School of Engineering

Dean: Andrea L. Welker; *Assistant Dean:* Martha H. Stella

The School of Engineering is composed of five departments: biomedical engineering, civil engineering, electrical and computer engineering, mechanical engineering, and Integrative STEM education. The School offers an interdisciplinary program in engineering science. Graduates of the engineering programs are prepared for employment at the professional level or to pursue graduate studies. The Integrative STEM Education department programs prepare students to be K-12 teachers of technology education and PK-8 teachers with a focus on integrative STEM.

Engineering Degree Programs

The School of Engineering offers the following engineering academic programs leading to a bachelor's degree:

- Bachelor of Science in Biomedical Engineering
- Bachelor of Science in Civil Engineering
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Electrical Engineering
- Bachelor of Science in Engineering Science (Specializations in Engineering Management and Robotics)
- Bachelor of Science in Mechanical Engineering
- Seven Year Medical/Bachelor of Science in Biomedical Engineering, offered in conjunction with Rutgers New Jersey Medical School (NJMS)

The School of Engineering offers the following engineering minors:

- Computer Engineering
- Electrical Engineering
- Engineering Science
- Mechanical Engineering

Accreditation

- The Bachelor of Science in Biomedical Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Bioengineering and Biomedical and Similarly Named Engineering Programs.
- The Bachelor of Science in Civil Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Civil and Similarly Named Engineering Programs.
- The Bachelor of Science in Computer Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications,

Telecommunication(s), and Similarly Named Engineering Programs.

- The Bachelor of Science in Electrical Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs.
- The Bachelor of Science in Engineering Science is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Engineering, General Engineering, Engineering Physics, and Engineering Science.
- The Bachelor of Science in Mechanical Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Mechanical and Similarly Named Engineering Programs.

The engineering programs prepare students for careers in research and development, design, and engineering practice. The engineering programs equip graduates for entry-level positions as engineers in industry and place them on track for professional registration. The course of study in engineering will provide the opportunity to pursue an engineering specialty in one of the following engineering disciplines: biomedical, civil, computer, electrical, or mechanical engineering, or engineering management. The programs also prepare students for admission to graduate school to continue their education toward the MS or PhD degrees in a recognized engineering or other technical specialty, and other related advanced degrees.

The engineering curricula provide each student with a thorough understanding of why and how things work. They develop the ability to predict the effect on a proposed or existing design of different choices in the use of materials, form, and procedures. The curricula are built on a core of general studies taken from many disciplines and taught by experts in those specific fields of study. They are also firmly based on a study of fundamental concepts in mathematics and physical sciences and taught at a high level of intellectual challenge. The curricula provide exposure to the theory of engineering and design that underlies all engineering specialties, while offering the student the opportunity to explore a particular engineering specialty in depth.

The TCNJ engineering programs provide students with considerable exposure to laboratory experiences and are supported by excellent laboratory resources. Laboratory activities help develop skills in original design and develop a student's confidence in his or her ability to critique and improve a design. The engineering programs at TCNJ are limited to undergraduate studies. Laboratories, therefore, are designed specifically for teaching, are relevant to the course material, and are kept accessible for students.

Teacher Preparation Programs

The School of Engineering offers the Technology, Engineering, and Computing Education program leading to a Bachelor of Science, which prepares students to be K-12 teachers of Technology. In collaboration with the School of Education, the School of Engineering offers Bachelor of Science programs in Inclusive Education – Early Childhood and Inclusive Education – Elementary, as well as BS/MAT programs in Inclusive Education + Special Education, and Inclusive Education + Elementary Education of the Deaf and Hard of Hearing, all with a focus on Integrative STEM Education.

The Technology, Engineering, and Computing Education and Integrative STEM Education programs are accredited by the Association for Advancing Quality in Educator Preparation

(AAQEP) and follow the learning standards of the International Technology & Engineering Education Association (ITEEA).

Seven Year Medical/Engineering

The School of Engineering offers a combined seven-year medical/engineering program in conjunction with Rutgers New Jersey Medical School (NJMS). Students in the program can pursue undergraduate studies leading to a Bachelor of Science in Biomedical Engineering. The Bachelor of Science in Biomedical Engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Bioengineering and Biomedical and Similarly Named Engineering Programs. Students in this program spend three years at TCNJ completing undergraduate coursework. Upon successful completion of the first year of medical school, the student is granted a Bachelor of Science in Biomedical Engineering from TCNJ. The MD degree is earned at the end of four years at NJMS.

For consideration into the program, the candidates must have earned a minimum SAT score of 1500 or better from the critical reading and math sections from a single test date (no exceptions will be made) or a 33 or higher composite ACT score, and hold a class rank within the top 5-percent of their class and/or have an unweighted G.P.A of at least 3.6 or 95% depending on how the school evaluates achievement. Students entering this program must hold advanced placement credit for Calculus A and Calculus B, and complete General Physics I and II in the summer prior to their first semester. Retention in the program requires students to carry an overall and semester GPA of 3.50 or higher each semester both overall and in all science courses. In addition, students must earn a B or better in the required science and engineering courses. Two interviews are required as part of the admissions process.

Mission, Vision & Values

Mission

TCNJ School of Engineering serves our community and the wider society by developing exceptional engineers and educators. Together we strive to find solutions to the problems facing the world.

Vision

TCNJ School of Engineering strives for excellence in engineering education and is committed to nurturing the next generation of engineers and educators who will shape a better world. The School provides unique experiences by using cutting edge technology, fostering innovation, incorporating sustainability into design, and developing a deep sense of community engagement.

Values

At TCNJ School of Engineering, we value:

- an ethical, inclusive, professional, and collaborative community where everyone assumes positive intent
- student-centric approaches and policies
- students who are curious, diligent, and committed to using their skills to improve the world
- master teachers who actively engage students in and out of the classroom
- a rigorous, well-rounded education provided at an excellent value

- innovative, sustainable, and thoughtful approaches to designs and research that improve society

To accomplish its mission, the School of Engineering:

- offers a broad array of exceptional academic programs including: biomedical engineering, civil engineering, computer engineering, electrical engineering, mechanical engineering, engineering science (engineering management), and STEM education;
- engages students in creating innovative design solutions that include realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, sustainability, and global considerations, and disseminating these designs at national and regional venues;
- provides undergraduate research experiences, allowing students to work closely with members of the faculty; and
- employs highly dedicated faculty members who are effective teacher-scholars committed to maintaining a learner-centered undergraduate environment with emphasis on student mentoring.