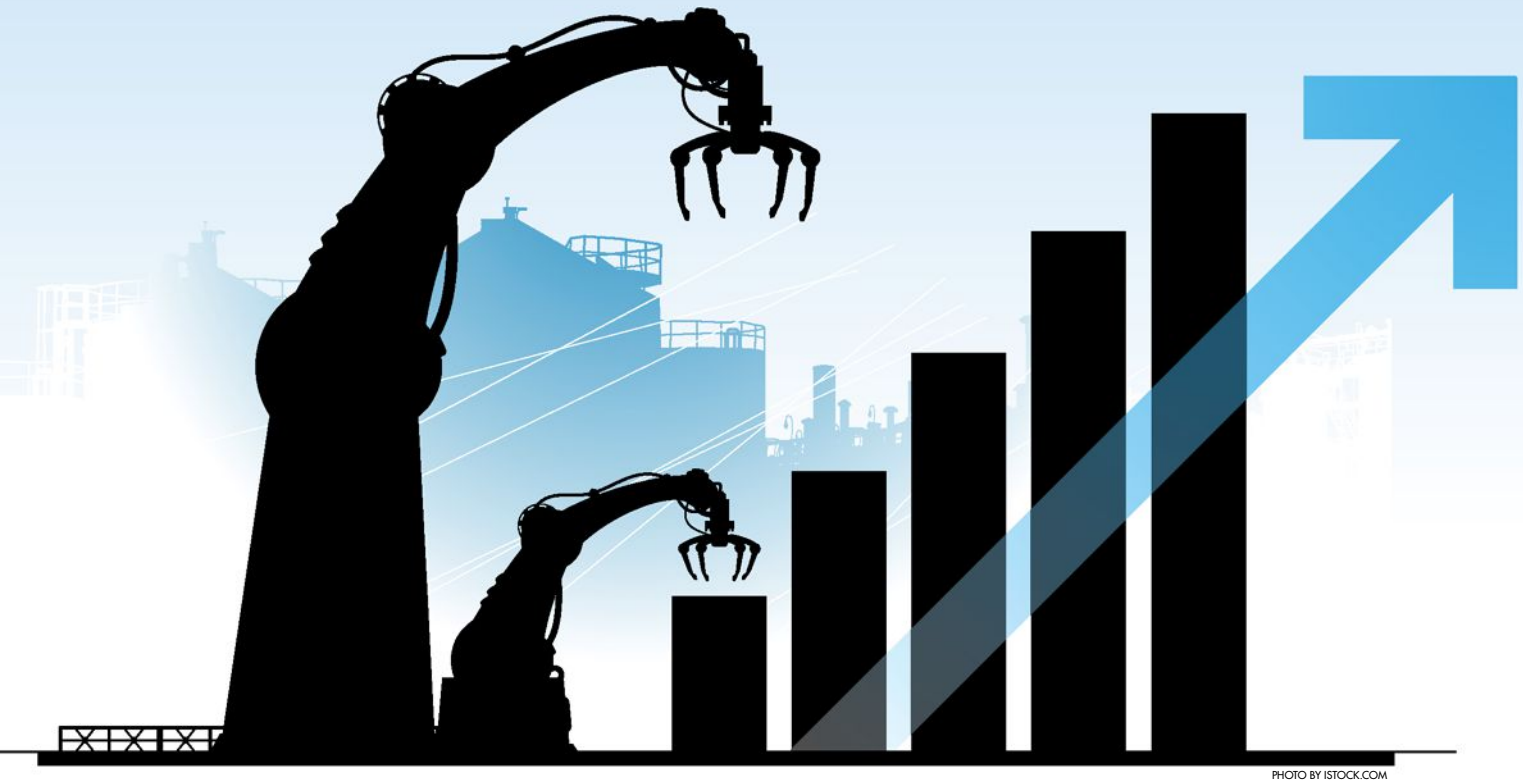
MANUFACTURING

CAREERS, SKILLED WORKERS AND THE ECONOMY



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BY LISA MARTINO

In order to jumpstart our economy, "Made in the U.S.A." needs to be synonymous with in-demand, high-quality products sold throughout the world. Recognizing the importance of the manufacturing industry and its connection to a healthy economy, President Obama addressed Carnegie Mellon University and launched the Advanced Manufacturing Partnership (AMP) earlier this summer.

"Today, I'm calling for all of us to come together—private sector industry, universities and the government—to spark a renaissance in American manufacturing and help our manufacturers develop the cutting-edge tools they need to compete with anyone in the world," said President Obama in June.

The AMP will invest $500 million to help improve technologies of manufacturing processes in high-tech industries for global competitiveness. Some industries of emphasis will be information technology, biotechnology and nanotechnology.

President Obama stated, "With these key investments, we can ensure that the United States remains a nation that 'invents it here and manufactures it here.'"

The administration has also secured commitments from businesses and universities to make it possible for 500,000 community college students to earn industry-

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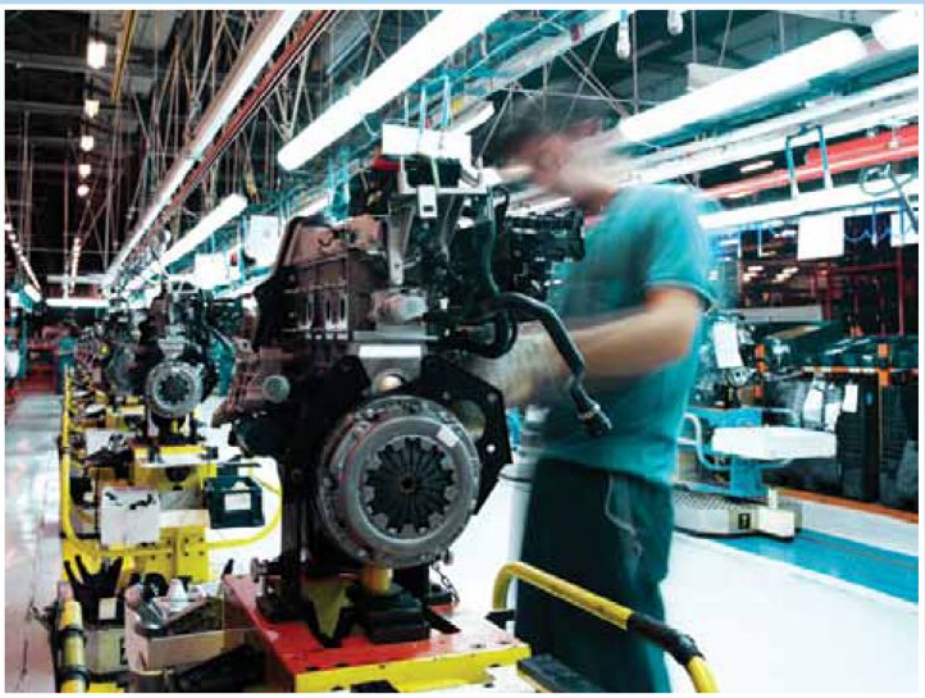

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accepted credentials for manufacturing jobs that companies across the country are looking to fill.

Manufacturing Industries

Through the AMP initiative, industries will benefit as new technology will be shared and customized across the manufacturing industries, allowing for increased efficiency and production. This program can potentially help companies produce efficient, alternative energy sources, invent new products at a faster pace using new technology, develop new life-saving pharmaceutical drugs, as well as build and design cities with little pollution. These industries include, but are not limited to, automation, automotive, chemical, construction, electronics, engineering, environmental, food and beverage, furniture, heavy machinery, metals, mining, oil and gas, paper, plastics, telecommunications, and textiles. In order to accommodate this technological advancement, the manufacturing sector will need a qualified, trained workforce.

Types of Careers

AMP promises the creation of jobs for mechanical engineers, scientists, computer programmers, technicians, design drafters, machinists, quality control managers, production line workers, robotic engineers, and manufacturing managers. Many of these jobs are high-paying occupations; for instance, according to CNN Money.com, mechanical and robotics engineers are in the hot-jobs list and can earn between $80,000 and $110,000 per year. Topping that, manufacturing managers can make between $110,000 to $130,000 a year (Money.cnn.com). With support from the AMP initiative—which includes government, industry and private sectors—manufacturing industries could become America's next big career boom.

Required Skills and Aptitudes

Contrary to popular stereotypes, manufacturing workers today need to be highly skilled. They need a strong background in algebra and trigonometry, as well as computer hardware and software applications. Strong communication and research skills are required as well. If a high school student decides to go on to a technical school or a community college for a one-year certificate in manufacturing, it would be wise to first take algebra, trigonometry, a basic writing course, and a basic computer course if he or she lacks any of those skills. There are opportunities for advancement for workers with a one-year certificate from a postsecondary program in engineering, management and computers—which may lead to the high-paying jobs listed above if workers receive additional education and work experience.

High-demand Fields

Information technology (IT) is in very high demand, according to CNN Money.com. IT consists of a multitude of computer-based skill sets that all businesses rely on, including manufacturing companies. Since AMP will be focusing on advanced robotics and computer systems for the purpose of streamlining the manufacturing industry, the field of

computer programming will continue to grow in demand. A skilled workforce will be required to design, manage and operate new technology, and this technology will most likely focus on improving Computer-Aided Design (CAD)/Computer-Aided Manufacturing (CAM) systems. Most manufacturing factories are automated with what are called CAM systems—computer-aided robotic machines that streamline the manufacturing of products for high-quality precision. Some computer-aided manufacturing systems are linked to CAD systems—a computer program that designs the product and feeds the design into the CAM system. A course in CAD/CAM is a requirement for postsecondary degrees past a one-year certificate. It would be helpful to have background knowledge of computer systems in general before attempting this course.

Robotics and alternative energy could be aggressively funded because there are big needs in these areas at present. Robotics will help factories become more efficient, and alternative energy sources will help our country rely less on foreign oil. These areas are very competitive, so employers will likely seek out the most qualified students for their future workforce.

Products in the drafting stage in the areas of biotechnology and nanotechnology could be considered impossible to achieve now, but with innovative inventors, engineers and scientists, all things are now possible. In order to prepare for this field, students again must focus on math, science, computer science, robotics, and strong writing and communication skills.

One-year Postsecondary Certificate in Machinist Technology

A machinist uses precision tools and computer-aided machines to make metal parts. With a one-year certificate program, a worker can find an entry-level job as a machinist. According to the U.S. Department of Labor's *Occupational Outlook Handbook*, 2010-2011 edition, career employment in machining is projected to slowly decline, but "job opportunities are expected to be good." The U.S. Department of Labor states that a machinist had a median earning rate of $17.41 per hour in May of 2008.

The Pennsylvania College of Technology has a certificate course in Applied Technical Studies: Machining Emphasis. This is a one-year certificate program that includes courses in mill applications, lathe applications, career mathematics, technical algebra and trigonometry, information technology and society, basic machine tool programming, CNC (computer numerically controlled) programming and machining, machine tool applications, occupational health and safety, and English. CNC programming skills help the machinist to perform cutting duties in order to produce metal parts.

A certificate in this program can give a worker career opportunities as an entry-level machinist, machine repair mechanic, or a set-up person for a production line. A machinist must be able to read blueprints/technical manuals and have strong computer skills. For someone who wants to work soon after high school, this is a great way to start. There are opportunities for advancement if you want to continue your education while you work, and there may be on-the-job training as well as apprenticeship programs available.

Two-year Postsecondary Degree in Industrial Maintenance

A postsecondary two-year degree in industrial maintenance will enable a person to obtain an entry-level position as an industrial machinery mechanic or a machinery maintenance worker. These positions could eventually lead to advancement to become a millwright after a four-year apprenticeship program (either on-the-job or through a union or state program). Millwrights are skilled workers who install, assemble and dismantle machinery.

According to the U.S. Department of Labor Statistics in May 2008, millwrights earned an average hourly wage of between $17.85 and $30.53 per hour, with the highest 10 percent earning more than $37.02 per hour. Industrial machinery mechanics earned between an average of $16.87 and $25.82 per hour, with the highest 10 percent earning more than $31.40 per hour; and machinery maintenance workers earned between an average of $13.75 and $22.82 per hour, with the highest 10 percent earning more than $28.10 per hour.

The *Occupational Outlook Handbook* notes this about industrial machinery mechanics and millwrights: "Employers also prefer to hire those who have taken high school or postsecondary courses in mechanical drawing, mathematics, blueprint reading, computer programming or electronics." Manufacturing companies are seeking skilled workers with a background in electricity, electronics, hydraulics and computer programming for these positions. Postsecondary programs focusing on these careers should include courses in shop mathematics, blueprint reading, welding, electronics, and computer op-

eration. Soft skills coveted by employers include: good problem-solving abilities, mechanical aptitude, manual dexterity, reading comprehension, and good communication abilities. For people interested in these positions, heavy lifting and agility are required.

The Future Begins Now

Because the AMP initiative will focus on technological advancement in manufacturing production, computer programming, and robotics, these three careers may likely see an increase in demand. Continuing education will be required to keep up-to-date on emerging technology and new equipment. The manufacturing industry has boosted our economy in the past, and can do this again with the right support and training for our workforce. The AMP initiative, with its funding focused on advancements in robotics and efficient computer programming, could increase production in manufacturing industries across the board. This, in turn, will increase demand for skilled workers. High schools, technical schools and colleges should prepare themselves for this need by providing programs that train our workforce to meet this challenge. T

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Lisa Martino

is a CTE graduate student at the University of Central Florida, freelance writer and ASM instructor at WyoTech, Daytona. She can be contacted at lisamartino103@gmail.com.

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