Connecticut Center for Advanced Technology, Inc.

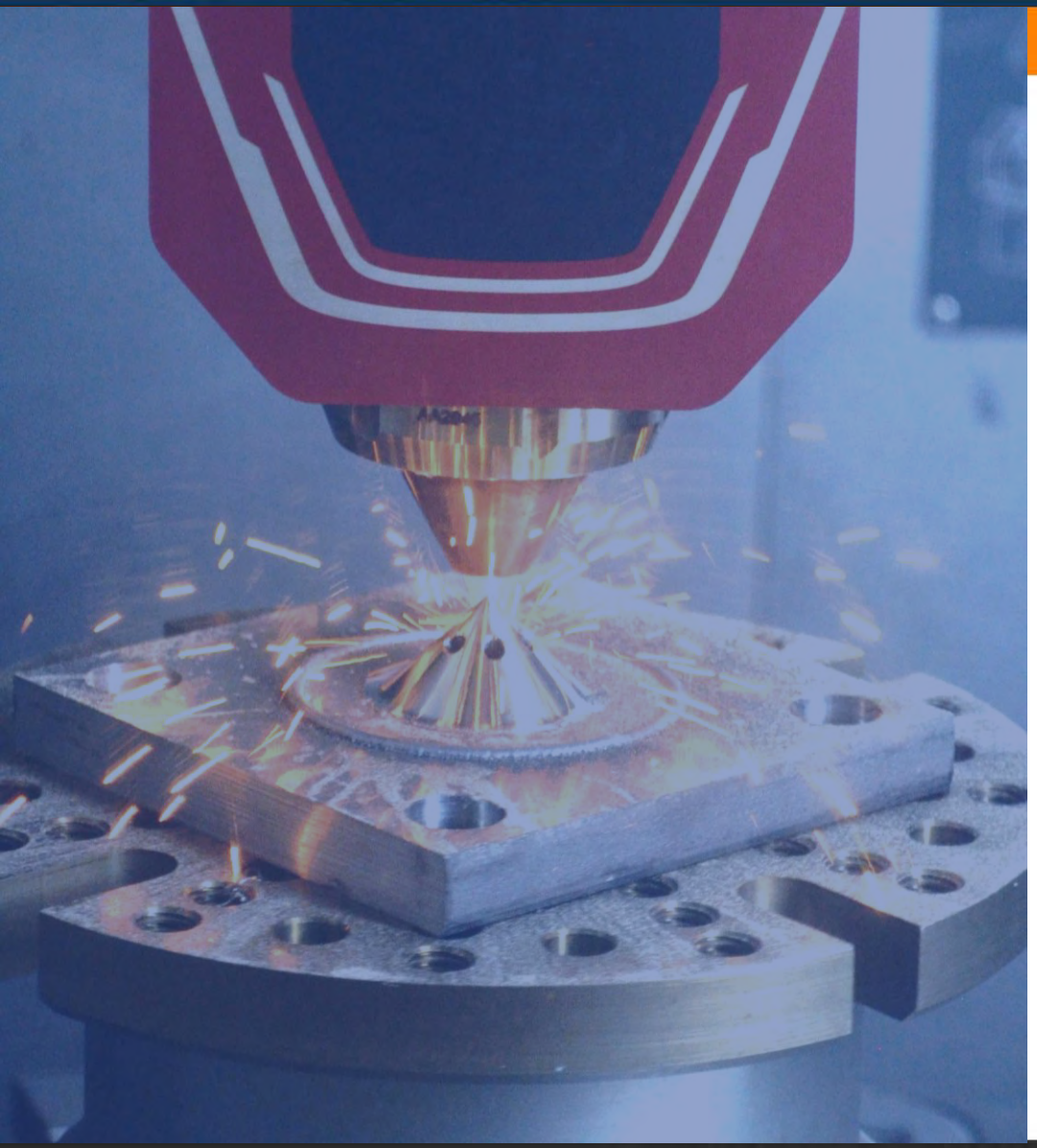
Debunking the Mysteries of Women in Modern Manufacturing & Our Workforce Challenges

Tue. Oct. 26, 2021

CSDE
CONNECTICUT STATE DEPARTMENT OF EDUCATION

TODAY'S SKILLS
TOMORROW'S CAREERS

MANUFACTURE 4.0
Creating Tomorrow's Industrial Revolution Today



Agenda

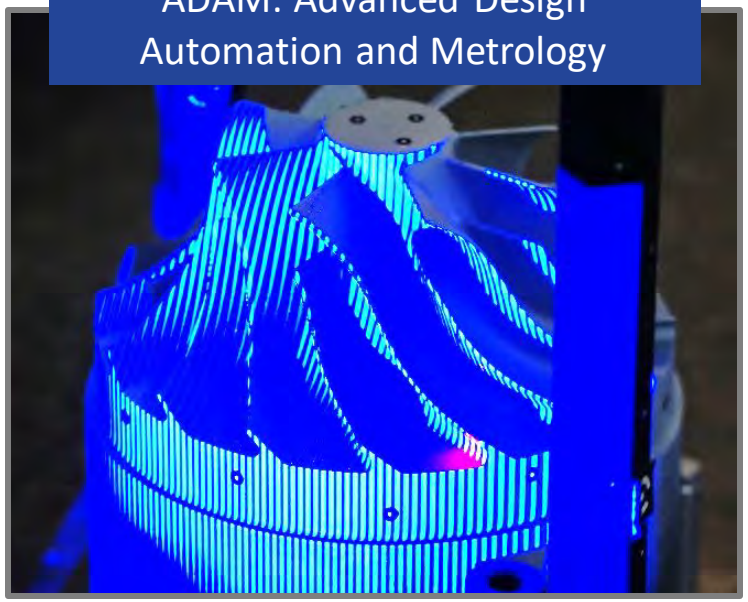
- Who is CCAT?
- What are the workforce challenges in CT and how can we advocate for careers in manufacturing and STEM?
- How can we encourage/advocate to stakeholders to consider this dynamic industry?
- What are some best practices on engaging stakeholders to gain exposure and be inspired?
- What are some key take-aways and how can CCAT support your efforts?

CCAT is your Resource

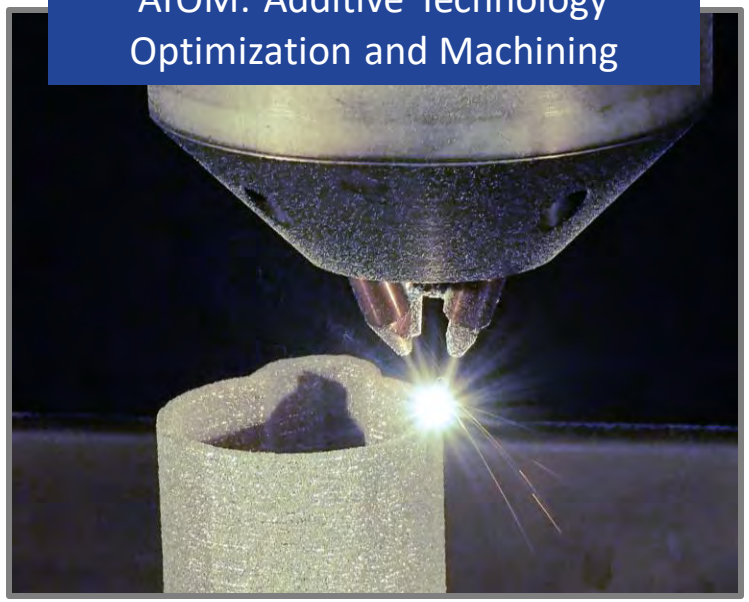
CCAT is an applied technology development, demonstration and training center that **innovates, validates**, **demonstrates**, and **assists with the adoption** of **leading-edge technologies** into Connecticut and the nation's **advanced manufacturing supply chain**, while providing vital **workforce training and upskilling** necessary to fully-utilize the technology advancement.

ADVANCED TECHNOLOGY CENTERS

ADAM: Advanced Design Automation and Metrology

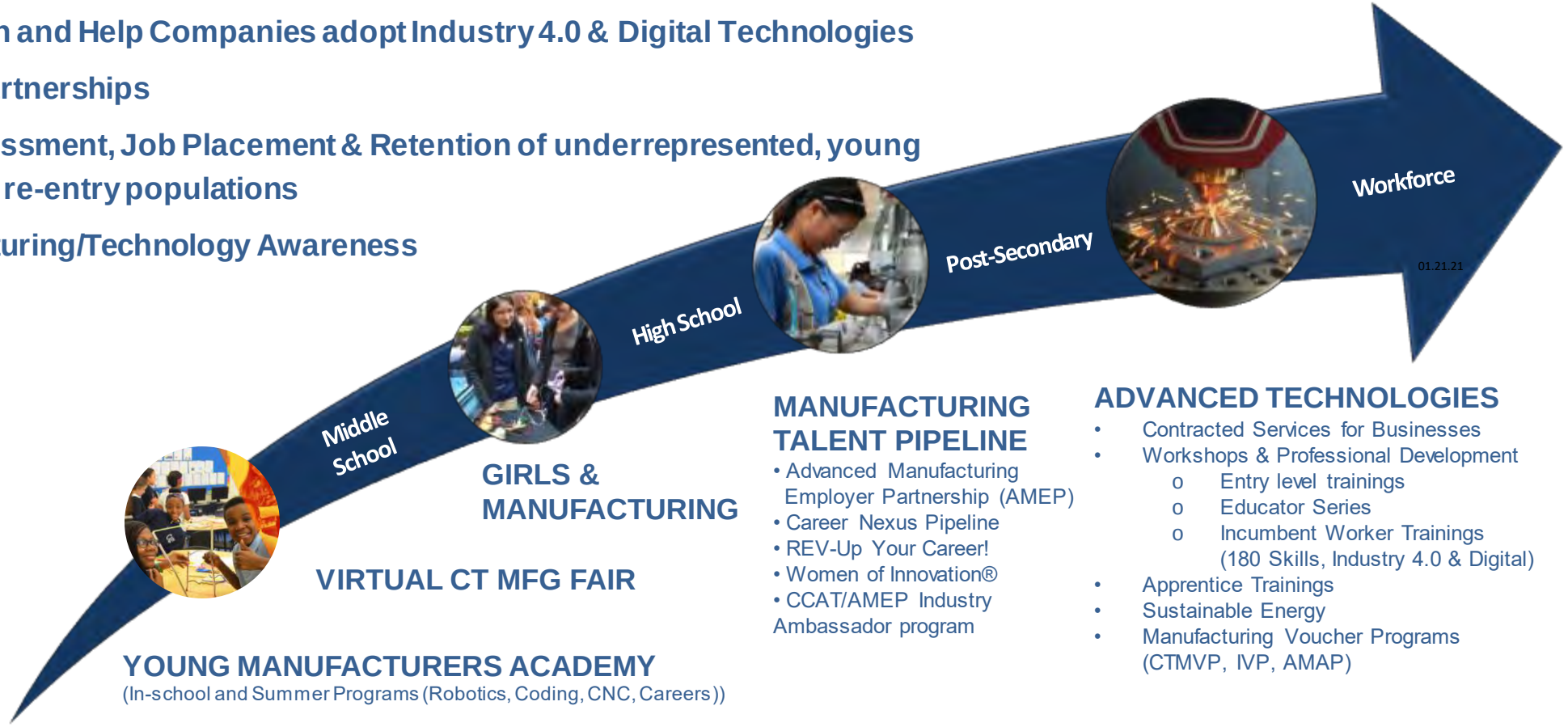


ATOM: Additive Technology Optimization and Machining



Advanced Composite Technology Center

- **Demonstrate, Train and Help Companies adopt Industry 4.0 & Digital Technologies**
- **Foster Industry Partnerships**
- **Recruitment, Assessment, Job Placement & Retention of underrepresented, young adults, Two-Gen & re-entry populations**
- **Increase Manufacturing/Technology Awareness**



YOUNG MANUFACTURERS ACADEMY

(In-school and Summer Programs (Robotics, Coding, CNC, Careers))

VIRTUAL CT MFG FAIR

GIRLS & MANUFACTURING

MANUFACTURING TALENT PIPELINE

- Advanced Manufacturing Employer Partnership (AMEP)
- Career Nexus Pipeline
- REV-Up Your Career!
- Women of Innovation®
- CCAT/AMEP Industry Ambassador program

ADVANCED TECHNOLOGIES

- Contracted Services for Businesses
- Workshops & Professional Development
  - Entry level trainings
  - Educator Series
  - Incumbent Worker Trainings (180 Skills, Industry 4.0 & Digital)
- Apprentice Trainings
- Sustainable Energy
- Manufacturing Voucher Programs (CTMVP, IVP, AMAP)

Funding has been provided by CT Department of Economic and Community Development's Manufacturing Innovation Fund, Connecticut State Board of Education (CSBE); Workforce Solutions Collaborative of Metro Hartford, CT Health and Education Facilities Authority (CHEFA), and Capital Workforce Partners (CWP).

Millie Hemming

Education & Workforce Specialist
2 years @ CCAT

B.S. Psychology/Spanish, SCSU
M.S. School Counseling, Cappella University

Kristi Oki

Mechanical Engineer
Advanced Design, Automation & Metrology | 4 years @ CCAT

B.S. Mechanical Engineering Sciences, Yale; M.S. Mechanical Engineering, MIT

Present US Workforce Challenges

https://unsplash.com/photos/k9Dc5zT1Gq0

In the next 10 years,
4.6 million U.S. jobs will be open in advanced manufacturing…

But only 2.2 million jobs will be filled!

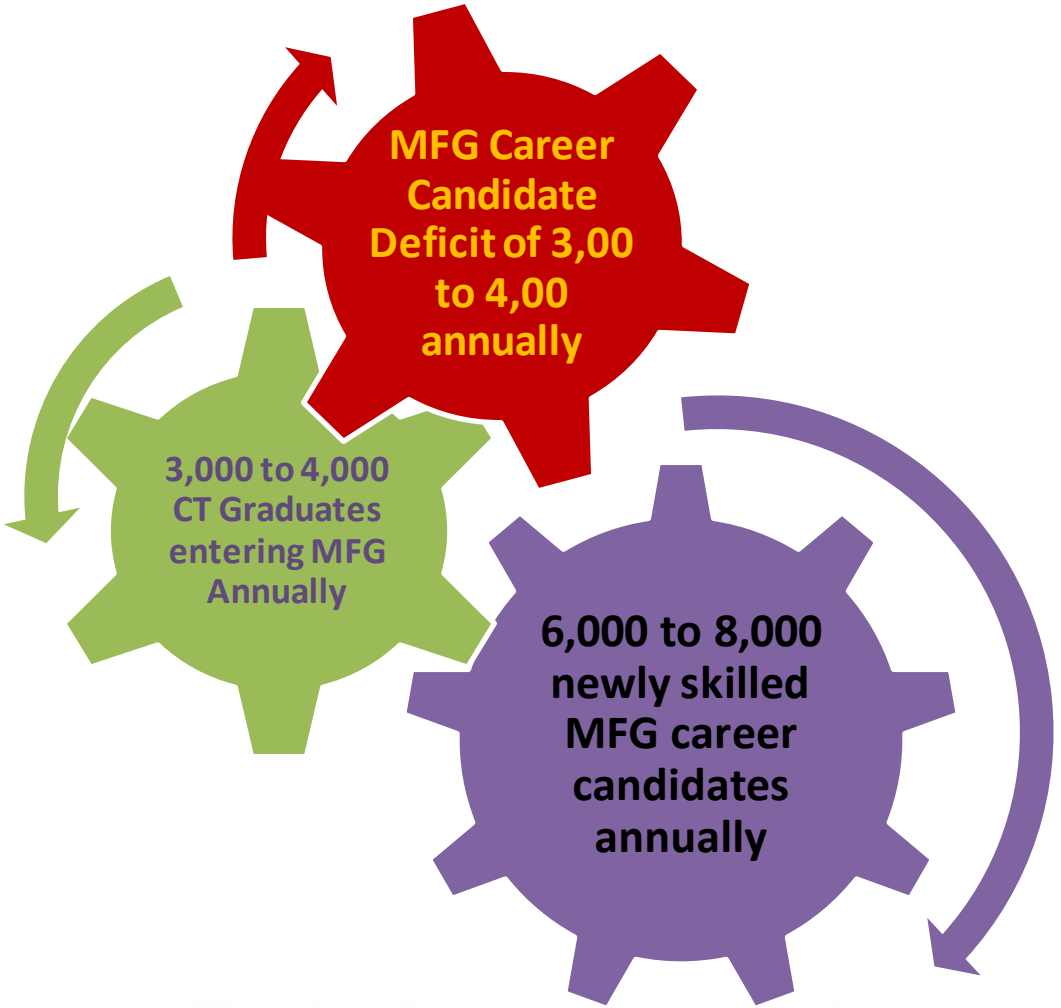
We have career opportunities flowing from STEM education which need to be shared.

National Association of Manufacturers Manufacturing Institute, 2019

CT's Chief Manufacturing Officer: Colin Cooper

CT Workforce Challenges

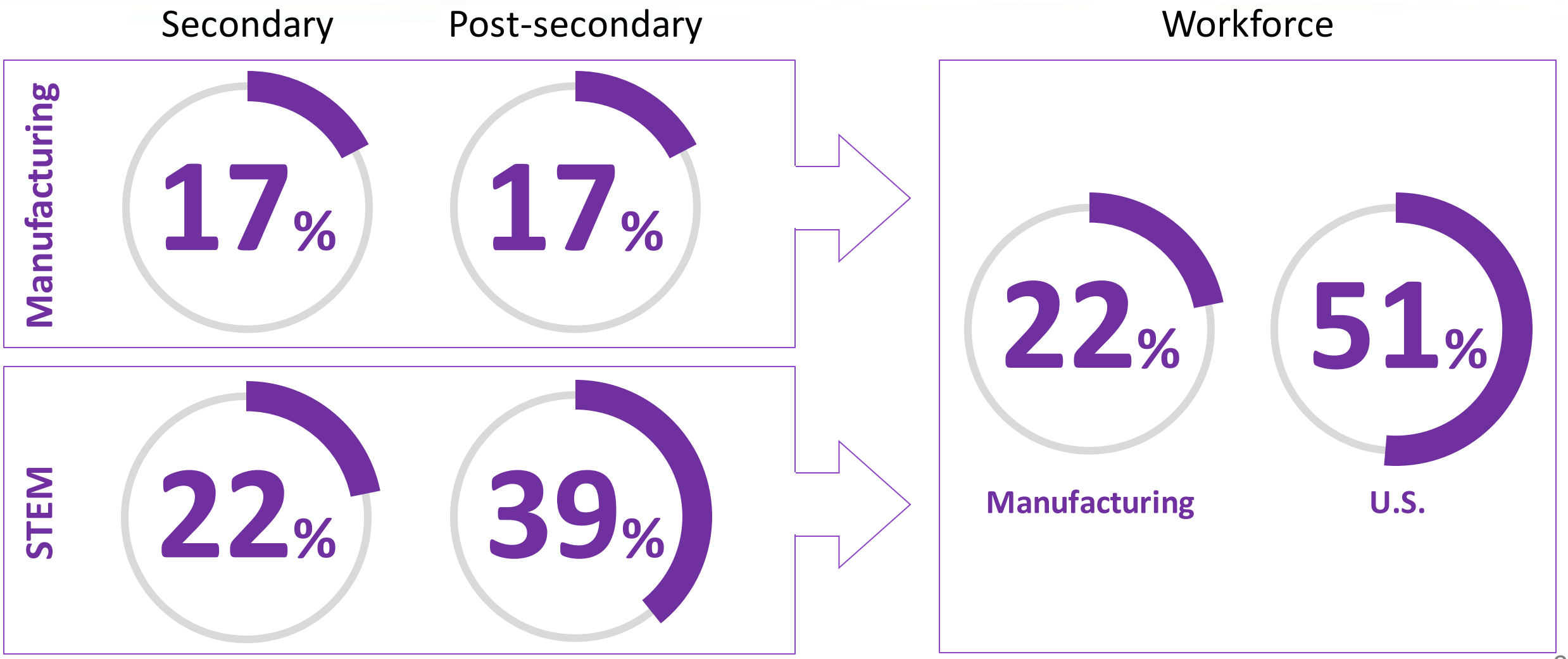
- **Technical high schools**
- **HS Manufacturing Programs**
- **Apprentices**
- **State Colleges & Universities**
- **Private institutions**
- **Workforce programs**



9,000 CT HS graduates do not go on to college or the military annually

- 35 % of MFG Workforce is 55+
- Jan 20218,00 to 10,00 open positions

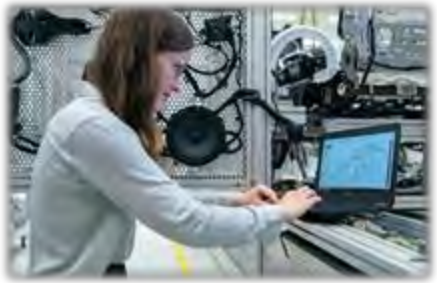
2020 Connecticut Female Enrollment



The 2020 Perkins Consolidated Annual Report (CAR), student enrollment was provided by career cluster.

Advocacy & Awareness are Key





MANUFACTURING IN CONNECTICUT:

WE MAKE GREAT STUFF!



Stakeholder Messaging: Modern Manufacturing is…

Clean & safe

Rewarding

Technical

Innovative & creative

High paying

Connecticut Center for Advanced Technology, Inc.

Diverse Industry Sectors

Chemicals

Photo by Crystal Kwok on Unsplash

Sustainable Energy

Photo by Nicholas Doherty on Unsplash

Plastics

Photo by Wepco Plastics

Food & Beverage

Photo by Monique Carrati on Unsplash

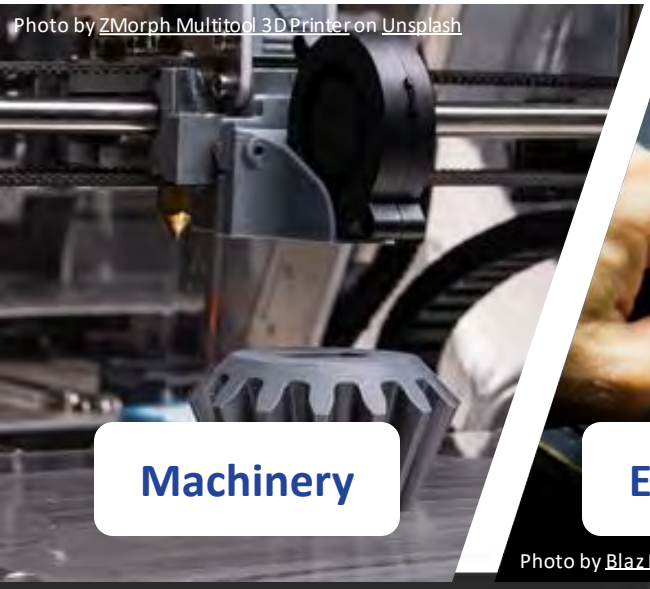
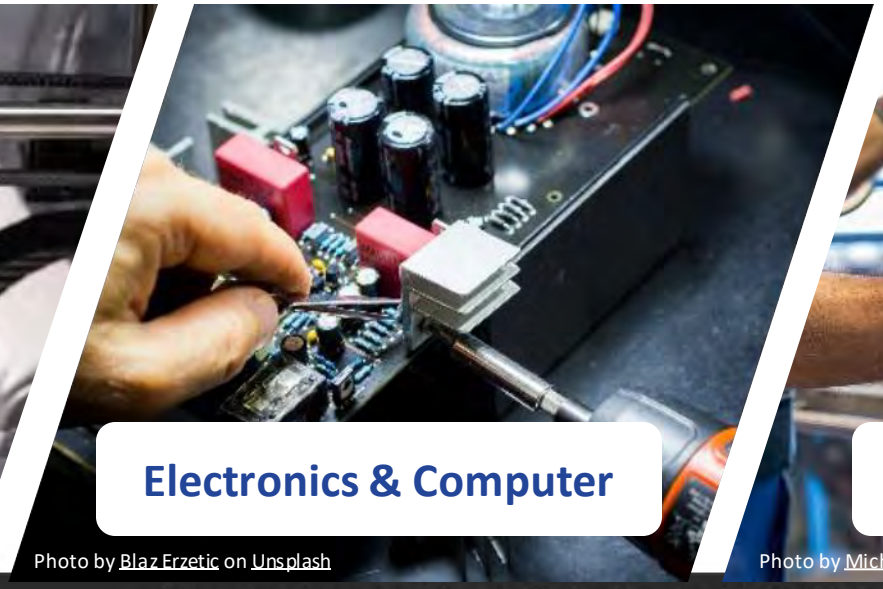


Photo by ZMorph Multitool 3D Printer on Unsplash

Machinery



Electronics & Computer

Photo by Blaz Erzetic on Unsplash

Metals & Finishing

Photo by Michal Jarmoluk from Pixabay

Aerospace & Transportation

Photo by Kelly Lacy from Pexels

Interests/Hobbies = Transferrable Skills

- Attention to detail
- Mechanical Aptitude
- Observation / Research
- Creativity / Design
- Teamwork / Social Skills
- Problem Solving / Critical Thinking
- Project Management
- Customer Service

Career Areas of Advanced Manufacturing

Connecticut Center for Advanced Technology, Inc.

OPERATIONS

Logistics Specialists
$38.20 average CT wage
$25.88 entry level wage

CNC Programmers
$32.24 average CT wage
$21.02 entry level wage

Machine Operators
$24.85 average CT wage
$17.10 entry level wage

Assemblers
$16.75 average CT wage
$12.08 entry level wage

Welders
$26.02 average CT wage
$16.79 entry level wage

Metal Fabricators
$19.81 average CT wage
$14.40 entry level wage

Connecticut Center for Advanced Technology, Inc.

TECHNICAL SUPPORT

Mechanical Drafters
$32.58 average CT wage
$21.55 entry level wage

Computer Support Specialists
$36.05 average CT wage
$23.10 entry level wage

Mechanical Engineers
$46.11 average CT wage
$31.90 entry level wage

Lab Technicians
$20.05 average CT wage
$13.77 entry level wage

Maintenance Mechanics
$29.87 average CT wage
$20.46 entry level wage

Connecticut Center for Advanced Technology, Inc.

QUALITY ASSURANCE

Quality Engineers
$51.07 average CT wage
$32.14 entry level wage

Quality Control Technicians
$32.10 average CT wage
$21.84 entry level wage

Quality Control Inspectors
$25.20 average CT wage
$15.57 entry level wage

CMM Operators (Coordinate Measuring Machine)
$22.77 average CT wage
$19.00 entry level wage

Connecticut Center for Advanced Technology, Inc.

BUSINESS SUPPORT

Salespeople
$36.22 average CT wage
$18.95 entry level wage

Office Staff/Customer Service
$22.98 average CT wage
$13.04 entry level wage

Managers
$62.64 average CT wage
$36.23 entry level wage

Accounting & Purchasing Specialists
$41.60 average CT wage
$27.09 entry level wage

Careers in Problem Solving

I enjoy **investigating** problems by using my **analytical skills,** researching, and working with data.

→ Manufacturing engineer

I enjoy using my **imagination** to create new things. I like to express my creations through art, writing & use of technology.

→ Materials analyst, engineer, welder, CAD drafter.

I enjoy working with machines and tools.

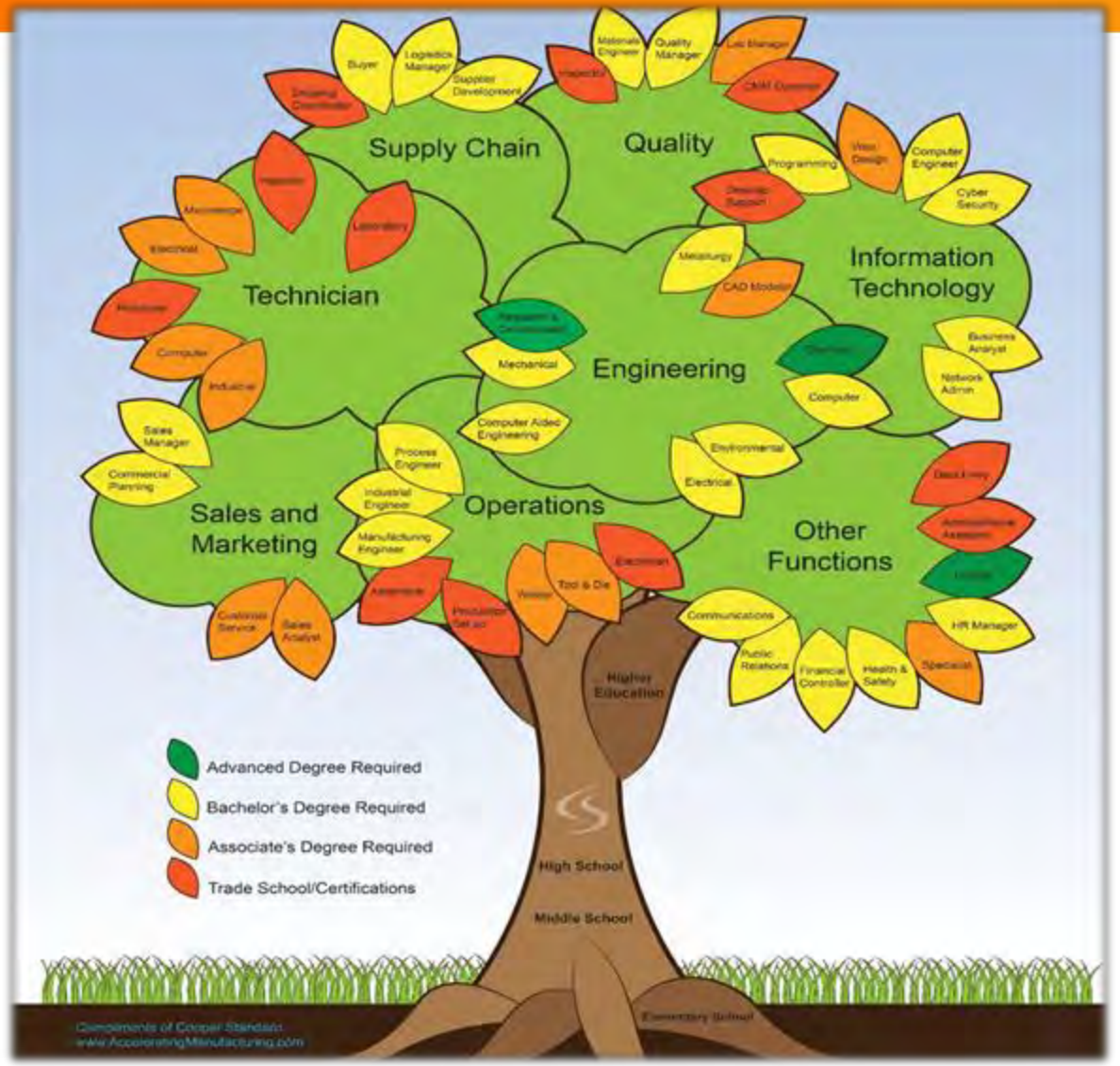
→ Manufacturing engineer, CNC machine operator, precision grinder, hydraulic technician.

People, Products & Information Management Careers

I enjoy working with people to solve problems with products.	→	Quality control inspector, Quality inspector, logistics specialist.
I enjoy leading and managing people in groups and teams.	→	Manufacturing plant manager, supervisor, product design lead, etc.
I enjoy working with information and finances.	→	Accounting, Information Technology (IT)

Connecticut Center for Advanced Technology, Inc.

Education and Training Options



Advocacy, Awareness, Engagement

What concrete steps can we take as
educators, workforce professionals, training specialists and
community advocates to

- attract
- advocate
- advance

females and those underrepresented in manufacturing to
positively impact the manufacturing workforce of the future?

STEM & Manufacturing Connections for Educators

1

Reach girls early.

Fourth grade is around the time where girls' confidence starts to waver, the efficacy begins to change and doubt creeps in, Hudgins said. A 2018 survey by YPulse found girls' confidence drops 30% between the ages of 8 and 14. That decline begins at a crucial time for coursework decision-making. In fifth grade students begin planning their middle school classes, which will determine the courses they're able to take in high school. Educators can place girls in coed groups so they'll learn to be assertive in realistic scenarios.

2

Show that STEM is everywhere.

Incorporate hands-on, inquiry-based STEM lessons that connect to the real world.

3

Prompt continuous learning.

Seek out free STEM education materials on the internet, and encourage students to pursue extracurricular STEM activities, such as after-school clubs, summer camps or community service activities that incorporate STEM learning.

4

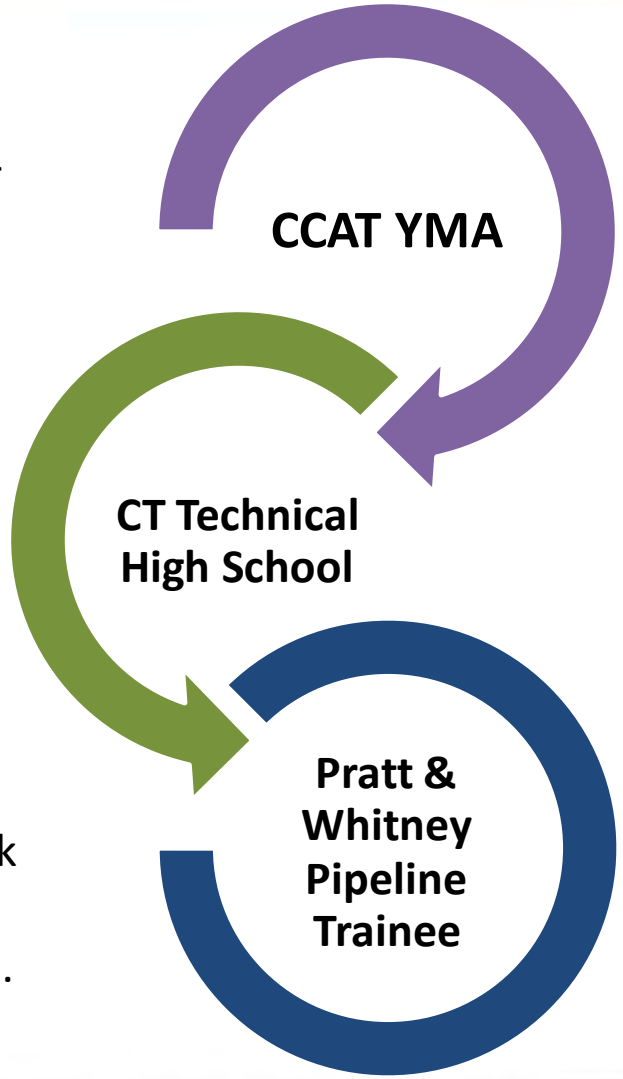
Build networks.

Connect girls to female support networks and influencers, including mothers and working role models. Supportive male mentors are also helpful.

[Recruiting More Women Engineers | Getting Girls Involved in STEM (syracuse.edu)]

Career Candidate Story: CCAT, CTE, Career Pathway

Early exposure to CCAT Young Manufacturer's Academy Summer Programming



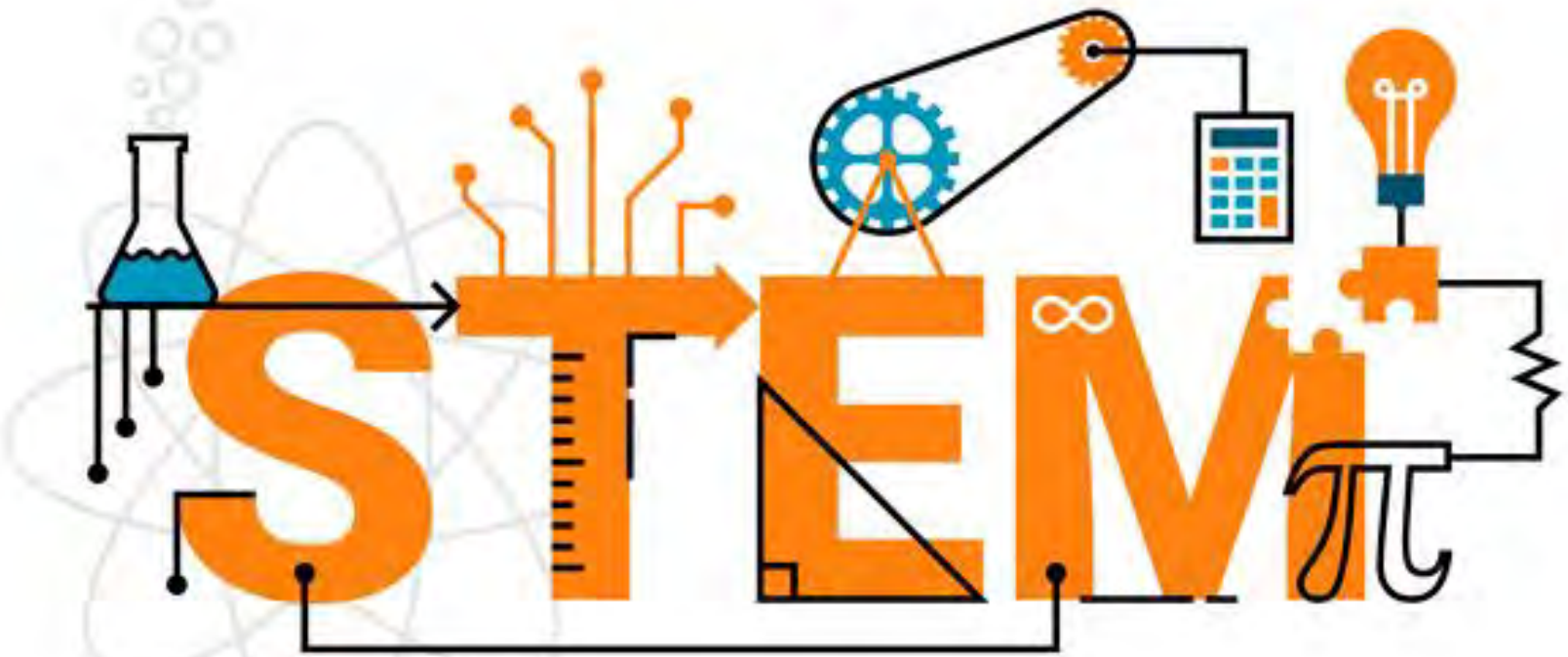
Selection of CT High School (Platt) along with Manufacturing trade concentration. June 2021 graduate.

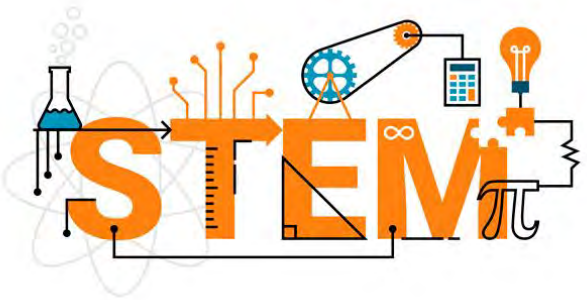
Application and pre-qualification process by CCAT to Pratt & Whitney Pipeline Program 2021. Candidate selected. 7-week paid training at Asnuntuck Community College with hiring letter upon completion. $30+ an hour wage!

Meet CT Companies: Barnes Aerospace

CTcreates.org

Connecting STEM with Manufacturing





- Robotics
- Programming
- Materials Science
- 3D Printing
- Artificial Intelligence
- Augmented Reality
- Data Analytics
- Engineering Design

Modern Manufacturing

…and more!

Recommended Strategies

- ❑ Working on real-world STEM issues/problems
- ❑ Interacting with someone who works in STEM areas
- ❑ Learning about STEM careers
- ❑ Interacting with a STEM role models
- ❑ Designing and carrying out my own STEM project

CTE/MFG Professional Learning Community

Fall of 2021: A group of six districts meet to develop and implement strategies to attract and retain females and those from communities currently underrepresented in manufacturing and technology industries. Members meet regularly, share expertise, and work collaboratively in order to positively impact engagement and academic advancement of all students in STEM and manufacturing clusters.

Examples of PLC Program Activities through June 2022:

- District self-reflection on attraction, advocacy, completion
- Alignment of student benchmarks to workforce needs
- Suggestions for best-practice strategies to improve high school outcomes
- Participation in workshops on best practices
- Connections with Industry Ambassador programs and stakeholders

Career Candidate Story: Post-secondary Career Pathway

Post-secondary classes – no focus/major. Personal/family challenges. Certification as flagger: challenges to females on job site, low wage per hour

Connected with CCAT via Training & Education Tool (HOYC). Referred/ enrolled in pre-apprentice manufacturing training. Successful completion of Tooling U (SME). Job readiness assistance and career coaching.

Employment in Hartford area manufacturer with successful training completion.

Wage increase from ($12) to ($17).

Career coaching to identify continue post-secondary options for continued growth.

Barriers addressed to Employment/Training: Affordable housing, COVID impacted services, auto accident, food insecurity, auto insurance, justice involved

Pratt & Whitney Pipeline Post-secondary Career Pathway

2019 Graduates of the Pratt & Whitney sponsored pipeline administered by CCAT with training by Asnuntuck Community College

2021 15 Candidates engaged in training at Asnuntuck Community College

- Recruitment: lense of DEI
- Pre-qualifications and career readiness
- Transition to training process
- Addressing barriers to success

Industry Responds: AMEP

The Advanced Manufacturing Employer Partnership (AMEP) is an *employer-led industry partnership* focused on the workforce needs of manufacturing companies statewide.

Vision: Every manufacturing position is filled with a qualified employee.
Composition: AMEP comprises three employer-led working groups:

- Career Pathways
- Business Development
- Job Quality

AMEP collaborates and aligns with a network of employers, educators, community organizations, CT state government and municipalities, and economic development agencies in an effort to consolidate resources and streamline processes.

Charles Daniels, AMEP Chair, Chief Financial Officer, Wepco Plastics

The 2020 Perkins Consolidated Annual Report (CAR), student enrollment was provided by career cluster.

Resources Available

Manufacturing Cluster and Pathways Resources

- Today's Skills, Tomorrow's Careers: Career Clusters, Career Pathways, Sample Occupations, and Programs of Study (ct.gov)
- Introducing Students to Manufacturing: Best Practices Guide and Program Resources

CSDE Professional Learning

- Career Readiness PD Playlist
- Apprenticeship Career Path PD Playlist
- Career Exploration PD Playlist

Resources Available

CTcreates.org

Manufacturing Resources for students, parents and educators

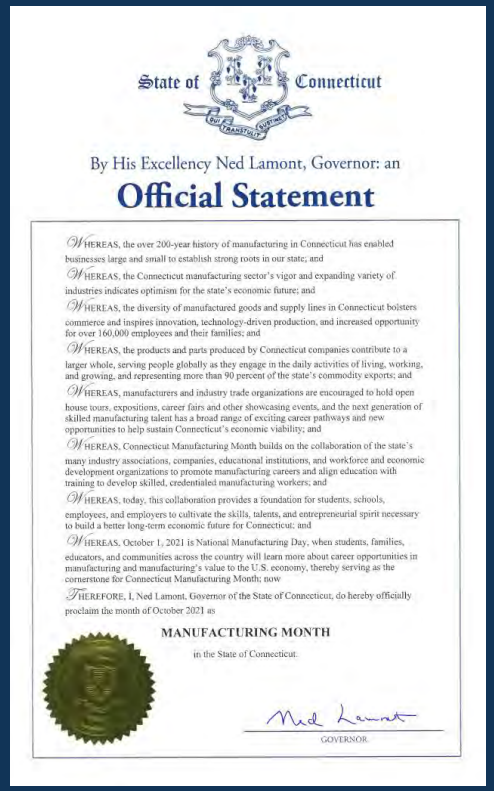
- Meet CT MFG Companies videos – more are being added
- Interactive Activities & Games
- Links to resources about Increasing Females in Manufacturing & STEM

Videos

Educator Resources

Resources Available

CTcreates.org



State of Connecticut

By His Excellency Ned Lamont, Governor: an

Official Statement

WHEREAS, the over 200-year history of manufacturing in Connecticut has enabled businesses large and small to establish strong roots in our state; and

WHEREAS, the Connecticut manufacturing sector's vigor and expanding variety of industries indicates optimism for the state's economic future; and

WHEREAS, the diversity of manufactured goods and supply lines in Connecticut bolsters commerce and inspires innovation, technology-driven production, and increased opportunity for over 160,000 employees and their families; and

WHEREAS, the products and parts produced by Connecticut companies contribute to a larger whole, serving people globally as they engage in the daily activities of living, working, and growing, and representing more than 90 percent of the state's commodity exports; and

WHEREAS, manufacturers and industry trade organizations are encouraged to hold open house tours, expositions, career fairs and other showcasing events, and the next generation of skilled manufacturing talent has a broad range of exciting career pathways and new opportunities to help sustain Connecticut's economic viability; and

WHEREAS, Connecticut Manufacturing Month builds on the collaboration of the state's many industry associations, companies, educational institutions, and workforce and economic development organizations to promote manufacturing careers and align education with training to develop skilled, credentialed manufacturing workers; and

WHEREAS, today, this collaboration provides a foundation for students, schools, employees, and employers to cultivate the skills, talents, and entrepreneurial spirit necessary to build a better long-term economic future for Connecticut; and

WHEREAS, October 1, 2021 is National Manufacturing Day, when students, families, educators, and communities across the country will learn more about career opportunities in manufacturing and manufacturing's value to the U.S. economy, thereby serving as the cornerstone for Connecticut Manufacturing Month; now

THEREFORE, I, Ned Lamont, Governor of the State of Connecticut, do hereby officially proclaim the month of October 2021 as

MANUFACTURING MONTH

in the State of Connecticut.

GOVERNOR

ctmfgmonth.com

Help spread the word using:

#MFGDay21

#CreatorsWanted

#CTMFGMonth

Join this national and statewide celebration

- **Attend an event** – Dozens of virtual and in-person opportunities this Fall
- **Watch short videos** made for CT students to virtually Meet CT MFG Companies
- **Engage and invite** rising young professionals (Industry Ambassadors) to inspire the next generation and raise awareness of career opportunities in modern manufacturing. (CCAT can help!)

Contact: Eileen Candels, ecandels@ccat.us

Connecticut Center for Advanced Technology, Inc.

CT MFG Month Events

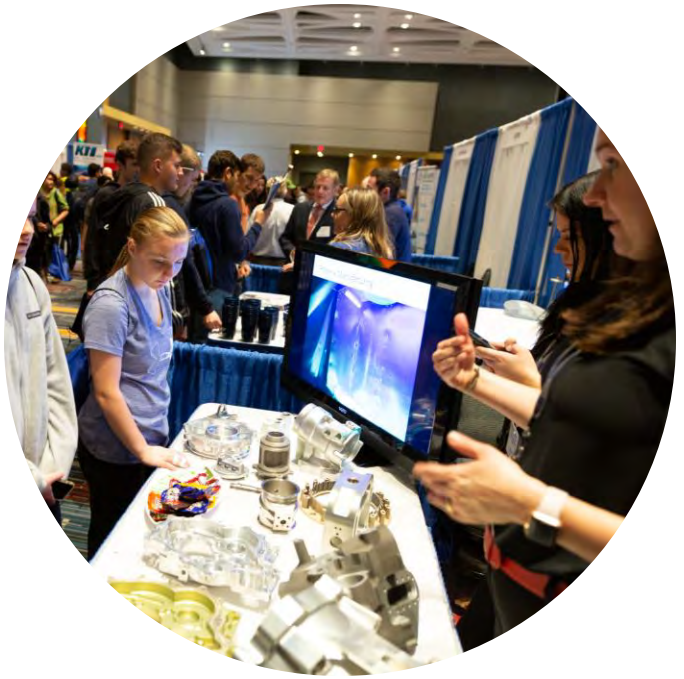
manufacturing mania

ManufaCTuring Mania Community Open House at Goodwin University

Tue. Oct. 26 @ 3:00 - 5:00 pm

ManufaCTuring Mania Community Open House at CCAT

Tue. Nov. 16 @ 4:00 - 6:00 pm



Aerospace Components Manufacturers Workforce Opportunities Fair

Wed. Nov. 10, 8:15 –11:30 am

Register at *ccat.us/events* »

Register at *ctcreates.org/acm*

CT MFG Month Summit for Educators

Educators Workshops & Tours

Tour CCAT's Advanced Technology Center to Inspire ALL Students

Tue. Nov. 30, 9-11 am (In-Person)
Tue. Feb. 15, 1-3 pm (In-Person)

Intro to 3D Printing Technologies for Educators

(On-Demand)

Intro to Manufacturing Careers for Educators

(On-Demand)

Modern Inspection Technologies for Educators

(On-Demand)

Register at *ccat.us/events*

Industry Ambassadors

We can help you set up meaningful connections to recruit and inspire our future workforce.

Contact: Eileen Candels, ecandels@ccat.us

- Industry Ambassadors represent emerging manufacturing employees that are committed, energetic, and driven within operations, technical support, business support, and quality assurance roles.
- Industry Ambassadors showcase experiences in modern CT Manufacturing companies and career journeys to students.
- Based on The Manufacturing Institute's national best practice model, CCAT's Industry Ambassador Program is designed to create greater awareness about careers in manufacturing and technology with a focus on inspiring women and people of color.

Connecticut Center for Advanced Technology, Inc.

K-12 to Professional Women in STEM

Now in its 17th year, the annual Women of Innovation® program recognizes women innovators, role models, and leaders in science and technology, including outstanding young women at the high school and collegiate levels pursuing technology professions. These outstanding women in STEM are the researchers, engineers, entrepreneurs, and business leaders who are developing technologies and discovering breakthroughs that are creating a better future for our state.

Women of Innovation® 2021 is a proud collaboration between the Connecticut Technology Council (CTC) and the Connecticut Center for Advanced Technology, Inc. (CCAT).

Connecticut Technology Council
The Catalyst for Innovation & Growth

View the online celebration from 10/14/2021 at womenofinnovation.org

Connect. Collaborate. Utilize Resources.

What new awareness, questions, or ideas do you have after today's presentation?

What is one resource or take-away that you can easily use to engage students/families/stakeholders?

Questions & Contact

If there are any resources we can provide or any other ways we can help, please feel free to reach out!

Kristi Oki| koki@ccat.us
Millie Hemming| mhemming@ccat.us

Please follow us on

- **LinkedIn @CCAT**
- **Twitter @CCATInc**