

**ILLINOIS STATE
UNIVERSITY**

**BOARD OF
TRUSTEES**

Resolution No. 2023.05/19
Approval of B.S. in Mechanical
Engineering

Resolution

Whereas, the Board of Trustees, as authorized by the Board of Trustees Governing Document, Section A, Government Statutes, Subsection 5, Reservation of Powers, has reserved to itself the final decision-making authority for the establishment of any new unit of instruction requiring approval by the Illinois Board of Higher Education.

Therefore, be it resolved that the Board of Trustees approves the proposal for degree granting authority for the B.S. in Mechanical Engineering.

Board Action on: _____
Motion by: _____
Second by: _____
Vote: Yeas: _____ Nays: _____

Postpone: _____
Amend: _____
Disapprove: _____
Approve: _____

ATTEST: _____ Board Action, May 12, 2023

Secretary / Chairperson

**Board of Trustees
Illinois State University
Approval of B.S. in Mechanical Engineering**

Mechanical Engineering is one of the broadest engineering disciplines and is central to many new technological developments. The proposed B.S. in Mechanical Engineering will prepare graduates to enter a professional engineering discipline focused on work using the principles of motion, energy, and force—ensuring that designs function safely, efficiently, and reliably, all at a competitive cost. Engagement in engineering design, practices and problem-solving begins early in the degree program, concurrent with foundational mathematics and science courses to build theoretical knowledge necessary for developing the advanced knowledge and creative mindset associated with professional practice. Once mathematics, natural sciences, and engineering design fundamentals sequences are completed, students complete their degree with a set of topic courses across the mechanical engineering discipline as well as specialized focused concentration courses. Students in this program study the forces and interactions between objects, both solid and fluid. They learn the principles of energy transfer, and how to apply these principles to solve practical engineering problems and design engineering solutions to fit a wide variety of situations. Distinguishing characteristics of the ISU BSME program are 1) the program features a multidisciplinary approach that involves an individual or team integrating and synthesizing knowledge from across a variety of disciplines to bridge the gap between academia and industry 2) a focus on equitable and inclusive practices that train ethical engineers to design with empathy and keep justice in mind, and 3) an integration of information literacy throughout the curriculum, resulting in engineers that think and evaluate information critically within and beyond their mechanical engineering discipline.

The program will be administered by the Department of Mechanical Engineering in the College of Engineering. This will be the first degree program offered by the department, and one of the first three offered by the College.

Demand for engineering professions is high in Illinois and the six surrounding states. Demand for mechanical engineers is projected to grow by 8.7% in Illinois and 2.2% nationally by 2030-31, compared to the previous decade (Illinois Department of Employment Security. Long-Term Occupational Projections [2020-2030], Bureau of Labor Statistics, U.S. Department of Labor [2021-2031]). Current and projected need for mechanical engineers in the state is significant. The proposed degree will not only provide an innovative and rigorous engineering program of study but also the integration of both electrical and mechanical engineering principles and a strong background in design. The proposed College degree programs will increase both the number of Illinois residents attaining a degree and the number of high-quality post-secondary credentials available to meet demand, especially since some qualified high school graduates choose to leave Illinois if they are not accepted into the engineering program of their choice. Providing these additional opportunities may help curb ongoing emigration and meet the growing needs of local industries and engineering firms. Finally, the intentional focus on equity, diversity, and inclusion will allow Illinois State University to effectively serve students who are traditionally underrepresented and underserved in engineering programs. This focus is enacted by connecting to authentic contexts that are relevant to students, teaching teamwork skills and utilizing team-based learning, and emphasizing engineering ethics and designing with empathy and integrity.

The program proposal has been developed by an ad hoc committee of Illinois State University faculty with experience and expertise related to the field of Engineering. The program was developed in response to a high need in the state and many requests for such a program from prospective students. The program is expected to enroll up to 60 students each year. Faculty teaching in the program will deliver the new program at its inception, with additional instructional capacity provided by the Office of the Provost as necessitated by enrollment growth. The Department has obtained letters of support from all collaborating academic units.

Faculty has developed 23 new courses (EGR and ELE courses) for the program. ABET-accredited engineering programs require a minimum 45 hours of engineering credits and 30 hours of mathematics and natural science credits. These necessitate more than 66 hours required for the major. These considerations, along with ISU's general education requirements, have pushed the degree program to 122 credits, which has been deemed allowable by the AVP for Undergraduate Education.

The proposal was approved by the Academic Senate on April 26, 2023.