PATHWAYS FOR THE FUTURE

EXPERIENCE WORKS

June 28-29, 2023

21st Century Hidden Gems: Career Pathways in Manufacturing

VIRGINIA DEPARTMENT OF EDUCATION

Session Information

- Please put all questions in the Q&A
- Use “speaker view” for the best experience
- Mute your microphone during the session presentation
- All sessions are being recorded
- Complete the survey at the end of the session for PD points – please do not leave the Zoom

PATHWAYS FOR THE FUTURE

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PATHWAYS FOR THE FUTURE

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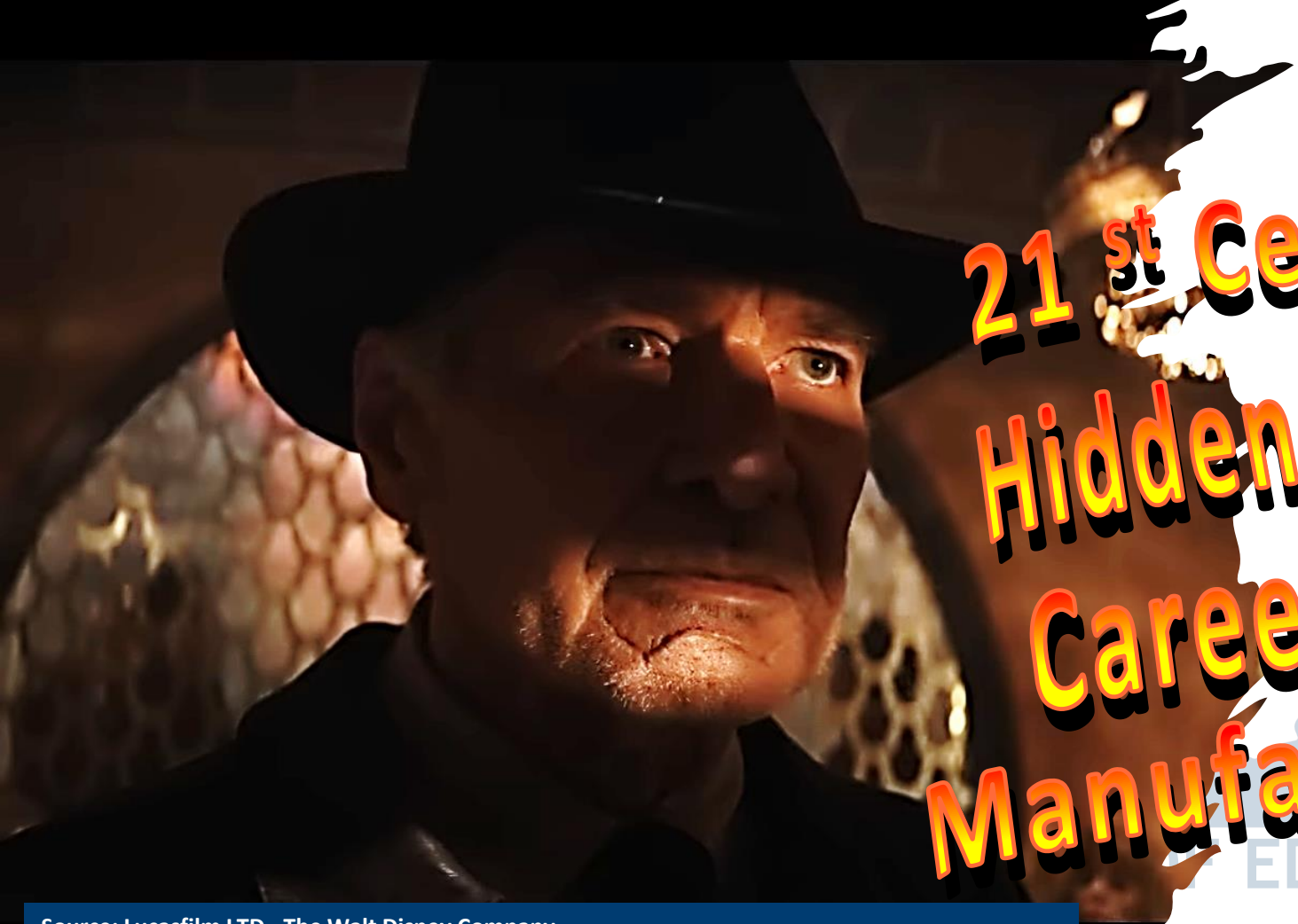


21st Century Hidden Gems: Careers in Manufacturing

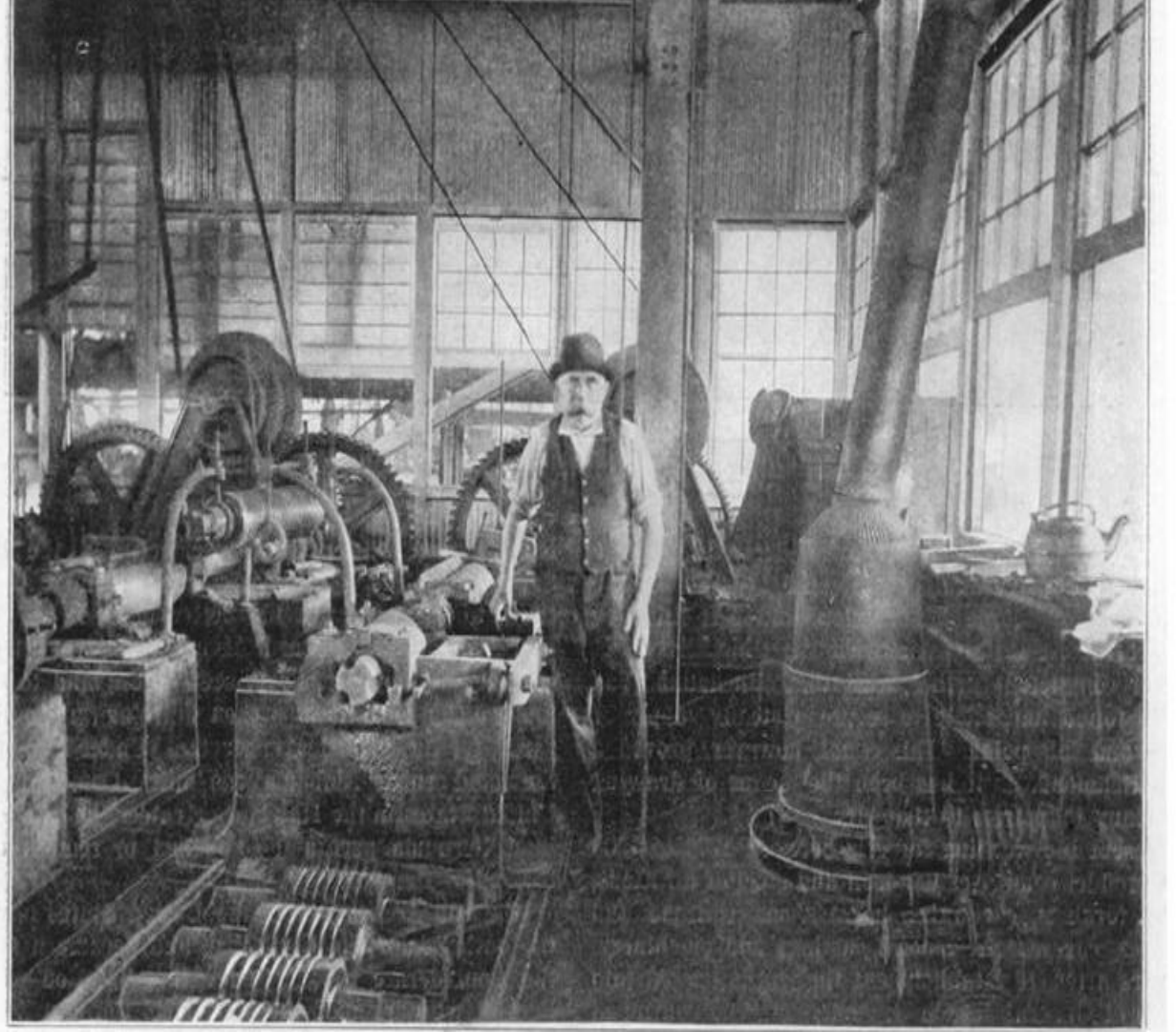
Source: Lucasfilm LTD., The Walt Disney Company

Outline

- Historical perspective
- Industry Opportunities
- Manufacturing Career Pathways
- Educational connections through CTE
- Enablers needed from you

Micron Technology

Many Parents (and by proxy – students) still have this picture of manufacturing in Virginia…



Tredegar Iron Works

Our Part in This History

In Virginia CTE, manufacturing does not fare well against other career clusters that pay lower and have a lower economic multiplier effect

BWX Technologies

Virginia Secondary CTE Enrollment by Career Cluster 2021 – 2022

Career Cluster	Enrollment
Business Management and Administration	41,510
Human Services	33,669
Information Technology	27,834
Science, Technology, Engineering & Mathematics	22,950
Marketing	19,080
Hospitality and Tourism	17,358
Finance	17,020
Agriculture, Food and Natural Resources	15,082
Health Science	10,571
Manufacturing	8,524
Government and Public Administration	8,358
Architecture and Construction	7,845
Arts, Audio-Video & Communications	6,371
Transportation, Distribution and Logistics	4,020
Education and Training	3,707
Law, Public Safety, Corrections and Security	3,072
Energy	74
Total	**247,045**

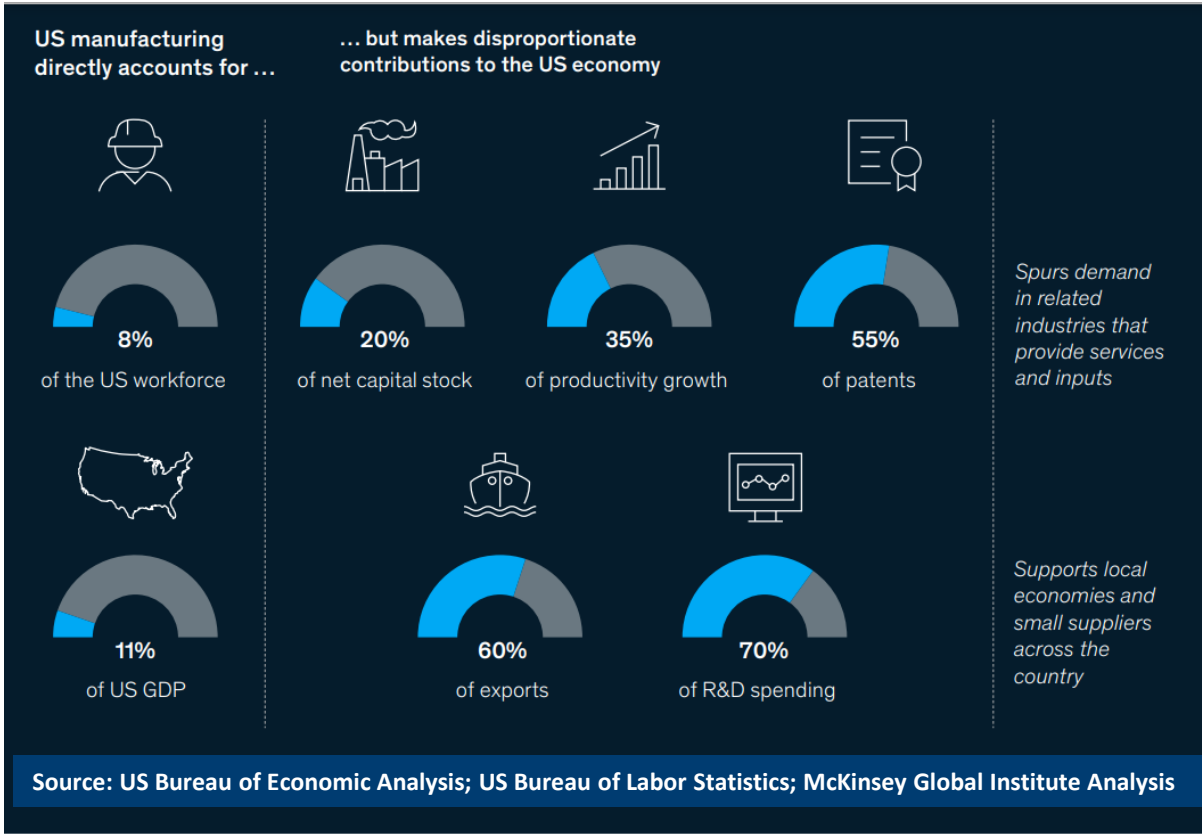
A Strong Manufacturing Economy Unlocks Important Employment and Advancement Opportunities

Delivering the US Manufacturing Renaissance

McKinsey & Company – September 2022

Manufacturing is the main economic engine and primary employer in around 500 US counties today, and in those communities, the industry employs a broader-than-average swath of the overall population and does so more inclusively.

In most cases, employees don't need four-year degrees, and they can earn twice as much as those holding equivalent service-sector jobs, as employers invest in upskilling and reskilling their current workers by offering expanded learning opportunities.



Factory Jobs Are Booming Like It's the 1970s

The New York Times, Sep 26, 2022

Mack Truck, Salem VA

The newly created jobs are more likely to be located in the Mountain West and the Southeast than in the classic industrial strongholds of the Great Lakes.

American manufacturers cut roughly 1.36 million jobs from February to April of 2020, as Covid-19 shut down much of the economy. (By August 2022) manufacturers had added back about 1.43 million jobs, a net gain of 67,000 workers above pre-pandemic levels.

Manufacturing is Changing (I)

More sustainable

- Governments, customers, and investors are demanding a more sustainable approach while also remaining cost-competitive
- Switching to low-carbon sources will be technically and economically challenging, especially for energy intensive heavy-industrial sectors. But the energy transition also offers significant opportunities for US manufacturers
- Demand for new renewable energy generation equipment is set to skyrocket, for example, with capacity expected to increase fourfold by 2050

Huntington Ingalls Industries

More digital

- Leading manufacturers are now applying digital technologies at scale in their operations.
- Around the world, manufacturers are ramping up their investment in key technology areas, seeking to overcome existing pain points in their operations, improve their product and service offerings, or simply keep up with competitors that are more digitally savvy.
- The installed base for the roughly $50 billion advanced robotics industry, for example, is expected to grow 6 percent per year for the next three years at least, as companies take advantage of smarter, more flexible, and more cost-effective equipment to automate more of their activities.
- By 2030, Industry 4.0 applications are expected to account for almost half the total sales of 5G-connected Internet of Things (IoT) devices.

Source: *Delivering the US Manufacturing Renaissance:* McKinsey & Company –

Manufacturing is Changing (II)

More skilled

- Digitization and automation often create new roles faster than workforce training has historically been able to keep up.
- McKinsey research projects that by 2030, the share of physical and manual tasks in the overall economy will have fallen by about 27 percent since 2016, replaced by greatly increased demand for technological and cognitive skills.
- Manufacturing offers high-skill, high-wage jobs for American workers and could do so even more as the industry becomes more digitized and automated.

Huntington Ingalls Industries

More resilient

- For some companies that supply US markets, the evolution of factor costs has significantly eroded the comparative advantage of global production locations and supplier networks.
- When organizations expand their definition of value to take account of sustainability issues and supply chain risks, the gap can narrow even further.

Source: *Delivering the US Manufacturing Renaissance:* McKinsey & Company – September 2022

NEWPORT NEWS PUBLIC SCHOOLS

NNPS CAREER Pathways
EXCITE. EXPLORE. ENGAGE.

Manufacturing

The Manufacturing career cluster prepares learners for careers in planning, managing and performing the processing of materials into intermediate or final products. Careers also include related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

This career cluster is divided into six pathways:

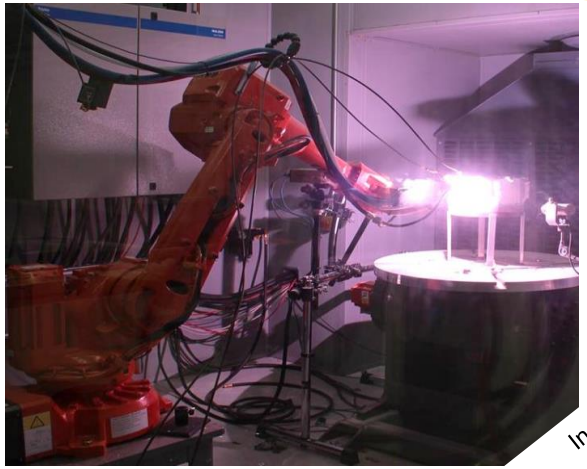
- Production
- Maintenance, Installation and Repair
- Health, Safety & Environmental Assurance
- Logistics Inventory Control
- Manufacturing Production Process Development
- Quality Assurance

Dominion Energy

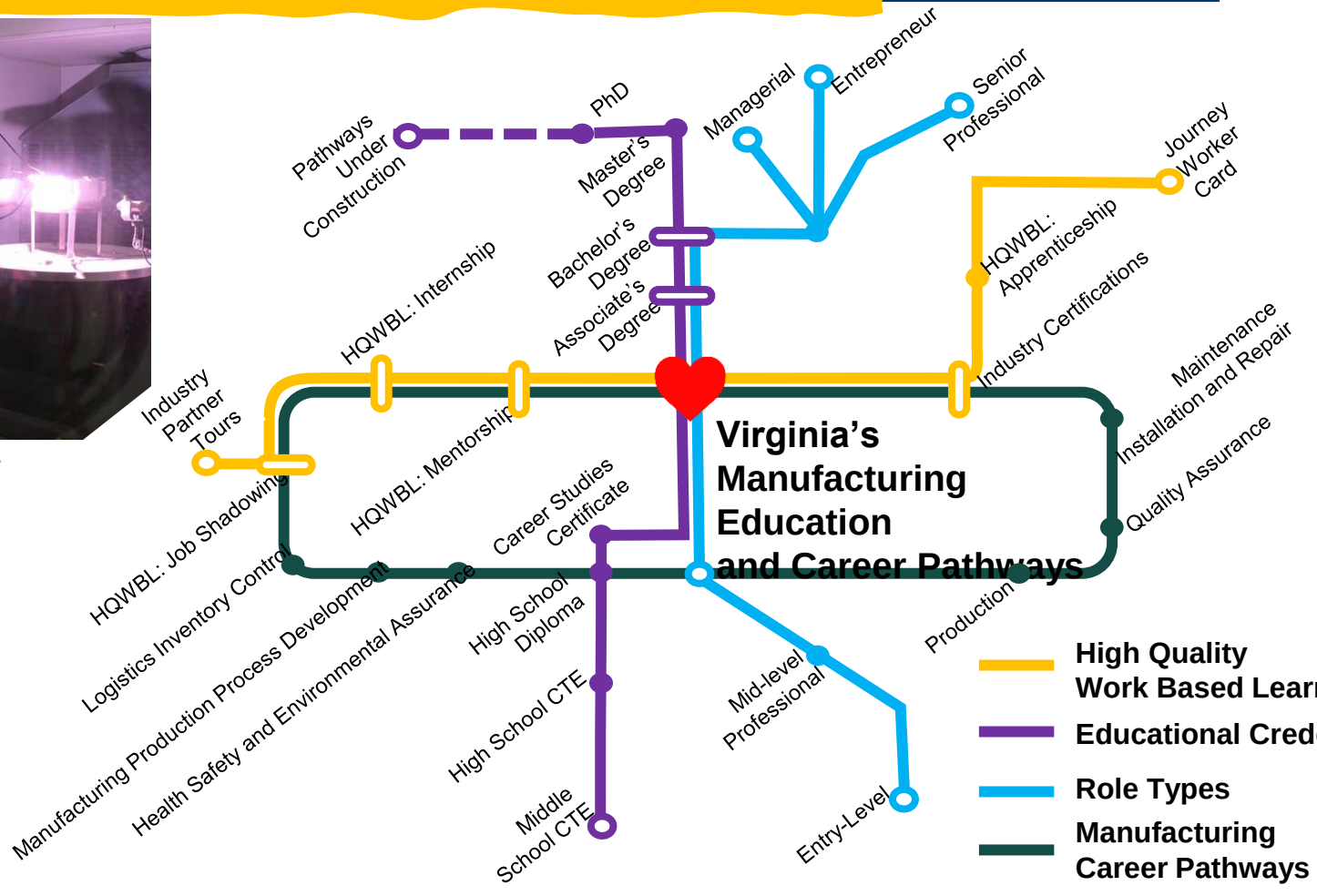
Siemens Gamesa

SOME SCHOOL DIVISIONS ARE ACTIVELY PROMOTING MANUFACTURING CAREER PATHWAYS

MANUFACTURING IS NOT "ONE SIZE FITS ALL"



Commonwealth Center for Advanced Manufacturing



Enablers: Key Success Factors / How to Get Started

CTE Advisory Committees:

- Find manufacturers and Higher-Ed partners in your region to support your CTE and engage in all career planning activities with your faculty, staff, and students
- Lean on them to promote Work Based Learning Opportunities

Higher Education Partners:

- Manufacturing Career Pathways support ALL levels of educational credential attainment
- Virtually all of the great Community College, Junior College, and 4-year Universities across the Commonwealth have programs that will connect students with careers related to manufacturing
- EVERY student has their own path to success, and there are financial incentives to help make dreams a reality

Counselors and Faculty:

- Actively seek out opportunities to expose students AND PARENTS to great career opportunities in your area
- Place the Manufacturing Career Cluster on an equal footing with other clusters

Economic Development:

- The Top 3 priorities for manufacturers seeking to expand are Workforce, Workforce, and Workforce
- Your local / regional EDO always seeks strong connections among secondary, post-secondary, and employers – so engage them as part of your team

VDOE Manufacturing Courses and Certifications

Manufacturing Courses:

Computer Integrated Manufacturing (PLTW)
Cybersecurity in Manufacturing
Industrial Maintenance Technology
Industrial Robotics Technology
Manufacturing Systems
Material and Processes Technology
Mechatronics
Precision Machine Technology
Production Systems
Sheet Metal
Welding

Virginia Department of Education

Contact: Lauren-anne.Sledzinski@doe.virginia.gov

Credentials:

Associate Certified Electronics Technician (CETa)
Business Certificate for Manufacturing
Certified Production Technician (CPT) 4.0
Core: Introduction to Basic Construction Skills
EPA Technician
FANUC Certified Robot Operator with ROBOGUIDE
Festo NC3 Introduction to Mechatronics STEM Lab Certification
Festo NC3 Level 1: Fundamentals Certification
Flux Core Arch Welding (FCAW)
Gas Metal Arc Welding (GMAW)
Gas Tungsten Arc Welding (GTAW)
Industrial Technology Maintenance – Level 1
Manufacturing Specialist Certification
Manufacturing Technician Level 1 (MT1) Certification
Mechatronics Systems Certification
Pre-Manufacturing Technician 1 (Pre-MT1)
Robotics Certification
SENSE Training Program Certification (Level 1, Entry Level Welder)
Shielded Metal Arc Welding (SMAW)
Smart Automation Associate Certifications
Stratasys Additive Manufacturing Certification – Level 1
Welding Level One

How to Reach Me:

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Virginia Intern Day 2022
TOP Employer for Interns

CCAM
SOLVING ADVANCED MANUFACTURING CHALLENGES

VAFAME
CENTRAL VIRGINIA CHAPTER

VSU Virginia State Since 1882
Greater Happens Here
College of Engineering and Technology

PATHWAYS FOR THE FUTURE

QUESTIONS

VIRGINIA DEPARTMENT OF EDUCATION

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Earn Your PD Points!

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