



CAREER AND TECHNICAL EDUCATION

 **NEW VISIONS** ENGINEERING
CTE COURSE SYLLABUS





NEW VISIONS ENGINEERING

Course Description: Students are exposed to college level academic instruction in AP Calculus and AP Physics (c) and are given the opportunity to explore many fields of engineering through hands-on projects, site-visits, guest speakers and internship opportunities at local engineering companies.

Prerequisites: Academic prerequisites – Regents level completion of English, Science, Social Studies and Pre-Calculus.

1 Year/2 Years: 1 year - Seniors

Location: Southern Adirondack Educational Center

Course Objective: To prepare students for engineering education at the post-secondary level.

Course Topic Outline:

Civil Engineering	Mechanical Engineering
• Bridge design	• Pulleys and mechanical Advantage
• Road design	• Robot design and assembly
• Force analysis on bridges	• CNC machining
	• Solidworks
Electrical Engineering	Chemical Engineering
• Electric motor assembly	• Biodiesel
• Circuit analysis	

Student Course Requirements: Full participation

Textbooks/ Materials Resources: Calculus: Graphical, Numerical, Algebraic, Finney et al., 1999, 1st Edition
Physics for Scientists and Engineers: A Strategic Approach, Vol 1, 2013, Pearson, 3rd Edition

Assessments/ Technical Assessments: AP Calculus AB exam, AP Physics C exam – Mechanics only

Grading System: Tests 20% | Quizzes 20% | Projects 40% | Homework/Journal 5% | Labs & Activities 15%

Attendance & Class Participation: The WSWHE BOCES has an attendance policy that requires students to miss no more than 18 days across the school year. For those times when it is necessary to be absent, a written note from the parent/guardian will be expected the next class day.

Activities/Labs/ Projects/Clinics

- Build Soda Bottle bridge
- Build Truss bridge
- Build Concrete bridge
- Build Robots
- Build Rube Goldberg project
- Build Wind Turbines
- Build Wings
- Make Biodiesel fuel

The future of career success starts here.

Student Provided Material List: Flash drive, 3 inch 3-ring binder, T1 graphing calculator

Industry Certification: N/A

Articulation Agreements: N/A Students earn college credit by scoring well on AP tests in May

Related Careers/ Post-Secondary Training: 4-year engineering, science or math programs

ELA/Math Credit Integrated Academic Overview: Math/Science – 1 credit each
Engineering - 2 credits

National Technical Honor Society Nomination Requirements:

- › Maintain a cumulative CTE average of 92% or higher based upon 1st & 2nd quarter grades.
- › Maintain a record of excellent attendance in CTE (9 days per year).
- › Plan to pursue a career in their field of training.
- › Maintain an outstanding record of employability skills as judged by the CTE instructor.
- › Nomination by the CTE instructor with no reservations.
- › Instructor nomination must include a yes answer to the following characteristics established by the national office: follows instructions, safety conscious, works well with others, is dependable, trustworthy, responsible, honest, takes pride in work, exhibits a good attitude, exhibits leadership, exhibits good citizenship.

The Washington-Saratoga-Warren-Hamilton-Essex BOCES does not discriminate in its programs and activities, including employment and admission as applicable, on the basis of actual or perceived race, color, creed, sex, sexual orientation, national origin, religion, age, economic status, marital status, veterans' status, political affiliation, domestic victim status, use of a guide dog, hearing dog or service dog, disability, or other classifications protected under federal or state law, and provides equal access to the Boy Scouts and other designated youth groups. The designated district compliance officers will coordinate compliance with the nondiscrimination requirements of Title VI and Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, as amended, the Boy Scouts of America Equal Access Act, and the New York State Human Rights Law. The BOCES Compliance Officers are: Turina Parker and Ronald Black, Washington-Saratoga-Warren-Hamilton-Essex BOCES, 1153 Burgoyne Avenue, Suite 2, Fort Edward, NY 12828. phone: (518) 746-3310, email: tparker@wswhiboces.org or rblack@wswhiboces.org. Complaints may also be filed with the Office for Civil Rights, New York Office, U.S. Department of Education, 32 Old Slip, 26th Floor, New York, NY 10005-2500, phone (646) 428-3800, fax (646) 428-3843, email: OCR.NewYork@ed.gov