

## CTE: THE KEY TO ECONOMIC DEVELOPMENT

### Manufacturing:

Accounted for

# \$1.87 trillion

in 2012—11.9%  
of U.S. gross  
domestic product



Provides about one  
in six private-sector  
jobs and pays family-  
sustaining wages<sup>1</sup>

What is the pathway to these  
fulfilling and essential careers?

**Career and Technical Education!**



Association for Career and Technical Education  
1410 King Street, Alexandria, VA 22314  
Phone: 800-826-9972 • Fax: 703-683-7424  
[www.acteonline.org](http://www.acteonline.org)  
Connecting Education and Careers

# Advanced Manufacturing

## The growing sub-sector of advanced manufacturing:

- tops the list of key and emerging industries in many states
- uses cutting-edge technology and processes to make products that are high tech, unique, improved and less expensive
- requires high-skilled workers
- will be a major factor in overall production—for instance, the computer and peripheral equipment manufacturing industry is projected to increase output almost fivefold<sup>2</sup>

## What jobs are available in advanced manufacturing?

Despite media attention on manufacturing job losses, many career opportunities exist in this area. Two million job openings in manufacturing are expected through 2018, mostly owing to retirements.<sup>3</sup> In addition, the manufacturing sector has been vulnerable to skills gaps. According to a survey of U.S. manufacturers, 67 percent reported a moderate to severe shortage of talent.<sup>4</sup> In particular, machinists/machine operators and engineers are among the top 10 jobs that U.S. employers have trouble filling.<sup>5</sup>

By 2018, 42 percent of jobs in manufacturing will require some postsecondary education or a degree.<sup>6</sup> Expectations for postsecondary attainment will likely continue to rise, particularly in advanced manufacturing. Advanced manufacturing occupations require academic, employability and technical skills, including skills in quality production processes, maintenance, safety and customer needs. In addition, 12 percent of managerial and professional office jobs are in manufacturing.<sup>7</sup> Advanced manufacturing careers include:

- machinists
- production supervisors
- inspectors
- engineers
- accountants
- business administrators
- computer technicians
- marketing specialists

## How does CTE prepare the advanced manufacturing workforce?

Career and technical education (CTE) prepares high school, postsecondary and adult students for careers in advanced manufacturing through:



## Endnotes

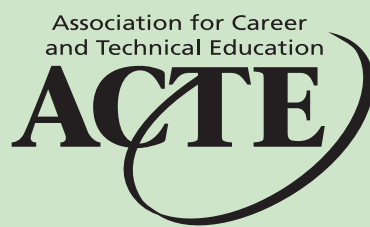
1. National Association of Manufacturers. (n.d.). *Facts About Manufacturing in the United States*. Retrieved from [www.nam.org/Statistics-And-Data/Facts-About-Manufacturing/Landing.aspx](http://www.nam.org/Statistics-And-Data/Facts-About-Manufacturing/Landing.aspx).
  2. Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help Wanted: Projections of Jobs and Education Requirements Through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.
  3. Ibid.
  4. Deloitte and the Manufacturing Institute. (2011). *Boiling Point? The Skills Gap in U.S. Manufacturing*. New York: Deloitte Development LLC.
  5. ManpowerGroup. (2012). *2012 Talent Shortage Survey: Research Results*. Milwaukee: Author.
  6. Carnevale, A. P., Smith, N., Stone III, J. R., Kotamraju, P., Steuernagel, B., & Green, K. A. (2011). *Career Clusters: Forecasting Demand for High School Through College Jobs*. Washington, DC: Georgetown University Center on Education and the Workforce.
  7. Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help Wanted: Projections of Jobs and Education Requirements Through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce.
  8. Greater Waco Advanced Manufacturing Academy. (n.d.). "Greater Waco Advanced Manufacturing Academy." Retrieved from [www.gwama.org](http://www.gwama.org); Waco Independent School District. (n.d.). "Greater Waco Advanced Manufacturing Academy." Retrieved from [www.wacoisd.org/cms/One.aspx?portalId=428&pageId=35000](http://www.wacoisd.org/cms/One.aspx?portalId=428&pageId=35000).
  9. Workforce Buzz. (April 8, 2013). *Member Spotlight: Finger Lakes Community College (CC) Advanced Manufacturing Machinist Training Program*. Albany, NY: New York Association of Training and Employment Professionals; additional information from FLCC staff.
  10. Right Skills Now. (n.d.). "About." Retrieved from [www.rightskillsnow.org/about](http://www.rightskillsnow.org/about); Right Skills Now. (n.d.). "Statement of Principles."
- the national Career Clusters® Framework, including Career Clusters and pathways in manufacturing, STEM, business management and administration, and marketing, among other fields, which outlines course progressions that help students explore career options and prepare for college and career success
  - CTE courses in production systems, robotics, computer-integrated manufacturing, machining, welding, plastic processing, and logistics and inventory control, all integrated with rigorous academics
  - work-based learning experiences, such as Cardinal Manufacturing, a manufacturing business operated by high school students in Wisconsin, as well as apprenticeships, mentorships and internships on-site at manufacturing facilities
  - career and technical student organization enrichment experiences, such as SkillsUSA competitions in automated manufacturing technology
  - opportunities to earn certificates, degrees and industry-recognized certifications, such as the stackable credentials available under the National Association of Manufacturers (NAM)-endorsed Manufacturing Skills Certification System

## What are promising programs in advanced manufacturing?

The **Greater Waco Advanced Manufacturing Academy (GWAMA)** in Texas opens fall 2013 with 11th- and 12th-graders interested in intensively exploring the fields of welding and precision metal manufacturing. GWAMA will provide students with rigorous manufacturing classes and an enrichment/professional development day each week. Students will acquire skills in manufacturing productions operations and facilities maintenance and have the opportunity to intern with local business partners. In addition, they will graduate with dual-credit college hours transferrable to Texas State Technical College and, if they enter the workforce, can expect starting wages of \$13/hour. The academy is supported by many local manufacturing businesses that offer curriculum support, mentorships, internships and equipment.<sup>8</sup>

The six-month **Advanced Manufacturing Machinist Training Program** at Finger Lakes Community College (FLCC) in New York was developed in conjunction with G.W. Lisk, a local manufacturer, and includes 150 hours of classroom instruction and 350 hours of hands-on experience at the G.W. Lisk facility, mentored by trainers from FLCC and G.W. Lisk. The program has gotten off to a successful start—all students in the graduating classes of 2011 and 2012 were employed or had job offers at graduation. For G.W. Lisk, the benefits include gaining and retaining qualified workers.<sup>9</sup>

The **Right Skills Now for Manufacturing** program builds on the success of the NAM-endorsed Manufacturing Skills Certification System. The program provides fast-track, for-credit education at a community or technical college combined with a paid internship with a local manufacturer. Right Skills Now students earn ACT's National Career Readiness Certificate and at least one technical certification recognized by the NAM-endorsed Manufacturing Skills Certification System. In addition, participating institutions build pathways in which Right Skills Now coursework is applied toward an associate degree in manufacturing or a related discipline.<sup>10</sup>



Association for Career and Technical Education  
1410 King Street, Alexandria, VA 22314  
Phone: 800-826-9972 • Fax: 703-683-7424  
[www.acteonline.org](http://www.acteonline.org)  
Connecting Education and Careers