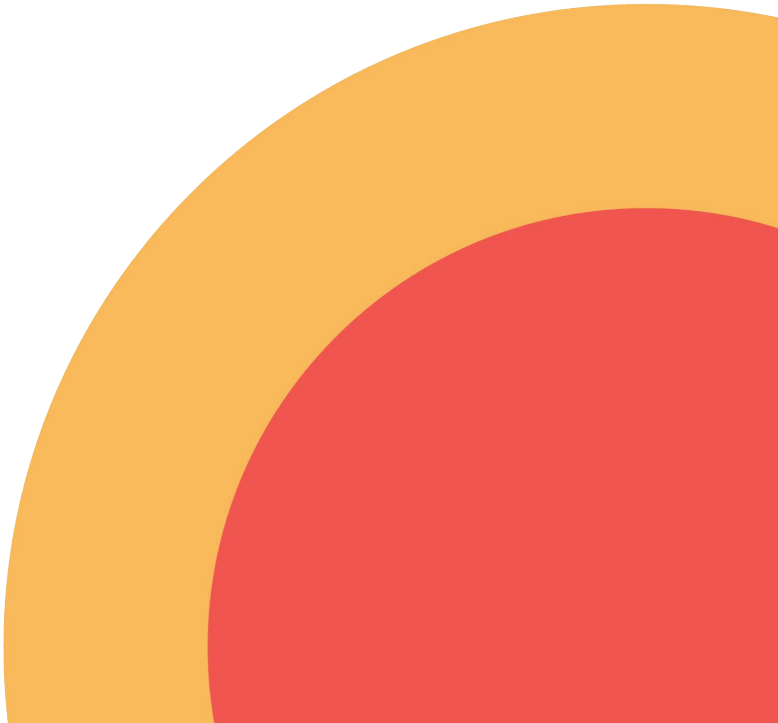
Manufacturing Skills for Connecticut:

# Review of Hamden High School's Hamden Engineering Careers Academy



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# Background

This program review report includes observations and key takeaways from data collected as part of the Manufacturing Skills for Connecticut (MSforCT) project and specific to Hamden High School's Hamden Engineering Careers Academy (HECA). The report summarizes information gathered by WestEd between November 2020 and June 2021 through document reviews, surveys, and virtual site visits.

## Manufacturing Skills for Connecticut Project Description [1]

Throughout Connecticut, significant gaps exist in the state's manufacturing workforce development system, most notably the dearth of comprehensive education, recruitment, and well-developed career pathways that, collectively, serve to connect industry to education. To address these issues CONNSTEP, in partnership with ReadyCT, the Connecticut Business & Industry Association (CBIA), and the Connecticut Manufacturers' Collaborative (CMC), designed the MSforCT project. The CMC includes all the major regional and statewide manufacturing member organizations across Connecticut, representing over 1200 manufacturing companies with tens of thousands of employees throughout all of Connecticut.

Funded through a grant from the U.S. Department of Commerce National Institute of Standards and Technology (NIST), the MSforCT project aimed to increase and improve career pathways to advanced manufacturing within the K-12 school system. To better understand which programs and models are most effective, remove the silos in which promising programs are operating, and share best practices, the project proposed to:

- complete a comprehensive inventory and analysis of manufacturing career pathway programs and initiatives across schools/districts;
- conduct program reviews of a subset of programs;
- and build a web-based repository of effective career pathway programs and key criteria for the creation of new programs. This site will also serve as an online community of practice accessible to school districts, business associations, and postsecondary institutions.

CONNSTEP contracted with WestEd, a nonprofit educational research, development, and service organization, to conduct the comprehensive inventory and program review. This report summarizes only a portion of the data collected during the overall project period. Specifically, this report focuses on Hamden High School's Hamden Engineering Careers Academy, one of the 13 programs that were selected for program reviews, and includes information collected via a state-wide online survey conducted in January 2021 and virtual site visit conducted in May/June 2021.

[1] Project description adapted from ReadyCT's Manufacturing Skills for Connecticut webpage and *Manufacturing Skills for Connecticut Project Abstract*

# Hamden High School's Hamden Engineering Careers Academy

## Regional Information

Hamden High School is in the South Central part of the state within New Haven county. The New Haven region is home to Yale University, Quinnipiac University, Albertus Magnus College, the University of New Haven, Southern Connecticut State University and Gateway Community College, making it a hub for both talented, highly educated workers and entrepreneurs alike. The growing corporate base of the region has a flourishing biotech industry, high-tech aerospace and medical manufacturing and a technology cluster[2]. New Haven County is home to 1,413 manufacturing sector employers[3]. Workforce Alliance serves as the Workforce Investment Board for this region. According to the most recent US Census Bureau statistics, Hamden has an estimated population of 60,556, a median household income of $77,274, with 8.8% of persons living in poverty[4]. Hamden's vacancy rate for manufacturing is lowest in the region. In 2010, 5.13% of Hamden's businesses were comprised of the manufacturing industry, more than the national percentage. Major manufacturers in Hamden include Airline Accessory Service Co. LLC, Amphenol Corporation - Spectra Strip, B-P Products, Bar-Plate Manufacturing Company, Burt Processing Equipment, Can Straps LLC, Carlton Industries, Cummings Steel Company, Dexsil, EZ Form Cable, International Provisions Inc., Leed-Himmel Industries, Meyer Wire and Cable Company, New England CNC Inc., Porcelain SPECRAIL, Precision Grinding Solutions/Aero Grind Holdings LLC, Record Products of America, Speciality Wire & Cord Sets Inc., Paylor Freezer of Connecticut, Tomtec Inc., Transact Technologies, and Winning Ice Systems[5].

## District, School, and Program Overview

There are 5,495 students across 21 different schools or programs in the Hamden School District. According to 2019-20 data in Edsight[6], the district of Hamden is 48.1% female and 34% white. 6.3% of students identify as English learners, 48.9% qualify for free and reduced lunch and 18.3% identify as students with disabilities. 56% of students attend 4-year institutions and 12% attend 2-year institutions in the fall immediately following high school. Hamden is one of 33 Alliance Districts in CT; these are school districts with among the lowest Accountability Index measures in the state[7]. The Hamden Engineering Careers Academy started in 2019 and is funded by the Perkins V grant in addition to a grant that Representative D'Agostino (Democrat, Hamden) helped the district secure to support program startup costs. The program is intended to begin in the 9th

[2] Choose Connecticut - Regional Information
[3] Connecticut Department of Labor - Employer List
[4] United States Census Bureau - Hamden town, New Haven County, Connecticut
[5] Hamden Economic & Neighborhood Development - Manufacturing Cluster
[6] Edsight - Home
[7] CT. gov - Alliance Districts

grade; the first cohort is entering their third year of the program in fall 2021. Hamden has a partnership with Gateway Community College to offer dual enrollment courses at the high school.

# Program Inventory Review

ReadyCT and WestEd worked together throughout fall 2020 to develop a comprehensive statewide inventory of K-12 Advanced Manufacturing Programs. To identify existing programs, WestEd used Google Forms and consulted with ReadyCT, the Connecticut State Department of Education (CSDE), and industry partners. At the end of this effort, the team had identified over 140 programs related to advanced manufacturing programs. A list of all programs identified can be found in Appendix A.

# Survey and Site Selection Overview

WestEd researchers developed and disseminated an online survey to capture basic program data and inform the selection of programs to be reviewed.

## Survey Development

The project team utilized several sources to develop a rubric to define high-quality, high-impact programs, including the Association for Career & Technical Education (ACTE)[8], Society of Manufacturing Engineers (SME) and SME Education Foundation[9], National Association of Manufacturers (NAM)[10], and United States Department of Labor, Employment and Training Administration[11]. Survey questions were then developed to mirror the rubric and focused on five broad categories:

- Curriculum Standards and Competencies
- Business and Community Partnerships
- Career Development Offerings
- Sequencing and Articulation
- Access and Equity

## Survey Dissemination

WestEd administered an online survey to manufacturing programs from February 3, 2021 through March 12, 2021. A total of 47 schools responded providing information on 51 programs,

[8]Association for Career & Technical Education (ACTE) - 12 Elements of a High-quality CTE Program of Study
[9] Society of Manufacturing Engineers (SME) & SME Education Foundation - Four Pillars of Manufacturing Knowledge
[10] National Association of Manufacturers (NAM) - NAM-endorsed Skills Certification System
[11] United States Department of Labor, Employment and Training Administration - Advanced Manufacturing Competency Model

representing a 33 percent response rate. A list of all survey respondents can be found in Appendix B.

### Site Selection

The project team used a combination of survey responses , site demographics, and industry recommendations to identify the manufacturing programs that would be invited to participate in a program review of high-quality, high-impact manufacturing programs. Using the rubric created (see Appendix D) during the survey development phase, WestEd researchers scored and ranked each completed survey. A higher survey score indicated that, based on the rubric, the program was more closely aligned with elements of a high-quality, high-impact program. However, it is also important to note the limitations of this approach to identifying high-quality, high-impact programs. The primary limitations are that the programs were chosen among only a sample of manufacturing programs that completed the survey; not all surveys provided complete responses; and surveys were completed by respondents playing diverse roles with differing levels of programmatic knowledge. Thus, the sample from which the team identified high-quality, high-impact programs is limited by self-selection and the self-reported nature of the data source. It is possible that other manufacturing programs not responding to the survey are indeed high-quality and/or the programs chosen among the survey respondents provided incomplete or inaccurate information.

In addition to survey rankings, the research team considered ReadyCT's input as it further analyzed the program list. To ensure that the sample included variation, the project team considered region, urban-rural classification, and socioeconomic and diversity indexes to select a list of finalists that were eligible to participate in the program review. Finally, stakeholder feedback was incorporated into the project team's finalist list. The goal was to identify a group of sites that consisted of both programs of interest to the CMC and programs that were willing and able to participate in the evaluation. The final list of programs selected for review can be found in Appendix C.

## Visit Overview

WestEd researchers conducted focus groups and interviews with stakeholders from Hamden High School's Hamden Engineering Careers Academy (HECA) program over the weeks of May 10th and May 17th, 2021. Due to the ongoing coronavirus pandemic and travel restrictions, the activities were held virtually using an online video conferencing system. The purpose of the focus groups and interviews was to gather information on program characteristics and activities to supplement data captured via the survey. Additionally, the focus groups and interviews gathered information from key stakeholders about program strengths and challenges and solicited recommendations. The focus groups and interviews were tailored to stakeholders' roles as below.

- An interview with the lead teacher
- An interview with the superintendent

- An interview with the coordinator of counseling and career pathways
- An interview with a business partner
- An interview with a state representative
- An interview with the director of innovation, technology and communications
- A focus group with three students
- A focus group with the Gateway Community College partners

# Program Review Results

The sections below synthesize information gathered through the program's documents, survey response, and virtual site visit. The results are organized by the framework that most influenced the site selection rubric—the 12 areas of high-quality CTE that were developed by the Association for Career & Technical Education (ACTE).

### Summary by 12 Areas of High-Quality CTE

*Standards-aligned and Integrated Curriculum*

The curriculum used at Hamden High School is based on industry recognized standards and was developed by Gateway Community College. Hamden and Gateway worked together to determine the curriculum that would be offered at the high school as part of the dual enrollment courses. The partners at Gateway observe classes once a semester, and also provide support to the teacher whenever clarification is needed.

*Sequencing and Articulation*

Currently, there is a series of classes to be taken each year over the course of the four-year program being offered at Hamden. Students take most of their courses during the academic year and there is also a summer component to the curriculum. Students take a mathematics assessment to determine whether they need to take a course over the summer or can begin with the program's first mathematics course. Additionally, some students need to take their PE credit over the summer due to lack of availability in their course schedules during the academic year. As a modification, the program allows students to take an additional year to complete the program if they are not able to fit all their classes into their schedule. This allows students to take more time to receive their associate degree in high school as well as additional certifications if they choose. The associate degree pathway requires a total of 65 college credits along with 30.7 Hamden HS credits. However, if students do not want to complete the associate degree, they can complete just the course requirements for the certificates. There are eight required courses for computer-aided design (CAD) and six required courses for quality control (QC). There is a plan of study that HECA provides to indicate which courses students should take during which semester in order to complete requirements. However, due to the fact that the HECA program has not graduated their first cohort yet, the entirety of the course curriculum has not yet been taken or administered. According to students, the associate degree pathway was a significant selling point for students

who were considering joining the program, as it would alleviate the financial burden of attending a full four years of postsecondary education. Students also shared that they are required to take additional courses, such as a career development class, which helps them with public speaking, resumes, and cover letters.

### *Student Assessment*

Students are primarily assessed through project-based learning. Researchers heard that the teachers assess student work in class primarily through projects. For example, students in one class were given data in excel and asked to manipulate the data and conduct analysis before writing a report on their findings. The goal was to simulate a real-world problem that students might encounter in their future careers. Students are also required to complete any assessments that are included in the Gateway curriculum. Students are, at times, allowed to redo assignments or request extra time if needed; this has been especially pertinent due to the changes brought on by COVID-19.

### *Prepared and Effective Program Staff*

There are currently two teachers involved in this program, one who was hired in 2019 as the program was beginning and an additional teacher who was recently hired. The new teacher audited the class at Gateway Community College prior to teaching the course in order to become familiar with the material. The Gateway partners also indicated that they require the teachers to participate in professional development annually, which can occur in multiple ways such as through workshops or seminars. As the program continues to develop and additional teachers are hired, more training will likely be needed to give teachers the skills needed to teach the manufacturing courses.

### *Engaging Instruction*

There are about 19 students in each class due to the limited number of computers available to students. This is a diverse group of students needing varying degrees of support in the classroom. Researchers heard that the classroom teacher is the primary support provided to the student in the classroom and is familiar with each student's educational background, such as an individualized education program (IEP) if they have one. Additionally, prior to entering the program, the program director identifies the needs of students by reviewing IEPs and 504 plans prior to entry so modifications can be written as needed. Students described their learning as a hands-on experience and shared how they were able to use equipment such as 3D printers and learn how to code on their computers. However, there have been changes to machine usage due to pandemic related restrictions and a limited number of students being allowed in a space at once.

### *Access and Equity*

The program currently has 38 seats and students are selected into the program through a weighted lottery. Students who are not accepted into the program are placed on a waitlist. During the initial year of the program Hamden hosted an information meeting that attracted 125 families.

Twenty-five students were actively recruited for 36 spots, however the program received over 70 applications which led to the creation of a ranked waitlist. After their initial application, selected students participate in an interview. From there, the weighted lottery is conducted, and students are accepted into the program. The staff at Hamden emphasized a focus on ensuring diversity within the program and ensuring that it is representative of the community. There is an overarching goal of continuing to diversify the demographics of the cohort to align it with the population of the school. Students also play a role in marketing the program to incoming high school students to boost enrollment. They met with 8th grade students during a virtual field trip to share their personal interests and reasons for joining the program.

*Facilities, Equipment, Technology and Materials*

Students in the program are equipped with more advanced computers than their non-manufacturing peers at the school. These devices are set up with Microsoft Suite as well as various software programs that students need to do 2D and 3D modeling, such as AutoCAD and SolidWorks. These computers are also used to help students program the larger machines. There are also 3D printers and CNC machines available to students. The students interviewed indicated that they would learn how to use the larger and more advanced machines in the following academic year as well as have greater access to machine usage once they are able to be back in school full time.

*Business and Community Partnerships*

Partnerships were key to building and supporting the program. Representative D'Agostino already had a relationship with the district after previously serving on the local Board of Education. He knew the administration and met with them annually to discuss their priorities. When the program director proposed the idea, Rep. D'Agostino (Democrat, Hamden) was able to work with her on the state application process to receive state bond funding for $500,000, which was invested in the development of STEM programs at Hamden High School. Many individuals spoke to the value of this relationship to fund the program and equipment because district funding could not support the startup cost. ManufactureCT (formerly New Haven Manufacturers Association) was involved in the initial curriculum development, however, has been unable to meet with students due to the pandemic and school restrictions.

*Student Career Development*

Student career development is supported through the courses offered during the program. As stated above, students are required to take a course in employability skills which improves their career planning and job search skills. They are also able to receive certifications through the program such as CAD or Quality Control. While the ongoing pandemic has hindered plans, the Gateway partners shared that in the coming year, students will be introduced to the different departments and offices on campus that can support them.

*Career and Technical Student Organizations (CTSOs)*

Hamden currently offers STEM related extracurricular activities, however none that are directly tied to HECA or its curriculum. Students shared that there are different clubs that they can join including a robotics club and an engineering club, but no official CTSOs. While students were not aware of the CTSOs, the survey data completed prior to the site visit, indicated that the school does in fact have two CTSOs: TSA and DECA. This discrepancy may have been a result of students misunderstanding the official language of Career and Technical Student Organizations or a lack of awareness.

*Work-based Learning*

The work-based learning aspect of Hamden's program has not begun yet. This piece of the program is designed to begin in the third year of the program. The first cohort of students is about to enter their third year and therefore will be the first group to experience off campus work-based learning during the 2021-2022 school year.

*Data and Program Improvement*

Demographic information on students is collected as well as information on student persistence in the program. There is currently no formal method of data collection regarding the program and its outcomes. This is likely the result of the infancy of the program and the fact that the initial cohort is only just now completing their second year amid a pandemic.

## Final Reflections and Takeaways

Overall, the students and staff showed strong enthusiasm about the implementation of the HECA program at Hamden. There was a strong emphasis on the value of partnerships and strong leadership. Researchers spoke to several individuals who credited the initiation of the program to the Director of Innovation, Technology and Communications and Coordinator of Counseling and Career Pathways. They were the main drivers in securing the funding and getting the program off the ground. Having strong leaders and partners to champion the work was a major theme in the launching of the program at Hamden.

# Appendix A: Inventory of CT K-12 Advanced Manufacturing Programs, by District

**Ansonia School District**

Ansonia High School, Ansonia, CT

**Berlin School District**

Berlin High School, Berlin, CT

**Bolton School District**

Bolton High School, Bolton, CT

**Bridgeport School District**

Bassick High School, Bridgeport, CT
Bridgeport Regional Vocational Aquaculture School, Bridgeport, CT
Central High School, Bridgeport, CT
Fairchild Wheeler Interdistrict Multi-Magnet High School, Bridgeport, CT
Kolbe Cathedral High School, Bridgeport, CT
Warren Harding High School, Bridgeport, CT

**Bristol School District**

Bristol Central High School, Bristol, CT
Bristol Eastern High School, Bristol, CT

**Brookfield School District**

Brookfield High School, Brookfield, CT

**Capitol Region Education Council**

Academy of Aerospace and Engineering, Windsor, CT

**Cheshire School District**

Cheshire High School, Cheshire, CT

**Clinton School District**

The Morgan School, Clinton, CT

**Colchester School District**

Bacon Academy, Colchester, CT

**Connecticut Technical Education and Career System (CTECS)**

A. I. Prince Technical High School, Hartford, CT
Bristol Technical Education Center, Bristol, CT
Bullard-Havens Technical High School, Bridgeport, CT
E. C. Goodwin Technical High School, New Britain, CT
Eli Whitney Technical High School, Hamden, CT
Ella T. Grasso/Southeastern Technical High, Groton, CT
Emmett O'Brien Technical High School, Ansonia, CT
H. C. Wilcox Technical High School, Meriden, CT
Harvard H. Ellis Technical High School, Danielson, CT
Henry Abbott Technical High School, Danbury, CT
Howell Cheney Technical High School, Manchester, CT
J.M. Wright Technical High School, Stamford, CT

Norwich Technical High School, Norwich, CT
Oliver Wolcott Technical High School, Torrington, CT
Platt Technical High School, Milford, CT
Vinal Technical High School, Middletown, CT
W. F. Kaynor Technical High School, Waterbury, CT
Windham Technical High School, Windham, CT

**Coventry School District**

Coventry High School, Coventry, CT

**Cromwell School District**

Cromwell High School, Cromwell, CT

**Danbury School District**

Danbury High School, Danbury, CT

**Darien School District**

Darien High School, Darien, CT

**Derby School District**

Derby High School, Derby, CT

**East Granby School District**

East Granby High School, East Granby, CT

**East Haddam School District**

Nathan Hale-Ray High School, Moodus, CT

**East Hartford School District**

East Hartford High School, East Hartford, CT
Synergy Alternative High School, East Hartford, CT
Woodland School, East Hartford, CT

**East Haven School District**

East Haven High School, East Haven, CT

**East Lyme School District**

East Lyme High School, East Lyme, CT

**Eastern Connecticut Regional Educational Service Center (EASTCONN)**

Quinebaug Middle College, Danielson, CT

**Ellington School District**

Ellington High School, Ellington, CT

**Enfield School District**

Enfield High School, Enfield, CT

**Fairfield School District**

Fairfield Ludlowe High School, Fairfield, CT
Fairfield Warde High School, Fairfield, CT

**Farmington School District**

Farmington High School, Farmington, CT

**Glastonbury School District**

Glastonbury High School, Glastonbury, CT

**Granby School District**

Granby Memorial High School, Granby, CT

**Greenwich School District**

Greenwich High School, Greenwich, CT

**Griswold School District**

Griswold High School, Griswold, CT

**Groton School District**

Robert E. Fitch High School, Groton, CT

**Guilford School District**

Guilford High School, Guilford, CT

**Hamden School District**

Hamden High School, Hamden, CT

**Hartford School District**

Hartford Public High School, Engineering & Green Technology Pathway, Hartford, CT

Pathways Academy of Technology & Design, East Hartford, CT

**Killingly School District**

Killingly High School, Killingly, CT

**LEARN**

Connecticut River Academy, East Hartford, CT

**Lebanon School District**

Lyman Memorial High School, Lebanon, CT

**Ledyard School District**

Ledyard High School, Ledyard, CT

**Madison School District**

Daniel Hand High School, Madison, CT

**Manchester School District**

Manchester High School, Manchester, CT

**Meriden School District**

Francis T. Maloney High School, Meriden, CT

Orville H. Platt High School, Meriden, CT

**Middletown School District**

Middletown High School, Middletown, CT

**Milford School District**

Joseph A. Foran High School, Milford, CT

The Academy, Milford, CT

**Milford School District**

Jonathan Law High School, Milford, CT

**Monroe School District**

Masuk High School, Monroe, CT

**Montville School District**

Montville High School, Oakdale, CT

**New Britain School District**

New Britain High School, New Britain, CT

**New Canaan School District**

New Canaan High School, New Canaan, CT

**New Haven School District**

Metropolitan Business Academy, New Haven, CT
Riverside Education Academy, New Haven, CT

**New Haven School District**

Engineering - Science University Magnet School, West Haven, CT
Wilbur Cross High School, New Haven, CT

**New London School District**

New London High School, New London, CT

**Newtown School District**

Newtown High School, Sandy Hook, CT

**North Stonington School District**

Wheeler High School, North Stonington, CT

**Norwich Free Academy**

Norwich Free Academy, Norwich, CT

**Old Saybrook School District**

Old Saybrook High School, Old Saybrook, CT

**Plainfield School District**

Plainfield High School, Plainfield, CT

**Plainville School District**

Plainville High School, Plainville, CT

**Plymouth School District**

Terryville High School, Terryville, CT

**Portland School District**

Portland High School, Portland, CT

**Regional School District 1**

Housatonic Valley Regional High School, Falls Village, CT

**Regional School District 4**

Valley Regional High School, Deep River, CT

**Regional School District 5**

Amity Regional High School, Woodbridge, CT

**Regional School District 7**

Northwestern Regional High School, Winsted, CT

**Regional School District 8**

RHAM High School, Hebron, CT

**Regional School District 10**

Lewis S. Mills High School, Burlington, CT

**Regional School District 12**

Shepaug Valley School, Washington, CT

**Regional School District 15**

Pomperaug High School, Southbury, CT

**Regional School District 16**

Woodland Regional High School, Beacon Falls, CT

**Regional School District 17**

Haddam-Killingworth High School, Higganum, CT

**Regional School District 18**

Lyme-Old Lyme High School, Old Lyme, CT

**Regional School District 19**

E. O. Smith High School, Storrs, CT

**Rocky Hill School District**

Rocky Hill High School, Rocky Hill, CT

**Seymour School District**

Seymour High School, Seymour, CT

**Shelton School District**

Shelton High School, Shelton, CT

**Simsbury School District**

Simsbury High School, Simsbury, CT

**Somers School District**

Somers High School, Somers, CT

**South Windsor School District**

South Windsor High School, South Windsor, CT

**Southington School District**

Southington High School, Southington, CT

**Stafford School District**

Stafford High School, Stafford Springs, CT

**Stamford School District**

The Academy of Information Technology, Stamford, CT

**Stonington School District**

Stonington High School, Stonington, CT

**Stratford School District**

Frank Scott Bunnel High School, Stratford, CT

**Stratford School District**

Stratford High School, Stratford, CT

**Suffield School District**

Suffield High School, Suffield, CT

**Thomaston School District**

Thomaston High School, Thomaston, CT

**Thompson School District**

Tourtellotte Memorial High School, North Grosvenordale, CT

**Torrington School District**

Torrington High School, Torrington, CT

**Trumbull School District**

Trumbull High School, Trumbull, CT

**Unified School District #1**

State of Connecticut Department of Correction, Wethersfield, CT

**Vernon School District**

Rockville High School, Vernon, CT

**Wallingford School District**

Lyman Hall High School, Wallingford, CT

Mark T. Sheehan High School, Wallingford, CT

**Waterbury School District**

Waterbury Career Academy, Waterbury, CT

**Waterbury School District**

Crosby High School, Waterbury, CT

John F. Kennedy High School, Waterbury, CT

Wilby High School, Waterbury, CT

**Waterford School District**

Waterford High School, Waterford, CT

**Watertown School District**

Watertown High School, Watertown, CT

**West Hartford Public Schools**

Conard High School, West Hartford, CT

William H. Hall High School, West Hartford, CT

**West Haven School District**

West Haven High School, West Haven, CT

**Westbrook School District**

Westbrook High School, Westbrook, CT

**Wethersfield School District**

Wethersfield High School, Wethersfield, CT

**Windham School District**

Windham High School, Windham, CT

**Windsor School District**

Windsor High School, Windsor, CT

**Windsor Locks School District**

Windsor Locks High School, Windsor Locks, CT

**Wolcott School District**

Wolcott High School, Wolcott, CT

**Woodstock Academy**

The Woodstock Academy, Woodstock, CT

# Appendix B: CT Advanced Manufacturing Program Survey Respondents, by District

**Ansonia School District**
- Ansonia High School, Ansonia, CT

**Bridgeport School District**
- Bassick High School, Bridgeport, CT

**Bristol School District**
- Bristol Central High School, Bristol, CT
- Bristol Eastern High School, Bristol, CT

**Cheshire School District**
- Cheshire High School, Cheshire, CT

**Colchester School District**
- Bacon Academy, Colchester, CT

**Connecticut Technical Education and Career System (CTECS)**
- Bristol Technical Education Center, Bristol, CT
- Bullard-Havens Technical High School, Bridgeport, CT
- Eli Whitney Technical High School, Hamden, CT
- H. C. Wilcox Technical High School, Meriden, CT
- Harvard H. Ellis Technical High School, Danielson, CT
- Platt Technical High School, Milford, CT
- Vinal Technical High School, Middletown, CT
- W. F. Kaynor Technical High School, Waterbury, CT

**Coventry School District**
- Coventry High School, Coventry, CT

**East Granby School District**
- East Granby High School, East Granby, CT

**East Haddam School District**
- Nathan Hale-Ray High School, Moodus, CT

**East Hartford School District**
- East Hartford High School, East Hartford, CT

**East Haven School District**
- East Haven High School, East Haven, CT

**Eastern Connecticut Regional Educational Service Center (EASTCONN)**
- Quinebaug Middle College, Danielson, CT

**Glastonbury School District**
- Glastonbury High School, Glastonbury, CT

**Griswold School District**
- Griswold High School, Griswold, CT

**Hamden School District**
- Hamden High School, Hamden, CT

**Hartford School District**

HPHS Academy of Engineering & Green Technology, Hartford, CT

**LEARN**

Connecticut River Academy, East Hartford, CT

**Lebanon School District**

Lyman Memorial High School, Lebanon, CT

**Madison School District**

Daniel Hand High School, Madison, CT

**Manchester School District**

Manchester High School, Manchester, CT

**New Britain School District**

New Britain High School, New Britain, CT

**Plainfield School District**

Plainfield High School, Plainfield, CT

**Plainville School District**

Plainville High School, Plainville, CT

**Regional School District 16**

Woodland Regional High School, Beacon Falls, CT

**Regional School District 8**

RHAM High School, Hebron, CT

**Rocky Hill School District**

Rocky Hill High School, Rocky Hill, CT

**South Windsor School District**

South Windsor High School, South Windsor, CT

**Stonington School District**

Stonington High School, Stonington, CT

**Suffield School District**

Suffield High School, Suffield, CT

**Thomaston School District**

Thomaston High School, Thomaston, CT

**Thompson School District**

Tourtellotte Memorial High School, North Grosvenordale, CT

**Torrington School District**

Torrington High School, Torrington, CT

**Unified School District #1**

State of Connecticut Department of Correction, Wethersfield, CT

**Wallingford School District**

Lyman Hall High School, Wallingford, CT

**Waterbury School District**

Waterbury Career Academy, Waterbury, CT

**West Hartford Public Schools**

Conard High School, West Hartford, CT

William H. Hall High School, West Hartford, CT

**Windham School District**

Windham High School, Windham, CT

**Windsor School District**

Windsor High School, Windsor, CT

# Appendix C: Final List of CT Programs Selected for Review

| |
|---|
| **Bacon Academy Manufacturing at Bacon Academy**<br>Colchester School District, Colchester, CT |
| **Bristol Manufacturing Production Pathway at Bristol Central & Bristol Eastern High Schools**<br>Bristol School District, Bristol, CT |
| **Early College Advanced Manufacturing Program at Connecticut River Academy**<br>LEARN Regional Education Service Center, East Hartford, CT |
| **Precision Machining Technology at Eli Whitney Technical High School**<br>Connecticut Technical Education and Career System (CTECS), Hamden, CT |
| **Hamden Engineering Careers Academy at Hamden High School**<br>Hamden School District, Hamden, CT |
| **Intro to Manufacturing at Lyman Hall High School**<br>Wallingford School District, Wallingford, CT |
| **Manchester Public Schools Manufacturing Program at Manchester High School**<br>Manchester School District, Manchester, CT |
| **Academy of Manufacturing, Engineering & Technology (MET) at New Britain High School**<br>New Britain School District, New Britain, CT |
| **Manufacturing for Industry: YMPI with EWIB at RHAM High School**<br>Regional School District 8, Hebron, CT |
| **Manufacturing Pathway at Tourtellotte Memorial High School**<br>Thompson School District, North Grosvenordale, CT |
| **Precision Machining Technology at Vinal Technical High School**<br>Connecticut Technical Education and Career System (CTECS), Middletown, CT |
| **Manufacturing Academy at Waterbury Career Academy**<br>Waterbury School District, Waterbury, CT |
| **Career and Technical Education at Windsor High School**[12]<br>Windsor School District, Windsor, CT |

[12] Windsor High School declined to participate in the program review.

## Appendix D: Scoring Rubric

| Category Name | Full Question | Response Required to Receive Point | Related High-quality CTE Program Element | Element-Weighted Score | Non-Weighted Score |
|---|---|---|---|---|---|
| Identified Student Populations | Has your program identified student populations in your vicinity that are typically underserved educationally or underemployed due to educational, economic or other barriers? | Yes | Access and Equity | 0.3333333333 | 1 |
| Identified Root Causes | Has your program identified the root causes of identified gaps in participation and performance of these student groups? | Yes | Access and Equity | 0.3333333333 | 1 |
| Orgs to Support Access & Equity | Has your program utilized any organizations and/or resources to support your efforts related to access and equity? | Yes | Access and Equity | 0.3333333333 | 1 |
| Business Partnerships | Is your program involved in any business partnerships? | Yes | Business and Community Partnerships | 0.5 | 1 |
| Community Partnerships | Is your program involved in any community partnerships (i.e., partnerships with nonprofit organizations, public agencies, and/or government offices)? | Yes | Business and Community Partnerships | 0.5 | 1 |

| Category Name | Full Question | Response Required to Receive Point | Related High-quality CTE Program Element | Element-Weighted Score | Non-Weighted Score |
|---|---|---|---|---|---|
| CTSOs | Has your school established one or more Career and Technical Student Organizations (CTSOs)? | Yes | Career and Technical Student Organizations (CTSOs) | 1 | 1 |
| Age: > 5 Years | Calculated age using starting year provided | > 5 Years | Data and Program Improvement | 0.5 | 1 |
| Program Data | Please describe the types of data the program collects and how data are used. | Response Provided | Data and Program Improvement | 0.5 | 1 |
| Specialized Facilities | Please describe any specialized facilities, equipment, technology, and/or materials available to program participants. Please provide any relevant website links or documentation. | Response Provided | Facilities, Equipment, Technology and Materials | 1 | 1 |
| Staff PD | Do program staff have opportunities to participate in professional learning activities specific to advanced manufacturing? | Yes | Prepared and Effective Program Staff | 1 | 1 |
| Sequenced Courses | Does the program structure require students to take courses in a SEQUENCE (e.g., Advanced Manufacturing Technology I, Advanced Manufacturing Technology II, Advanced Manufacturing Technology III, etc.)? | Yes | Sequencing and Articulation | 0.3333333333 | 1 |

| Category Name | Full Question | Response Required to Receive Point | Related High-quality CTE Program Element | Element-Weighted Score | Non-Weighted Score |
|---|---|---|---|---|---|
| Credentials | Which of the following industry-recognized credentials does your program offer? | At least 1 selected | Sequencing and Articulation | 0.3333333333 | 1 |
| Credit that Articulates | Which of the following opportunities to earn credit that articulates to the next level of education does your program offer? | At least 1 selected | Sequencing and Articulation | 0.3333333333 | 1 |
| Industry-Recognized Standards & Competencies | Does your program's curriculum incorporate industry-recognized technical standards and competencies (e.g., NIMS, AWS, MSSC, etc.)? | Yes | Standards-aligned and Integrated Curriculum | 0.25 | 1 |
| Employability Skill Standards | Does your program's curriculum incorporate employability skill standards, such as problem solving, critical thinking, teamwork, communications, interview skills, and workplace etiquette, that help students succeed in the workplace? | Yes | Standards-aligned and Integrated Curriculum | 0.25 | 1 |
| Publicly Available Standards | Are program standards publicly available and accessible? | Yes | Standards-aligned and Integrated Curriculum | 0.25 | 1 |
| Curriculum Reviewed Regularly | Is the program's curriculum reviewed regularly? | Yes | Standards-aligned and Integrated Curriculum | 0.25 | 1 |

| Category Name | Full Question | Response Required to Receive Point | Related High-quality CTE Program Element | Element-Weighted Score | Non-Weighted Score |
|---|---|---|---|---|---|
| Career Development | Which of the following career development opportunities does your program offer? | At least 1 selected | Student Career Development | 1 | 1 |
| Work-based Learning | Which of the following work-based learning opportunities does your program offer? | At least 1 selected | Work-based Learning | 1 | 1 |
| | | | **Total Possible Score:** | **10** | **19** |