Naval Architecture

Starting Salary (for Mechanical Engineering): $ 58,749

Median Income: $88,100

Naval architects are engineers who design all kinds of watercraft, or anything that can be used as transportation on or under water. This may be a ship, boat, submarine, seaplane, icebreaker, or offshore drilling platform. The vessels may be used for commerce, recreation, or naval operations, and can be big or small. They may be powered by sails, diesel, or gas turbine engines, electricity, or nuclear power.

Marine environments are tricky. One minute the seas are calm and the next can be a white-knuckle ride as the waves pound the side of your boat or seagoing vessel. To design for this unpredictability provides a challenge for the naval architect. Naval architects design boats with the following elements in mind:

- Hydrostatics—the study of the pressures exerted on the hull. For example, buoyancy is a hydrostatic force which enables an object to float.
- Stability—the boat's ability to remain afloat and right itself after a strong wind or wave.
- Hydrodynamics—the study of water in motion around the ship. It includes powering through the water, maneuvering and controlling the direction of the vessel, as well as the effects of water resistance around the hull.
- Strength, structure and construction—the selection of materials for the hull as well as the rudder, steering, and propeller design. Naval architects analyze the ocean forces that the boat may encounter during a storm at sea. This also includes the boat's strength in a collision or during accidental grounding.
- Interior Design. Ships are complicated, self-sufficient structures. They must carry all of the systems that enable the crew to live aboard for weeks or months at a time. Naval architects decide on the arrangement of the cabin, sleeping quarters, galley, head

Job Outlook

Employment of marine engineers and naval architects is projected to grow 10 percent from 2012 to 2022, about as fast as the average for all occupations. The need to design ships and systems to transport energy products, such as liquefied natural gas, across the globe will help to spur employment growth for this occupation.

Industries with the highest levels of employment in this occupation:

1. Architectural, engineering, and related services
2. Federal government, excluding postal service
3. Ship and boat building
4. Other professional, scientific, and technical services
5. Deep sea, coastal, and great lakes water transportation

Top paying industries for this occupation:

1. Federal government, excluding postal service
2. Architectural, engineering, and related services
3. Deep sea, coastal, and great lakes water transportation
4. Ship and boat building
5. Other professional, scientific, and technical services

Source: US Bureau of Labor Statistics

(bathroom), ventilation, fire protection, floor plan, capacity, water and sewage, weapons (on naval ships), propulsion, and cargo handling.

Naval architects often test the performance of newly designed boats and vessels in long towing tanks. These tanks are typically housed in government laboratories and universities around the U.S. and the world.

As you can see, naval architects have many considerations for each design element. There are some stock designs available for mass production boats, but the future of ship design is wide open. Every time a materials engineer designs a lighter, stronger, or faster hull, rudder, or propeller, it has the potential to change the hydrostatics, hydrodynamics, construction techniques, strength, or interior design of future boats and ships. Every time a new paper is published or new research is completed, there are opportunities for advancement, changes in existing strategies, and new horizons to sail.

For more information about naval architecture and preparing to work as a naval architect, visit the Society of Naval Architects and Marine Engineers at www.sname.org or pick up a copy of *The Maritime Engineer: Careers in Naval Architecture and Marine, Ocean and Naval Engineering*.

Glossary of Terms

Design – to plan and make (something) for a specific use or purpose (merriam-webster.com)

Hydrostatics – the study of pressures exerted on the hull

Hydrodynamics – the study of water in motion around the ship

Ice Breaker – a ship designed to clear a passage through ice (merriam-webster.com)

Performance – the manner in which a mechanism performs (merriam-webster.com)

Propulsion – the force that moves something forward : the force that propels something (merriam-webster.com)

Stability – the boat's ability to remain afloat and right itself after a strong wind or wave.

Test – critical examination, observation, or evaluation (merriam-webster.com)

ABET Accredited Programs in Navel Architecture Engineering			
School Name	**Location**	**Website**	**Program and Degree Name**
State University of New York Maritime College	Bronx, NY, US	www.sunymaritime.edu	Naval Architecture, BE
United States Coast Guard Academy	New London, CT, US	www.cga.edu	Naval Architecture and Marine Engineering, BS
United States Naval Academy	Annapolis, MD, US	www.usna.edu	Naval Architecture, BS
University of Michigan	Ann Arbor, MI, US	www.umich.edu	Naval Architecture and Marine Engineering, BSE
University of New Orleans	New Orleans, LA, US	www.uno.edu	Naval Architecture and Marine Engineering, BSNAME
Webb Institute	Glen Cove, NY, US	www.webb-institute.edu	Naval Architecture and Marine Engineering, BS