= Harold and Inge Marcus Department of Industrial and Manufacturing Engineering =

Established in 1908 , the Harold and Inge Marcus Department of Industrial and Manufacturing Engineering at the Pennsylvania State University in State College , Pennsylvania , is the oldest industrial engineering department in the world . According to the most recent U.S. News & World Report university rankings , the undergraduate program is ranked eighth in the United States and the graduate program 12th . The department is headed by Janis P. Terpenny , the Peter and Angela Dal Pezzo Chair , and is housed in the Leonhard Building in the West Campus area of University Park . Named for alumnus Harold Marcus and his wife Inge , the department employs 31 faculty members who serve approximately 200 graduate and 400 undergraduate students .

= = History = =

At the turn of the 20th century , Penn State had developed a national reputation for its engineering curriculum , but industrial engineering was only beginning to emerge as an academic discipline . Noted efficiency expert Frederick Taylor recommended that university president James A. Beaver hire Hugo Diemer , a professor from the University of Kansas , in the hope that Diemer would create an industrial engineering curriculum at Penn State . A two @-@ year option was ready by 1908 , and a four @-@ year bachelor 's degree program emerged the following year , the first of its kind in the world . At the time , courses consisted of modern industrial engineering fundamentals such as time and motion study , plant layout optimization , and engineering economics , in addition to courses on advertising and sales . The new department also took over the instruction of manual shop skills , including carpentry and metalworking .

At the time , the department did not have its own building , and for many years shared building space with other departments in the university 's College of Engineering . In the 1980s , members of the Penn State Board of Trustees began to consider expanding the campus toward the west , and by 1987 , initial plans to construct a new engineering building were in place . The board funded the project in 1995 amid concerns of damaging the aesthetics of the previously undeveloped western edge of campus . Some trustees disapproved of the building design , but the board ultimately released $ 5 million from its fund dedicated to expanding west campus . In 1998 , the project received additional funding from the Commonwealth of Pennsylvania . The building opened in 2000 and was named after William E. Leonhard , a 1936 Penn State College of Engineering alumnus who , with his wife , has donated in excess of $ 1 million toward engineering at Penn State . In 1999 , the department itself was named after alumnus Harold Marcus and his wife Inge , who donated $ 5 million to the department .

In 2005 , the department restructured the undergraduate industrial engineering curriculum for the first time in 21 years . Shifting its focus somewhat from its traditional manufacturing emphasis , the new curriculum introduced several courses related to the service industry . Four key research areas emerged : Human Factors ; Manufacturing ; Operations Research ; and Production , Supply Chain , and Service Engineering .

= = Academics = =

The department is recognized as one of the country 's premier industrial engineering departments . The 2014 U.S. News & World Report undergraduate program rankings placed the department eighth in the country , and the graduate program was ranked as tenth . Twenty @-@ nine full @-@ time faculty currently serve nearly 200 graduate and 400 undergraduate students .

At the undergraduate level , students can pursue a Bachelor of Science (B.S.) degree in industrial engineering . The first two years of the program consist primarily of general engineering courses , including math and science . Once these introductory courses are complete , students begin taking industrial engineering courses on topics such as engineering economy , manufacturing technology , statistics , work design , and operations research . Undergraduates are also permitted to pursue an approved minor and count three of the credits earned toward their industrial engineering degree .

Graduate students have a greater variety of options . The Master of Science (M.S.) degree is available through both a traditional thesis track , or a one @-@ year non @-@ thesis track . Options in manufacturing engineering , human factors / ergonomics engineering , and quality engineering are available for M.S. candidates . Furthermore , dual M.S. degrees in industrial engineering and operations research are offered .

At the Ph.D. level , students may pursue an industrial engineering degree , a dual @-@ degree in industrial engineering and operations research , or a degree in industrial engineering with a minor in operations research . Emphasis areas available to students pursuing the doctoral degree are Human Factors / Ergonomics , Manufacturing , Operations Research , and Production , Logistics , and Service Systems .

In addition to the study abroad opportunities available to all engineering students at Penn State , the industrial engineering department offers study abroad programs specifically for industrial engineering students .

= = Facilities = =

The offices of the department are located in the Leonhard Building . The structure encloses 95 @,@ 200 square feet (8840 m ²) on three stories , and its exterior is made of brick , cast stone , and glass . While the building contains some offices for mechanical engineering faculty and hosts a variety of engineering and non @-@ engineering classes , it primarily serves industrial engineering students and faculty . The building contains two lecture halls and multiple classrooms , a 24 @-@ hour computer lab , and undergraduate and graduate student lounges .

The building also contains numerous research and instructional laboratories , including : Additive Manufacturing and Reverse Engineering Lab ; Benjamin W. Niebel Work Design Lab ; Bridging Research in Innovation , Technology , and Engineering Lab ; Complex Systems Monitoring , Modeling and Controls Lab ; Design Analysis Technology Advancement Lab ; Distributed Intelligent Systems and Controls : Research , Education , and Technology Lab ; Engineering Statistics and Machine Learning Lab ; Human Performance Assessment and Modeling Lab ; Human Analytics Lab ; Human Subjects Testing Lab ; Laboratory for Quality Engineering and Systems Transitions ; Optimization Modeling and Application Lab ; Process Mechanics / Workholding Research Lab ; Service Engineering and Applied Optimization Lab ; and Smart Design and Manufacturing Systems Lab .

The department also houses and supports a number of research centers and initiatives including the Center for e @-@ Design , Center for Innovative Materials through Direct Digital Deposition , Center for Integrated Healthcare Delivery Systems , Center for Service Enterprise Engineering , Enterprise Integration Consortium , and the Initiative for Sustainable Electric Power Systems .

Additionally , the building contains a 10 @,@ 000 square foot (900 m ²) high @-@ bay manufacturing lab called the Factory for Advanced Manufacturing Education (FAME lab) . With the goal of reinforcing material taught in the classroom and introducing students to common engineering processes , the department brought together a variety of manufacturing equipment . It partnered with Haas Automation to create the Haas Technical Center , a section of the lab that contains 10 Haas CNC machining centers and turning centers . In the lab 's metalcasting area , students learn about casting and molding methods like green sand casting , resin bonded sand casting , and lost @-@ foam casting . A welding area is made up of six welding booths and contains equipment used for shielded metal arc welding , gas metal arc welding , gas tungsten arc welding , submerged arc welding , spot welding and plasma arc cutting . The facility also contains injection molding equipment , a manual machining area , and various types of testing and measuring tools .

= = Alumni and faculty = =

The department claims numerous industry leaders among its graduates . Susan M. Sinclair (1993) and Allen L. Soyster (1965) are among those who have held the position of president of the Institute of Industrial Engineers (IIE) . Soyster went on to become the head of the department from

1981 @-@ 1996 .

Harold W. Gehman , Jr . (1965) served as commander @-@ in @-@ chief of the U.S. Joint Forces Command and NATO Supreme Allied Commander , Atlantic until he retired in 2000 . In 2003 he was appointed to head the investigation of the Space Shuttle Columbia disaster .

Gregory Lucier (1986) , the president and CEO of Invitrogen , is also a well known and highly regarded alumnus .

The department 's faculty includes some of the leading thinkers in the field of industrial , manufacturing , and service systems engineering . Former faculty include Amos E. Neyhart , a traffic safety education pioneer and creator of the first driver education classes in the United States in 1933 . Inyong Ham , a Penn State professor (1958 ? 95) and an IIE Fellow , was known for his development of group technology and research on the use of computers in manufacturing and process planning . Another former faculty member , Benjamin W. Niebel , authored an introductory industrial engineering textbook , served as department head , and in 1976 won the IIE Frank and Lillian Gilbreth Award .