The Enterprise Systems Center (ESC) was formally established in 1995. This multidisciplinary center is committed to providing student experiential learning and leadership development primarily through industry value creation. The ESC maintains a network of industry partner relationships to serve as a platform for Industrial and Systems Engineering (ISE) Department course projects, summer and co-op projects and leadership activities. Partnership and learning on projects and programs is important and occurs primarily with the ISE Department as well as other departments and centers in the P.C. Rossin College of Engineering and Applied Science.

The Center seeks to advance interdisciplinary research and scholarship relating to analytics, information technology, new process development, systems optimization, 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. The ESC is conveniently housed in Mohler Laboratory which is also the location of the Department of Industrial and Systems Engineering.

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 4000 undergraduate and graduate students have benefited from experiential learning and leadership development through involvement with the Enterprise Systems Center.

RESEARCH ACTIVITIES
A central mission of the Enterprise Systems Center is to work in partnership with the Department of Industrial and Systems Engineering in both research and scholarship relating to manufacturing, information technology, operations research, and related fields. 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 re-engineering 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 help to create integrated learning experiences and digital content to support engineering courses. The ultimate objective is to identify key components of innovative behavior and develop the in-person and online educational methods necessary to transfer to students the skill-sets 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.”

Within the ESC is the Learning Collaboratory, an innovative educational environment designed for use in support of both physical and virtual classroom models. For example, it enriches traditional educational techniques by utilizing online lectures, presentations and industry partner interactions originating from their physical facilities. The Collaboratory supports remote learning, development of an entrepreneurial mindset and the application of new technologies to augment traditional in-person educational experiences. When utilized as a combined in-person and remote configuration, the ESC Collaboratory helps to create a highly flexible learning platform.

EDUCATIONAL OPPORTUNITIES
The ESC provides support for Industrial and Systems Engineering 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. All of these courses are offered through the ISE Department. The ISE senior capstone project class utilizes ESC facilities and a web conferencing system to step beyond the traditional classroom experience in project interactions, presentations and remote learning.

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 (ISE 382) was named as one of the top curriculum innovations by the Institute of Industrial and Systems Engineers. The Lehigh Chapter of the National Society of Leadership and Success is 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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