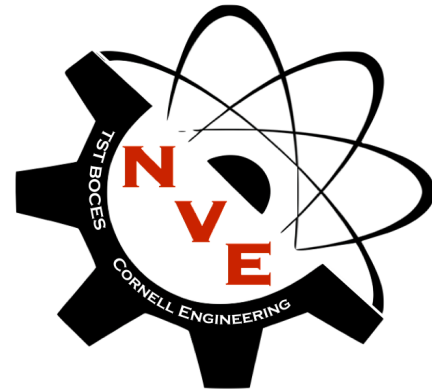


What is New Visions?

New Visions is a program offered by BOCES (Board of Cooperative Educational Services) centers across the State of New York. Our particular program, New Visions Engineering, is open only to high-achieving seniors who have demonstrated the ability to manage their time well, engage with their community in service projects, and succeed academically. Students are admitted to the program only after a rigorous application and interview process, so they must be articulate, intelligent and able to work well in a group setting. The classroom is located in Thurston Hall, on the engineering quad at Cornell University in Ithaca, NY, giving students access to world-class professors and facilities.



Prior to applying to new visions in 11th grade, potential students must have completed all of the academic requirements necessary for graduation up to that point, as well as passed all the necessary Regents exams. These requirements include three credits in English, Science, Math and Social Studies. The students must also complete the required health, physical education, second language and art and/or music credits.

Through New Visions Engineering, students are awarded high school credits for English 12, Honors; Participation in Government and Economics, Honors; and Principles of Engineering. They will also receive three credits through the University of Texas at Austin for Engineering Design and Problem Solving (ES 301), as well as four credits through Tompkins Cortland Community College for Physics I, Mechanics and Heat (PHSC 211), which is the first course in a sequence of three, calculus-based physics courses that are required by all State University of New York (SUNY) schools for those students in Engineering programs.

The course consists of a healthy blend of project-based learning and lecture, and students are encouraged and guided to make their own discoveries about the Engineering Design Process. Physics, data-driven decision-making and elements of design are all brought together in nine engineering design challenges so that in addition to learning about the process, students are actively engaged in it. These challenges cover a broad range of topics in engineering, including chemical, mechanical, electrical, aerospace, computer, biological, and civil engineering. Additionally, students are actively engaged in learning about and implementing the principles of universal design, sustainability and socially-responsible/ethical engineering.

Students are also given an immersive experience in labs on campus including the PARADIM (Platform for the Accelerated Realization, Analysis, and Discovery of Interface Materials) labs, a National user facility funded by the NSF. In the labs, students learn about growing and engineering new materials with desired properties, and then analyzing them through X-ray diffraction, electron microscopy and other techniques. Students are paired with graduate

students and actually participate in the research, operating the equipment and collecting and presenting their own data.

As a compliment to their work in the PARADIM labs, students will work with another NSF-funded organization, TANMS (Nanosystems Engineering Research Center for Translational Applications of Nanoscale Multiferroic Systems) to complete curriculum and classroom-based laboratory activities that give students an overview of materials science concepts, crystal structures and the latest developments in multiferroic materials and their applications.

Additionally, students are paired with Ph.D. candidates from various engineering fields in order to provide them a mentor. Students communicate frequently with their mentors through Slack and email, and meet in person once per month. Mentors discuss things like college applications/essays, college selection, professional vs. academic tracks and other items related to further engineering education.

Students also take field trips about once per week to local engineering firms and to other relevant facilities. Some examples include the Cornell Lake Source Cooling plant, local power plants, Lockheed Martin, engineering firms, advanced manufacturing companies, 3D-printing companies, sustainable power facilities, food science labs and many more. The purpose of these trips is to give students an immersive and first-hand look at what engineers do on a daily basis, as well as to talk directly with them about their experiences regarding their education, job search and the skills that are currently in demand.

This combination of opportunities leaves them well-prepared after graduation to seek further education in the engineering field, as well as to be productive and contributing members of their communities and the world.