



CAREER AND TECHNICAL EDUCATION

# MACHINE TOOL TECHNOLOGY

## **CTE COURSE SYLLABUS**





# MACHINE TOOL TECHNOLOGY

<b>Course Description:</b>	A two-year program based on the National Institute for Metalworking Skills (NIMS) standards and related curriculum. Heavy emphasis on high tech equipment and precision in the machining of component parts. Students fabricate component parts to specification using milling, drilling, turning, grinding, and boring machines. Students learn career management, employee relations, teamwork, interpersonal relations, applied math, applied communication skills, and social skills.
<b>Prerequisites:</b>	Math and Science would be great background information to use. We will also bring the student up to speed on these subjects for industry standards.
<b>1 Year/2 Years:</b>	1 year; Completion Certificate   2 years; Diploma, Technical Assessment; NOCTI Level I
<b>Location:</b>	Southern Adirondack Educational Center
<b>Course Objective:</b>	Students will gain the knowledge and skills adapted from the NIMS (National Institute for Metalworking Skills) industry standard curriculum. Students are prepared for entry-level employment in a machining facility and/or post-secondary education opportunities in the machine tool technology field. The Students will use the appropriate tools, machines and practice safety to produce projects designed around parts made in Machine Shops.
<b>Course Topic Outline:</b>	Students are instructed and tested on their skills learned when they produce projects using saws; grinders for sharpening tooling; surface grinders; drilling machines; lathes; milling machines; CNC machines and programming. They are observed working in the shop practicing safety and proper tool and machine maintenance plus house keeping procedures.
<b>Student Course Requirements:</b>	Math background recommended, will train for industry needs.
<b>Textbooks/ Materials Resources:</b>	<ul style="list-style-type: none"><li>• Technology of Machining Textbook</li><li>• Machine Shop Mathematics Workbook</li><li>• 7 Haas programming simulators</li><li>• 2 Haas CNC Milling Machines</li><li>• Shop Reference Manual</li><li>• Blueprints, Solidworks CAD Program</li><li>• 2 Haas CNC Lathes</li><li>• CNC Programming Principals and Applications</li></ul>
<b>Assessments/ Technical Assessments:</b>	Quizzes, Unit tests, Performance tests (parts made), Projects NOCTI Precision Machining written and performance assessment. Student portfolio
<b>Grading System:</b>	Quizzes 15%   Projects 40%   In-Class Assignments 20%   Tests 20%   Homework/Journal 5%
<b>Attendance &amp; Class Participation:</b>	<p>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 call notifying the guidance office and class is required. A written note from the parent/guardian will be necessary the next class day for the student to re-enter the class. Make up sheets are also required for the student to obtain a grade for the absence and make up any missed work.</p> <p>Do assigned work such as reading, chapter questions, shop practice and projects assigned for grading. Work in the shop safely and practice good housekeeping.</p>

# The future of career success starts here.

## Activities/Labs/ Projects/Clinics

- Lecture; 10-30 minutes
- Demonstrations; 10-20 minutes
- Shop practice, cleanup remainder of class
- Portfolio
- Student internship

## Student Provided Material List:

Safety Work Boots, Pants (no shorts), Apron or a work shirt,  
Scientific Calculator (trig functions), Notebook

## Industry Certification:

We follow the NIMS (National Institute of Metal Working Systems) curriculum; this sets the standards to follow to train students to take the NOCTI exam at the end of their senior year.

## Articulation Agreements:

Each Career and Technical Education (CTE) program is geared to ready students for the world of work and for the rigors of post-secondary coursework. To that end, each program has worked with area colleges to obtain articulation agreements that allow for advance standing or the issuance of credit to those CTE students meeting all program requirements and articulation agreement standards. A formal agreement is currently in place with:

› Alfred State College

## Related Careers/ Post-Secondary Training:

This can be a great background for any mechanical field, such as engineering, programming and CAD design. It is recommended to continue to college for getting a degree in machining, expand on training and to serve an apprentice program in the machining field.

## ELA/Math Credit Integrated Academic Overview:

Each CTE program offered at the WSWHE BOCES has five (5) major curriculum elements that are acquired over a one year or two year period. Two (2) of the five (5) curriculum elements include English Language Arts and Mathematics. These program elements are taught using a co-teaching model, which teams the CTE subject experts and certified English and Math instructors. Topics in English and Math are tied to specific business and industry course content, which illustrates to students how academic material and business knowledge and skill relate to one another. English and Math elements are taught at the commencement level and meet NYS Standards for students to obtain one (1) credit for each over a two-year period. Program specifics are as follows:

Commencement Level Math. . . . . 54 hours/yr  
English Language Arts. . . . . 54 hours/yr  
1 credit = 108 hours

## Career & Financial Management Credit Overview:

Each CTE program offered at the WSWHE BOCES offers a Career & Financial Management credit to all students who successfully complete a CTE program. This curriculum element is comprised of two major parts; (A) Introduction to Occupations and (B) Nature of Industry. Part A is delivered through integrated class assignments, while Part B is automatically delivered due to the nature of CTE.

**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.

**Student Affiliated Organization:**

- › SkillsUSA
- › Student Council
- › SADD

**WBL Experiences/ Requirements:**

Each CTE program has a Work-Based Learning experience. This means that all students prior to the end of the second year are given the opportunity to be exposed to the operation of a business and specific job duties related to careers in their CTE area. This internship is designed to connect the skills and knowledge learned in the CTE classroom with the real world requirements of a business. Students must demonstrate good attendance, attitude, internship records, and work ethics, as well as respect for others and property.

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](mailto:tparker@wswhiboces.org) or [rblack@wswhiboces.org](mailto: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](mailto:OCR.NewYork@ed.gov)