Enterprise Systems Center (ESC)

The Enterprise Systems Center (ESC) was established in 1995. This multidisciplinary center is committed to providing students experiential learning and leadership development through industry value creation. ESC maintains a wide network of regional industry partner relationships to serve as a platform for course projects, summer and co-op projects and leadership immersion activities. Partnership and teaming on projects and programs is important and occurs frequently with the Department of Industrial and Systems Engineering as well as other departments and centers. The center seeks to advance interdisciplinary research and scholarship relating to analytics, information technology, new process development, sustainable manufacturing and enabling businesses to maintain global competitiveness. Additional research initiatives focus on discovering new methods for collaboration among academic, industry and government partners through the use of advanced technology. Emphasis is given to innovative systems approaches to problem-solving. Operating as one of the centers in the P.C. Rossin College of Engineering and Applied Science, the ESC is housed in Mohler Laboratory. The Enterprise Systems Center provides undergraduate and graduate students from all four colleges with the opportunity to work on teams with faculty and industry professionals to solve a variety of real world problems. Participation in these work teams, with ESC’s unique layered mentoring, provides students with a level of work experience representative of what they will encounter following graduation. This is often a critical factor in winning highly competitive employment positions. Since its inception, ESC has completed more than 1100 projects with industry and government partners. Over 3000 undergraduate and graduate students have benefited from experiential learning and leadership development through involvement with the Enterprise systems Center.

RESEARCH ACTIVITIES

The ESC conducts research into the development and implementation of enterprise strategies to improve the effectiveness of organizations. This research involves the utilization of systems thinking, information technology, and leadership approaches that add value to engineering education. In its applied research efforts, the Center focuses on analytics techniques, operational improvements, enterprise resource optimization, sustainable manufacturing and product development or enhancement. Operational improvement research with partner companies has included the development of decision support systems, processes for workflow analysis and facility reorganization, analysis of constraints and throughput improvement, evaluating sustainable manufacturing opportunities, agile business practices, utilization of analytics tools and creating new solutions for supply chain management. Work in enterprise resource optimization has included methodologies for business process reengineering and for the analysis and selection of Enterprise Resource Planning (ERP) systems. Applied research in product development and enhancement has included the use of computer modeling and simulation along with analysis and evaluation of existing products, and design for manufacturability and assembly support.

Involvement in these applied research activities with industry partners provides Lehigh students with hands on learning experiences built on progressive responsibility and contribution to high impact company projects. From these activities, students gain leadership skills and valuable industry experience.

The creation of technology-enabled educational resources augments traditional learning models. Coupled with knowledge management technology, these resources create integrated learning experiences and materials to support engineering courses. The ultimate objective is to identify key components of innovative behavior and develop the educational methods necessary to transfer to students the skills and experiences that will prepare them for leadership roles in society.

The Enterprise Systems Center houses laboratories and initiatives that enhance the overall center mission stated as follows: “The ESC is committed to helping students learn, while simultaneously providing value for our clients. We believe that our research should be driven by industry needs and enabled by close partnerships and collaboration.”

The newly established ESC Advanced Analytics Laboratory provides increased workspace and resources for industry projects and research programs. The laboratory supports a program structure designed to increase awareness, understanding and implementation skill development of a broad spectrum of analytics tools and techniques. Within the ESC is the Learning Collaboratory, an innovative educational environment designed to promote inquiry-based and competency-driven experiential learning. It enriches the classroom lectures with practical experience through industry partner interactions. The Collaboratory supports team learning, action learning, and the application of technology to augment traditional educational resources.

EDUCATIONAL OPPORTUNITIES

The ESC provides support for courses in the analysis and design of manufacturing systems, decision support systems (DSS), computer graphics (CAD), computer integrated manufacturing (CIM), industrial engineering techniques, analytics, experimental projects in industrial engineering, and leadership development. These courses are offered through the Industrial and Systems Engineering department. The ISE senior project class utilizes ESC facilities and a video teleconferencing system to step beyond the traditional classroom experience in the preparation and presentation of its culminating presentation.

The ESC is continuously developing new programs as part of its Leadership Initiative. ESC has founded and is home to the engineering leadership minor, the leadership development course (IE382) was recently named as one of the top curriculum innovations by the Institute of Industrial Engineers. The Lehigh Chapter of the National Society of Leadership and Success and the Innovation and Leadership Residency Club are also managed as part of the Enterprise Systems Center operation.

Participation in industry partner projects is open to all Lehigh students, both undergraduate and graduate, regardless of academic major, based on an interview process.

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