

NORTH SHORE WIB:
STEM INDUSTRY PROFILE

Advanced Manufacturing

Advanced Manufacturing is a relatively new concept not fully defined in a uniform manner by researchers and those in the field. The term “advanced manufacturing” encompasses many of the developments in the manufacturing field during the late 20th and early 21st centuries, including high tech products and processes and lean, green, and flexible manufacturing, among others. No one definition captures everything said about advanced manufacturing, although the majority of definitions found on the web include the use of innovative technology to improve products and/or processes, and many also include the use of new business/management methodologies. — WIKIPEDIA

Massachusetts Job Growth Forecast of Typical Jobs Found in Advanced Manufacturing Companies

JOB TITLE	EMPLOYMENT 2012	EMPLOYMENT 2022	AVERAGE ANNUAL JOB OPENINGS	AVERAGE ANNUAL WAGE
Engineers	48,476	51,816	1,593	\$95,363
Drafters, Engineering Technicians, and Mapping Technicians	18,931	18,385	385	\$57,559
Computer-Controlled Machine Tool Operators, Metal and Plastic	2,556	2,669	83	\$41,930
Heavy and Tractor-Trailer Truck Drivers	22,429	24,796	596	\$47,170
Industrial Machinery Mechanics	3,916	4,589	180	\$53,570
Inspectors, Testers, Sorters, Samplers, and Weighers	8,524	8,614	196	\$42,320
Machinists	9,145	9,124	210	\$47,640
Welders, Cutters, Solderers, and Brazers	2,986	2,947	73	\$46,380

Source: Massachusetts Executive Office of Labor and Workforce Development

Necessary Skills

Workers in Advanced Manufacturing need skills such as math, science, engineering, machining, computer skills, and various types of middle-skilled labor, along with teamwork, communication skills, and creative thinking.

Participating North Shore Advanced Manufacturing Companies

- Applied Materials – Gloucester, MA
- Fleet Machine – Gloucester, MA

Company Profile: Applied Materials

Applied Materials is a global leader in providing innovative equipment, services and software to enable the manufacture of advanced semiconductor, flat panel display, and solar photovoltaic products. The company operates in four segments: semiconductor, applied global services, display, and energy/environmental solutions. The company employs 13,700 worldwide and between 500 and 1,000 in its Gloucester facility. Primary STEM occupations include many different types of engineers, such as mechanical, electrical,

Note: This industry profile is based on information shared at the North Shore STEM Guidance/Teacher event held on May 7, 2014 at Analogic Corporation.

systems, and process. Also employed are technicians at various levels of expertise—military experience is very helpful. Finally, people with business development expertise are in demand as well.

Company Profile: Fleet Machines

Fleet Machine is an example of a small Advanced Manufacturing company, employing eight people and focusing on customized products for a variety of clients across the Manufacturing spectrum. In an increasingly competitive global manufacturing environment, Fleet Machines provides the technological edge that enables their clients to exceed quality and on-time delivery requirements and budget goals. Their unique software as a service (SaaS) shop management software enables their clients to track the progress of each order. Their quality department leverages statistical methods to monitor and control all manufacturing processes. Primary STEM occupations include Skilled Machinists and Business Development experts.

Critical Technical and Core Competencies

Identified by Employers at Applied Materials and Fleet Machines

Technical Skills

Primary technical skills now needed—and what will be needed in the future? Engineering skills (both theoretical and technical) are now and will continue to be in demand well into the future. This involves the ability to solve problems and develop new solutions and products to make customers satisfied with the services provided. The ability to not only design but to participate in the actual manufacture of products at some level is critical. Skills and high comfort level

in using various software package—both Microsoft as well as machining/CAD-CAM/other packages very important. Math (calculus) is very important as well as writing skills.

Core Competencies

Primary core competencies now needed—and what will be needed in the future? Critical competencies include the ability to work in teams, the ability to write, and the ability to present data in a way that informs and provides needed support to co-workers and customers. Applicants who have been on athletic teams, robotic teams, have previous work experience, or have, on their own, participated in projects that show teamwork, initiative, creativity, and problem solving are particularly attractive to this industry. A good, solid appearance, as well as general good work habits are also must. In the case of small business, students should show an entrepreneurial spirit that contributes to the growth of the company.

Other North Shore Advanced Manufacturing Companies

- Bomco
- Axcelis
- General Electric
- Thermal Circuits



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