

Experiential Learning Programs for Industrial Engineering/ Operations Research Students

In addition to academic and technical preparedness, on-the-job training and other work-based learning experiences are critical components of worker readiness programs. These national programs provide co-curricular value to student career preparedness:

Engineers Without Borders USA

Engineers Without Borders provides service-learning opportunities for students at the local and international levels. The national organization offers internships while student chapters offer opportunities for developing leadership, working on infrastructure projects, and making connections with professionals who provide mentorship. Many projects are public works projects. Opportunities exist for students, recent graduates, and professionals.

Municipal Engineering Departments

Counties and cities offer opportunities for paid internships, co-ops, and externships. In externship situations, students spend one to three weeks with their hosts at their workplaces for a career exploration experience that usually includes networking, job shadowing, and a focus project. These experiences occur during semester breaks. It is important to emphasize that students can design their own externship experience.

National Society of Black Engineers (NSBE)

NSBE offers resources to students across the entire educational spectrum including retention, scholarships, leadership, and soft skills training through local networks and regional conferences. NSBE provides community STEM training for individuals who may want to mentor younger students.

National Society of Professional Engineers (NSPE)

Students can be members of NSPE and attend student chapters or local chapters to learn more about licensing and to network with professionals. The website offers a job board that can be filtered by internship opportunities. Students can log in to experience the virtual Professional Engineers Day event to learn more about the Professional Engineering (PE) license and to hear about the work PEs do from practitioners in the field.

Society of Hispanic Professional Engineers (SHPE)

The Society of Hispanic Professional Engineers program offers support and development to increase degree persistence and attainment as well as aid undergraduates in professional development for a transition into either a STEM career or pursuit of a graduate degree.

Society of Women Engineers (SWE)

Open to all genders, SWE chapters exist in many institutions of higher education. Chapter activities range from mentoring, K-12 outreach, career and industry presentations, and opportunities for technical competitions, scholarships and national conference attendance.

The Institute for Operations Research and the Management Sciences (INFORMS)

The Institute for Operations Research and the Management Sciences brings together a wide range of information and resources for students considering or pursuing degrees in analytics and data science. Through this organization both students

and professionals can take advantage of resources such as the analytics program database, video library, scholarships, conferences, publications related to the data science profession and much more.

US DOT Federal Highway Administration (FHWA)

FHWA offers internships and financial support through its Dwight David Eisenhower Transportation Fellowship Program to students pursuing transportation-related occupations. Two hundred students are placed annually in interest-related assignments throughout the agency.

Institute of Industrial & Systems Engineers (IISE)

The IISE is the world's largest professional society dedicated to the support of the industrial and systems engineering profession, and offers education, training, and research related to the field. Students joining IISE make valuable networking connections, are eligible for discounted training courses, can engage in IISE's online community, can learn about industry advances through the monthly IISE publication, and can join the IISE's Young Professional's group to connect with mentors and learn about job and internship opportunities.

Summer Transportation Internship Program for Diverse Groups (STIPDG)

The U.S. Department of Transportation (U.S. DOT), Federal Highway Administration's (FHWA) Office of Innovative Program Delivery offers internships to college students of various backgrounds. The objective of the STIPDG is to provide college/university students with hands-on experience and on-the-job training while working on current transportation-related topics and issues. The STIPDG is open to all qualified applicants but is designed to provide qualified women, persons with disabilities, and members of diverse groups with summer opportunities in transportation where these groups have been under-represented.

Institute of Transportation Engineers (ITE)

The ITE Student Leadership Summit is entirely planned by students, for students. Through the promotion of leadership and professional development, these events aim to guide future transportation professionals. The Traffic Bowl, another competition, tests students in topics such as transportation planning and engineering. State and local chapters provide opportunities for students to meet professionals and to learn about the latest in engineering practices in their communities.

The Association for Unmanned Vehicle Systems International (AUVSI)

Students involved in an AUVSI Student Chapter, gain experience in the industry and receive guidance from professionals in the chapter. Drones are emerging as a safer method for bridge inspection.

Innovative Learning Strategies for an Industrial Engineers/ Operations Research Analysts Program of Study

To establish curricular lessons and activities that incorporate the latest strategies for increasing student learning effectiveness and retention, a review of practices deployed by workforce and CTE practitioners reveals several approaches that would benefit students within related programs of study. These learning strategies include:

Competency-Based Curriculum

Curriculum that meets academic and quality standards, is designed and organized by competencies required for jobs, and is cross-walked with industry skill standards and certifications, where applicable. Job profiling and the use of subject matter experts (SMEs) should be considered to meet the competency needs of business.

Modularized Curriculum

Structured and sequenced curriculum in modules tied to jobs with multiple entry and exit points and multiple levels of industry-recognized credentials built into the pathway.

Asynchronous Learning

Education and training for students and incumbent workers provided at times and locations convenient to students and employers. This may include evenings or weekends, blended or "hybrid" delivery models, and delivery at off-campus locations.

Problem-Based Learning

Instruction that helps students who benefit from hands-on learning foster team-building skills while solving real-life problems.

Experiential Learning

Opportunities for "learning-by-doing." Examples include apprenticeships, internships, externships, rotational programs, co-op work experiences, simulations, and class projects that are assignments from local employers.

Context-Based Learning

Instruction that fosters interpretation of new information in the context or place of where and when it occurs. By relating new information to what the student already knows, the student comes to understand its relevance and meaning.

Individual Learning

Learners are different and innovative learning environments reflect the various experiences and prior knowledge that each student brings to class. It's important that practices and processes help teachers engage each student where they are.

Online "Micro-Learning"

This approach provides short, content-rich exploration of career opportunities and training modules that lead to a new form of stackable credentialing through badges and other forms of recognition, typically subject to the agency hosting the content.