



The Apprentice School

Newport News Shipbuilding

www.as.edu

Training the Next Generation of Shipbuilders

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Newport News Shipbuilding's Apprentice School offers four- to five-year, tuition-free apprenticeships in 19 trades and six optional programs. The school is committed to fostering apprentices' development of craftsmanship, scholarship and leadership. Apprentices work a regular 40-hour week and are paid for all work, including time spent in academic classes.

What is Apprenticeship?

An apprenticeship is a formal training program that combines on-the-job experience with classroom instruction in a skilled trade. The average apprenticeship at Newport News Shipbuilding is completed in four to five years. Upon graduation, apprentices are fully trained, well paid and have skills that will serve them well throughout their career.





COATINGS SPECIALIST

Nearly every component or structural element on a ship requires specific coatings. Coatings specialist apprentices are trained to properly apply a variety of marine coating systems. Coatings protect the steel and other surfaces from rust and corrosion, protect the underwater hull from marine life attachment and enhance the general appearance of the ship. Coatings specialist apprentices prepare the surfaces, cover areas that do not require paint, sandblast surfaces, apply the proper coating, and ensure suitable drying and curing conditions.

COST ESTIMATOR*

Cost estimators perform an important role within the Contracts and Pricing section of the Business Management organization. Cost estimators develop material and man-hour estimates, analyze and compare cost information for proposal variances, project funding progress, and compile estimate documentation to support contract negotiations. Estimating apprentices will evaluate customer requirement documents, participate in job scope development and budget distribution, assist with planning workflow for trades departments, and analyze performance to budget.

ELECTRICIAN

Naval ships require several miles of cable to supply power, from its source, throughout the ship. Electrician apprentices learn to install, operate and test electrical systems onboard ships. These systems

include lighting, power distribution, machinery, interior communications, fire control/weapons systems, testing and nuclear plant work. They will work with drawings to devise a plan for their jobs, so they can identify equipment location and cable runs. Electricians construct and install various electrical components and are required to complete a rigorous series of electrical theory courses to complement on-the-job training.

HEATING AND AIR CONDITIONING WORKER

The shipyard's large facility requires a maintenance group to service heating, ventilation and air conditioning units. Heating and air conditioning apprentices learn to install, repair and maintain a wide variety of systems throughout the shipyard. These systems include water fountains, window air conditioners, heating units, air dryers, chilled water systems, and 3

to 60-ton air conditioning systems. Apprentices also perform routine preventative maintenance on all systems to ensure they function properly. Heating and air apprentices will take detailed theory courses to prepare them for the field.

HEAVY METAL FABRICATOR

There are many unique shapes that must be formed from massive pieces of steel to construct the several sections of a ship. Heavy metal fabricator apprentices learn the processes and procedures of the shipyard's Steel Fabrication Shop. They learn to use a variety of tools and machines that cut, burn, bend, move and press steel into shapes needed for ship construction. Apprentices also learn how to lay their work out to validate the shape prior to extracting it. They create a large portion of the parts and plates needed to build aircraft carriers and submarines.

*** OPTIONAL PROGRAMS:** After an apprentice spends two years in a waterfront trade program, they will become eligible for one of the optional programs. The criteria for selection includes academic grades, craft performance, attendance, personal interest and aptitude. Admission into these programs is limited and on a competitive basis. Optional programs extends the total apprenticeship experience an additional year.

INSULATOR

Insulation ensures efficient operation of equipment, minimizes energy loss, reduces or eliminates noise transmission and prevents injury. Insulator apprentices learn to fabricate, manufacture and install various kinds of insulating materials. Apprentices cut and form insulation materials, make molded plastic forms, laminate fiberglass cloth and mix bonding materials such as cement, epoxies and resins. They also learn to apply these skills through a variety of work experiences encompassing product lines such as submarines and aircraft carriers.

INSIDE MACHINIST

Several core components on naval vessels must be produced from metal with a high degree of accuracy. Machinist apprentices learn to operate all major types of manual and computer numerically controlled (CNC) machine tools in

the shipyard's machine shops. Some of the equipment includes: boring mills, lathes and milling machines of all sizes. After apprentices display competency in manual machine tools, they progress to CNC equipment to learn modern processes and programming with CAD/CAM software systems. They work a wide variety of metals to produce brackets, bolts, shafts, bushings and other machined parts.

MAINTENANCE ELECTRICIAN

The shipyard's numerous facilities require installation, maintenance and repair of all electrical systems and components. Maintenance electrician apprentices learn to provide power for new equipment and lighting. They also learn to maintain and troubleshoot virtually every electrical and electronic component in the shipyard. The work may take apprentices anywhere, from an underground transmission line to the

top of a 23-story crane. They will take several theory courses to learn the importance of electrical safety. Work assignments can vary from installing a simple electrical outlet to repairing and maintaining complex numerically controlled equipment.

MAINTENANCE PIPEFITTER

There are piping systems throughout the entire shipyard that serve the facilities with water, gas and air. Maintenance pipefitter apprentices learn to maintain the various piping systems throughout the shipyard's 550-acre facility. Maintaining these piping systems and facilities is critical to shipyard operations. Apprentices in this trade become proficient in many skills and processes, including bending, threading, brazing and welding. They also learn how to overhaul valves and repair piping systems of various materials such as steel, copper and PVC.



MARINE DESIGNER*

Apprentices selected for this program will prepare a variety of engineering documents including drawings, liaison and discrepancy reports. Students will utilize PC-based design software including computer-aided drafting and specification/technical libraries. Design students will take courses specifically developed for the Marine Design apprenticeship including computer aided design and parametric solid modeling.

METROLOGY TECHNICIAN*

Metrology technicians perform comprehensive industrial measurement surveys of the ship, its systems and components. Technicians use metrology equipment for precision setting, alignment and dimensional verification of structures, weapons systems, machinery and propulsion systems. Electronic accuracy control plans are used to predict and reduce the variability of fabricated, machined and assembled products through the various stages of the shipbuilding and manufacturing processes.

MILLWRIGHT

Millwright apprentices install, maintain, repair and overhaul shipyard machinery. Apprentices learn to operate a number of machine tools including lathes, milling machines and drill presses in manufacturing parts used to repair production equipment. They also inspect and maintain cranes throughout the entire shipyard and repair machinery in the various waterfront shops. Apprentices will work in an automotive shop to repair company vehicles and other transportation equipment.



MOLDER

Many components are cast from molten metal because the unique shapes can be obtained easier than machining them from a solid piece. Molder apprentices work in the shipyard's Foundry, one of the few foundries in the United States capable of pouring a large variety of ferrous and nonferrous metals. They receive an overview of each foundry operation and learn necessary processes to produce a finished casting from raw materials. Apprentices are exposed

to everything from building the mold, pouring the molten metal into the form and cleaning up the castings with grinders to drawing specifications once they have cooled.

NON-DESTRUCTIVE TESTER

All critical components on a ship must be tested to verify their integrity to ensure they will uphold to designed stresses. Non-destructive tester apprentices operate a variety of equipment which typically involve calibrating equipment, conducting the actual test, evaluating the results and writing an inspection report. They gain experience in radiographic, magnetic particle, liquid penetrant, ultrasonic and eddy current inspection methods. Apprentice training also provides experience in visual inspection, quality, planning, technical applications, quality standards and codes interpretation.

NUCLEAR TEST TECHNICIAN*

Technicians function as the on-site representative of the shift test engineer (STE) to oversee all elements of plant testing aboard ship to include mechanical and electrical systems within the plant. Technicians coordinate plant testing with the trades, inspections, radiological control and naval personnel. Technicians support procedure writing, planning, technical support and nuclear engineering training groups.

OUTSIDE MACHINIST

Once all mechanical components are manufactured, purchased and obtained, they must be installed onboard the ship. Outside machinist apprentices install, repair and test a ship's major machinery and other mechanical components. Many of these systems are responsible for

the ship's propulsion, steering and weapons systems. They learn the safe operation of shop machines and hand and power tools to install and test systems on nuclear reactors, turbines, generators, pumps, propellers, rudders, elevators, periscopes and armaments. Apprentices also learn the function and operation of motors, pumps and valves.

PATTERNMAKER

Foundry castings are dependent on the wooden pattern made in the shape of the finished part. Patternmaker apprentices learn the fundamentals of wood and tool selection and shaping, forming and joining techniques. They lay out and construct simple patterns before training progresses to more complex jobs, including collapsible, unusually shaped and large patterns. The quality of the casting weighs heavily on the quality of the pattern.

Apprentices learn a variety of machines including: wood lathes, jointers, routers, planers and saws. They will also be exposed to CAD/CAM software systems that control modern processes and tool paths.

PIPEFITTER

A ship's pipes carry vital fluids and gases necessary for the ship and its crew to function. Pipefitter apprentices learn how to install, inspect and test the many piping systems on board aircraft carriers and submarines. They go through pipe theory, learn how to tack weld and braze and learn the basic skills necessary to function as a pipefitter. Pipefitter apprentices help to put the complex piping network together by cutting, bending, prepping and hanging piping runs on ships. They are required to install valves and make up flanges where required by the drawings. Testing crews operate and inspect the systems for leaks or flaws.

PRODUCTION PLANNER*

Apprentices selected for this program will become proficient in the use of various computer systems that are used for planning and controlling work on various product lines. They will rotate through related work areas to become experienced in program planning and scheduling, work breakdown structure, operational planning and shop floor planning.

RIGGER

There's always a need to move material, equipment and machinery to support all other trades. Rigger apprentices learn basic rigging fundamentals, how to properly hook up loads and how to signal to crane

operators for movement. In addition, they learn to fabricate wire rope pendants for rigging aboard ships, install temporary services and work in the tool room. Apprentices are a part of large ship section lifts, blocking and shoring that supports the initial ship's construction, and they erect and assemble a variety of staging platforms to support the needs for the trades to safely accomplish their jobs.

SHEET METAL WORKER

The majority of a ship is fabricated from large pieces of steel, but a lot of the interior components are assembled from light-gauge metal. Sheet metal apprentices learn to construct items, such as lockers,

foundations, stowage bins and racks, workbenches, galley furniture, bulkheads, terminals and ventilation duct work. They install all of these and many additional items, such as ventilation equipment, furniture, doors, ladders, handrails and trim work on board ships. Additionally, apprentices learn to weld, develop patterns, interpret a wide range of trade drawings and use layout techniques for fabricating and installing a variety of sheet metal work.

SHIPFITTER

The ship's internal and external frame is constructed of large pieces of plate and then fitted with decks and bulkheads. Shipfitter apprentices

contribute to all structural phases of the ship's hull construction, including fabrication, assembly and alignment of the ships structures. They position and fit steel together so the pieces can be permanently welded in place. Apprentices learn to tack weld to prevent their assemblies from moving. They also install other structural components, such as hatches, doors and foundations to complete the steel work of the ship and gain experience in submarine and aircraft carrier construction and aircraft carrier overhaul.

SUPPLY CHAIN SPECIALIST*

The Supply chain specialist apprentice will develop and manage purchase orders as well as build relationships with suppliers for both Navy contract work and purchasing for various areas in the company. Apprentices will also gain experience in the compliance office focusing purchasing, property and material management and

accounting systems. Apprentices will participate in the storage and movement of material, and utilize the practices, procedures and requirements associated with material management. This experience is gained by job rotations in various shipyard warehouses, storage facilities and working with the company's transportation department.

WELDER

Ships today are joined by weld in all areas, such as hull, bulkheads, decks, foundations, piping and machinery. Welder apprentices will learn a range of manual, semiautomatic and automatic welding processes in the shipyard's welding school. They learn how to check for metal preparation and how to interpret the many different types of weld symbols. Apprentices use a wide range of metals and welding processes to perform structural and pipe welds in all phases of submarine and aircraft

carrier construction and overhaul. Welder apprentices also learn to safely use torches to preheat areas before they are welded.

WELDING EQUIPMENT REPAIRER

The shipyard maintains welding equipment of all forms and sizes. Welding equipment repair apprentices receive training on the electrical system that provides power to the welding equipment before they move into learning to test, troubleshoot, repair and maintain welding and burning equipment. As part of the training, apprentices are required to complete an extensive series of electrical theory courses to complement the mechanical and electronic on-the-job training needed when servicing a wide range of welding and burning equipment. Their training includes shop maintenance, as well as service calls to various areas in the yard and onboard ship.



CRAFT TRAINING

During the 7,000 hours of on-the-job training, apprentices are supervised and evaluated by qualified craft instructors. In addition to teaching the various theory classes, the instructors coordinate a job rotation schedule, ensuring complete understanding of the technical and production demands of each trade.

ACADEMIC CURRICULUM

The required academic curriculum consists of instruction in the subject matter areas of math, drafting, digital shipbuilding and technology, history, mechanics, psychology, business operations and leadership, physical science, ship construction and communications taught by academic instructors of The Apprentice School.

The Apprentice School awards Associate of Applied Science in Maritime Technology degrees upon completion of an assigned program.

BENEFITS

- Paid Vacation
- Health and Life Insurance
- Paid Holidays (11)
- Sickness and Accident Benefits
- Comprehensive Medical Plan
- (401)k Company Match Savings Plan
- Education (tuition, books, and fees)

APPRENTICE ACTIVITIES

The Apprentice School Student Association offers extracurricular activities for students, including community service opportunities and social gatherings. The school's intercollegiate athletic program provides apprentices with an opportunity to participate in six varsity sports: men's and women's basketball, football, baseball, men's and women's wrestling, and golf.

REQUIREMENTS

Applicants must be 18 years old and physically able to perform the duties of the trade experience upon hire. They must be a United States citizen who is able to obtain the proper security clearance. A high school diploma or its equivalent is required.

Candidates selected for The Apprentice School should have a strong math and science background and at least four of the following courses (with a C or better).

- ☐ Advanced Math
- ☐ Algebra I
- ☐ Algebra II
- ☐ Chemistry
- ☐ Computer Science
- ☐ Geometry
- ☐ Mechanical Drawing
- ☐ Physics or Principles of Technology
- ☐ Vocational/Technical Shop

NEWPORT NEWS SHIPBUILDING

Newport News Shipbuilding, a division of HII, is proud to design, build and maintain nuclear-powered aircraft carriers and submarines and provide fleet services for the U.S. Navy. We are the largest industrial employer in Virginia, employing more than 26,000 shipbuilders.

Learn more at HII.com.

APPLY ONLINE

Visit www.as.edu for details. The Apprentice School promotes a "rolling hiring" process and accepts applications throughout the year.

Candidates are required to submit an online application, pay the processing fee and forward all official transcripts for consideration.

Newport News Shipbuilding The Apprentice School Admissions Office

4101 Washington Ave.
Newport News, VA 23607
(757) 380-3809

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The State Council of Higher Education for Virginia has certified The Apprentice School to operate in Virginia.



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