



Northrop Grumman Apprentices Strengthen America's Defense

“Northrop Grumman products are highly engineered and built over a long period of time, so we need to train employees who will be with us for the long haul, and also give them the opportunity to grow into leaders that will help shape future generations.”

Dr. Robert P. Leber
Director of Education and Workforce Development
Northrop Grumman

Despite the past few decades of explosive growth in technology and outsourcing of manufacturing, there is still strong demand and need for skilled craftsmen and a smart, skilled labor pool in the United States. Why? There are thousands of types of jobs that cannot be outsourced or sent overseas, and they will be done here in the United States for generations to come.

Building cutting-edge war ships is but one of those crafts, and teaching these highly specialized skills through an apprentice program is the most cost-effective and strategic way to ensure the highest-quality product and ongoing maintenance infrastructures in the industry. Northrop Grumman's Apprentice School is the gold standard in the field.

■ **Apprentice School: Education that Works**

Northrop Grumman's Apprentice School is an educational and career opportunity unlike any other, providing fully paid, comprehensive four- and five-year apprentice programs for students interested in shipbuilding careers.

Since 1919, the company's Apprentice School has produced more than 9,000 graduates. Currently 750 students strong, the Apprentice School was formed not just to teach the trade but also to create future leaders. The mission still holds true today.

“Building and maintaining Navy-ordered nuclear-powered aircraft carriers and submarines that will defend our country and keep peace in the world is not only a rewarding experience but also an excellent opportunity

for apprentices to learn about heavy manufacturing and construction in the most modern shipbuilding facility in the world,” said Robert Leber, Northrop Grumman's director of education and workforce development and head of the company's Apprentice School.

“Our company invests over \$100,000 per student in their training and education because we know the program works, and we believe it is the best way to develop the kind of workforce we know we need.”

“Our Apprentice School builds three types of ‘ships’ — craftsmanship, scholarship and leadership.”

Dr. Robert Leber

Today, more than 2,500 graduates of the Apprentice School are still in the Northrop Grumman workforce and serve in 240 different types of jobs at the company's operations in Newport News, up and down the ranks from nuclear pipe welders to senior executives.

The vice president of operations at the Newport News shipyard is an Apprentice School graduate, as are more than 70 senior managers and directors. In all, 42 percent of Northrop Grumman's Newport News line management are Apprentice School graduates.

“Having gone through the Apprentice School, these managers understand production top-to-bottom from a craft perspective. There's no better way to train this kind of depth of management and product-build understanding than our apprentice program,” said Leber.

A diverse applicant base (of which there is a 10-to-1 application-to-admissions rate) provides a well-rounded student body, including 135 women, in which there is ample opportunity for not just learning a trade or skill but also developing leadership skills. The standard Apprentice School program is four years long, and if a student chooses to do so, he or she can earn an associate degree in engineering, engineering technology or business administration by taking on an additional fifth year of classes and skills training.

“We like to say that our Apprentice School builds three types of ‘ships’ — craftsmanship, scholarship and leadership,” said Leber.

Northrop Grumman’s Apprentice School comprises 16 full-time academic instructors at the school itself, supplemented with 25 adjunct professors. All of the academic credit hours are taught at the school and are transferrable through articulation agreements with local colleges and universities, including Thomas Nelson Community College, Tidewater Community College, Old Dominion University, Saint Leo University, Christopher Newport University and Hampton University.

The Apprentice School trains apprentices in the following 18 craft areas: dimension-control technician, electrician, electrician maintenance, heating and air conditioning, heavy-metal fabricator, machinist, millwright, nondestructive tester, outside machinist, painter-insulator, pipefitter and pipefitter maintenance, rigger, sheet metal worker, shipfitter, welder, welding equipment repairer, and molder.

There also are advanced apprenticeship programs in marine design, modeling and simulation, nuclear testing, production planning, cost estimating, and advanced shipyard operations.

Apprentices selected for those programs spend two years on the waterfront and the remainder of their apprenticeship in the specialized program for which they are selected. Apprentices chosen for the advanced

programs are nominated by their mentors and instructors during their first year and are selected based on academic grades, discipline, craft performance, attendance, attitude and aptitude for the work.

Northrop Grumman Apprentice School apprentices are paid for all work, including time spent in academic classes, and they also receive paid vacations and holidays, a 401k plan, medical plans, life insurance, workers’ compensation, unemployment insurance, and Social Security benefits.

One of the most interesting aspects of the program is that applied skills are embedded into technical content, meaning that some of what are considered “soft skills,” such as writing, communications, interpersonal skills and time management, are integrated into the program’s existing content and curriculum. Growth and development in these applied-skills areas are overseen, evaluated and developed by an apprentice’s mentor and the school’s Student Services division as part of overall program oversight.

A Brief History of Apprenticeship

For thousands of years — dating back to ancient Greek and Egyptian civilizations — there has been a recorded tradition of passing down the skills and knowledge of craftsmanship from one generation to another. This kind of working education is commonly referred to as “apprenticeship.”

Apprenticeship is a formal training program that allows a person to receive thorough instruction and experience — both theoretical and practical — in all areas of a skilled trade. Today’s apprentices are paid a salary while they train on the job and in the classroom.

America has a rich history of modern apprenticeship, with tradesmen and craftsmen passing down their knowledge and expertise in the areas of plumbing and electrical work, dental laboratory operations, computer technology, airplane construction, and shipbuilding, for example.

■ Filling a Market Need and Shaping the Future Workforce

It’s no secret that with the baby boomer population advancing toward retirement, there is a need to recruit, train and develop a generation of strong, strategic and skilled workers and leaders to take their place in the workforce. With that in mind, Northrop Grumman’s Apprentice School continually evaluates the company’s current and future needs and evolves its academic and skills training programs accordingly.

“Every apprentice class reflects the realities of what the Yard needs,” said Leber. “We forecast years ahead of time what skills and areas we need to not only replace but build for future technological advances. It shapes how we recruit and how we tailor our curriculum and training to not just meet current operational needs but also anticipate future workforce requirements.”

This also includes knowing and anticipating customers’ needs as well. Northrop Grumman’s leadership development component at the Apprentice School reflects the leadership development program used at the U.S. Naval Academy in Annapolis, so that there is almost a seamless feel among those served by this program. With a philosophy of “training courageous followers,” Leber believes the skills people learn in being a courageous follower — honesty, teamwork, communications and interpersonal skills — are the same skills they need to understand, build on and master to be a great leader.

■ Training for Life, Not Just Work

Because the Northrop Grumman Apprentice School offers a unique combination of skills training, academics and leadership development, the program prepares students for life and adulthood, not just a job. The program also

creates an unprecedented level of employee retention; in fact, five years after completing the program, 80 percent of graduates remain with the company.

How does Northrop Grumman create a sense of loyalty and a student body ready to learn? During the application process, admissions officials screen for readiness by checking an applicant's transcripts and conducting interviews so they can determine a candidate's readiness, basic communications skills and attitude.

"Once they come through the door, they're ours," said Leber. "They have to want to do this, or they won't succeed. We have an incredibly strict and structured program, but at the same time, it's also conducted in a nurturing environment. We want our apprentices to succeed."

The Apprentice School has a multilayered mentoring and development program that acts, where necessary, as a kind of remediation triage system. The school's Student Services group monitors apprentices' work as well as their test and quiz scores, specifically in the areas of math and reading comprehension. If they see weaknesses in these areas — which are often noticeable in the first few weeks of an apprentice's time in the program — they can intervene and work to bring the apprentice up to speed through tutoring or other assistance programs.

Leber estimates that approximately 40 percent of new apprentices receive some type of remedial training, mainly in applied math, ranging from a one-week refresher class to an 11-week course.

Another layer of oversight and coaching is led by the school's 61 craft instructors, all of whom also are Apprentice School alumni. Upon being accepted into the program, each apprentice is assigned a craft instructor. Incoming first-year students also are assigned to a fourth-year apprentice as a peer mentor.

Together, Student Services, the instructors and the fourth-year students guide the apprentices

as they move through the program and work with them in the areas in which they most need help — not just the skilled craftsman areas of the program but also leadership skills. Northrop Grumman operates within a set of leadership principles, and in the Apprentice School, those principles are defined by behaviors against which new apprentices are measured, coached and instructed.

In addition to the classroom and workplace skills training, the Apprentice School also provides housing counseling to help students find affordable housing in the area, as well as financial planning counseling to help students develop a budget and learn good money-management skills.

■ Where Do We Grow from Here?

There will always be a need for the kinds of skills the Apprentice School teaches, and the company has plans to ensure strategic growth of the program to anticipate and shape future needs.

Today, apprentices complete the apprentice program, and many earn an associate degree. In the future, the company plans to build in a bachelor's degree program for selected apprentices, tailored toward engineering, engineering technology and business administration.

Northrop Grumman also plans to grow capacity for the program overall, upping the student body from 750 today to 1,000 in the next decade to address the upcoming increase in retirement by some of the older workforce. The school is enhancing its curriculum to cover areas of financial management, cost estimating and program management, because knowing how to oversee the manufacture of a multibillion-dollar warship requires special training, and the company's management believes their in-house expertise makes them best suited to train and develop their future leadership.

About Corporate Voices for Working Families

Corporate Voices for Working Families is the leading national business membership organization representing the private sector on public and corporate policy issues involving working families. A nonprofit, nonpartisan organization, we improve the lives of working families by developing and advancing innovative policies that reflect collaboration among the private sector, government and other stakeholders.

Find Out More

This case study is part of the comprehensive research report *The Ill-Prepared U.S. Workforce: Exploring the Challenges of Employer-Provided Workforce Readiness Training*. This research study and publications, other research studies and toolkits on a host of workforce readiness, flexibility, family economic stability, and work and family balance issues are available on the Corporate Voices Web site at www.corporatevoices.org.

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About Northrop Grumman

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Northrop Grumman Corporation is a global defense and technology company whose 120,000 employees provide innovative systems, products and solutions in information and services, electronics, aerospace, and shipbuilding to government and commercial customers worldwide.