused its Pathways effort on manufacturing engineering both for the results it can achieve and as preparation for work in other areas. It is currently considering adding electrical engineering or computer science to its work.