

Nuclear Engineers

SOC: 17-2161 • Career Profile Report

■ Key Facts

\$127,520 Median Salary	15,400 Employment	-1.0% Growth Rate
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■ Requirements & Salary Range

Education: Bachelor's degree

■ Automation Risk Assessment

Low Risk - 17.0% probability of being automated in the next 10-20 years.
This job is relatively safe from automation due to its creative, social, or complex problem-solving requirements.

■ Work-Life Balance

7.2/10 - Good work-life balance

■ Personality Fit (RIASEC)

Higher scores indicate better personality fit for this career type.

Realistic	8.2/10	Investigative	8.8/10
Artistic	6.4/10	Social	5.2/10
Enterprising	5.8/10	Conventional	6.6/10

■ Top Skills Required

Analytical skills, Communication skills, Computer skills, Detail oriented, Logical-thinking skills, Math skills, Problem-solving skills

✓ Strengths

- High Demand
- Flexible Work
- Continuous Learning

■ Challenges

- Burnout Risk
- Rapid Technological Change

■ What They Do

Nuclear Engineers are specialized engineers who design, operate, and improve **systems that harness nuclear energy and radiation** for power generation, medical applications, research, and national security. Their work focuses on safely controlling nuclear reactions, managing radioactive materials, and ensuring systems meet strict regulatory and safety standards. This field combines advanced physics, engineering, and risk management.

This career is well suited for individuals who enjoy complex problem-solving, high-responsibility work, and applying science to some of the most powerful technologies in use today.

What Do Nuclear Engineers Do?

Nuclear engineers apply engineering principles to nuclear systems throughout their lifecycle, from design to operation and decommissioning.

Common responsibilities include:

- Designing nuclear reactors, systems, and components
- Monitoring and controlling nuclear reactor operations
- Analyzing radiation levels and shielding requirements
- Developing safety procedures and emergency response plans
- Managing nuclear fuel use and radioactive waste
- Conducting simulations and performance analyses
- Ensuring compliance with regulatory and safety standards

Areas of Nuclear Engineering

Nuclear engineers often specialize in specific applications:

- Nuclear Power Generation: Designing and operating reactors for electricity production.
- Radiation Applications: Using nuclear technology in medicine, industry, or research.
- Nuclear Safety and Regulation: Analyzing risks and enforcing safety standards.
- Fuel Cycle Engineering: Managing nuclear fuel processing, use, and disposal.
- Defense and National Security: Supporting naval propulsion or deterrence systems.
- Research and Development: Advancing next-generation nuclear technologies.

Skills and Abilities Needed

Nuclear engineers combine advanced technical expertise with rigorous safety awareness.

Core Professional Skills

Personal Qualities That Matter

Education and Training Pathway

Becoming a nuclear engineer requires rigorous formal education:

- Bachelor's Degree: In nuclear engineering or a closely related engineering field
- Advanced Mathematics and Physics Coursework: Core foundation of the discipline
- Internships or Co-op Programs: Hands-on experience in nuclear facilities or labs
- Master's Degree (common): Often required for advanced or research roles
- Security Clearance (some roles): Required for government or defense positions

Where Do Nuclear Engineers Work?

Nuclear engineers are employed across energy, research, and defense sectors:

- Nuclear Power Plants and Utilities

- Government and Regulatory Agencies
- Defense and Naval Propulsion Programs
- Research Laboratories and Universities
- Medical and Industrial Technology Companies
- Energy and Advanced Reactor Firms

Work environments are typically office-based, laboratory-focused, or within highly controlled facilities.

How Much Do Nuclear Engineers Earn?

Earnings vary by sector, specialization, and experience:

- Entry-Level Nuclear Engineers: Typically earn strong engineering salaries
- Experienced or Licensed Engineers: Often earn higher pay with responsibility
- Senior or Specialized Engineers: May earn more in leadership or highly regulated roles

Compensation often reflects the technical complexity and safety responsibility of the work.

Is This Career Difficult?

Nuclear engineering is highly demanding intellectually and carries significant responsibility. Engineers must work with systems where safety is paramount and errors can have serious consequences. The challenge lies in mastering complex physics, adhering to strict regulations, and maintaining flawless operational standards.

Who Should Consider Becoming a Nuclear Engineer?

This career may be a strong fit if you:

- Enjoy advanced math, physics, and engineering
- Are detail-oriented and safety-focused
- Like working on critical infrastructure systems
- Are comfortable with regulation-heavy environments
- Want to contribute to energy, medicine, or national security

How to Prepare Early

- Take advanced math, physics, and chemistry courses
- Study engineering fundamentals and thermodynamics
- Learn computational modeling and simulation tools
- Explore nuclear energy, radiation science, or reactor concepts
- Research accredited nuclear engineering programs and internships

Nuclear engineers manage some of the most powerful forces used by humanity, turning advanced science and rigorous safety into reliable energy, medical innovation, and national security through precision, discipline, and engineering excellence.