WHAT CAN I DO WITH A MAJOR IN … NUCLEAR ENGINEERING

OCCUPATIONAL SUMMARY:
Conduct research on nuclear engineering problems or apply principles and theory of nuclear science to problems concerned with release, control, and utilization of nuclear energy and nuclear waste disposal.

EMPLOYMENT REQUIREMENTS: Considerable Job Preparation Needed
A bachelor's degree is the minimum formal education required. However, many employers also require graduate school and some require a Ph.D., M.D., or J.D. (law degree).

EMPLOYERS & SUGGESTED STRATEGY:
Please ask your Career Advisor (CDF) for identifying employers or additional resources for your occupation of choice.

Business services including medical industry - Defense manufacturers - Electric and gas utility companies - Engineering consulting firms - Guided missile and space vehicle companies - Manufacturers of nuclear power equipment - Military services - Research facilities

Suggested Strategy: Take additional courses in area(s) of interest. Keep pace with technology and military/defense innovations. Develop strong interpersonal and communication skills.

A DAY IN THE LIFE:
Like most engineers, nuclear engineers spend their time working in large, hi-tech environments. Employment in nuclear engineering is divided equally between the Federal Government, utilities companies, and the research and testing units of defense and engineering companies. The Navy, with its fleet of nuclear-powered ships, is a large employer of nuclear engineers, as is the Nuclear Regulatory Commission. Nuclear engineers conduct research for utility companies to optimize the performance of existing plants, and they are employed in atomic research facilities like the Los Alamos National Laboratory and the Stanford Linear Accelerator Center. Nuclear engineering has become increasingly important in the development of new medical scanning technologies one of the few growing segments of the field. These employers are all large, established operations. The research side of nuclear engineering can be extremely creative, but the field is best suited for those who won't feel confined in large, bureaucratic work environments. Nuclear engineers work in extended teams, and caution and risk control are the bywords of the industry—appropriately so, given the dangers of nuclear radiation. With the exception of radio-medical, nuclear disposal, and theoretical atomic research, a small percentage of total employment in the field, nuclear engineering is not a field marked by breakthroughs. The halt in new power plant construction has ended all but incremental, evolutionary nuclear power research, and atomic weapons design, once a booming experimental field, has lost much of its funding in the 1990s. The field does, however, offer extremely stable, secure, and well-paying professional employment.

PAYING YOUR DUES:
Graduate education is a prerequisite for employment as a design or research nuclear engineer. Engineers must have at least a master's degree, which involves significant work in math, physics, and engineering design, while both private and government research jobs often require that the applicant have completed a doctorate in nuclear engineering. Typically, the educational requirements for an operating engineer are less rigorous: A bachelor's degree in nuclear engineering is one qualification, while others with only high school diplomas get their training through the U.S. Navy Nuclear Power Plant Program.

TASKS • KNOWLEDGE • SKILLS • ABILITIES

Tasks
• Perform experiments that will provide information about acceptable methods of nuclear material usage, nuclear fuel reclamation, and waste disposal.
• Design and oversee construction and operation of nuclear reactors and power plants and nuclear fuels reprocessing and reclamation systems.
• Design and develop nuclear equipment such as reactor cores, radiation shielding, and associated instrumentation and control mechanisms.
• Examine accidents in order to obtain data that can be used to design preventive measures.
• Monitor nuclear facility operations in order to identify any design, construction, or operation practices that violate safety regulations and laws or that could jeopardize the safety of operations.

Knowledge

**Engineering and Technology** — Knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.

**Mathematics** — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.

**English Language** — Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

Skills

**Active Listening** — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

**Critical Thinking** — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Quality Control Analysis** — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

**Judgment and Decision Making** — Considering the relative costs and benefits of potential actions to choose the most appropriate one.

**Operation Monitoring** — Watching gauges, dials, or other indicators to make sure a machine is working properly.

**Learning Strategies** — Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

**Mathematics** — Using mathematics to solve problems.

Abilities

**Problem Sensitivity** — The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

**Written Comprehension** — The ability to read and understand information and ideas presented in writing.

**Deductive Reasoning** — The ability to apply general rules to specific problems to produce answers that make sense.

**STATE & NATIONAL WAGES (2007):**

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**STATE & NATIONAL EMPLOYMENT TRENDS:**

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**INFORMATIONAL WEBSITES:**

online.onetcenter.org/  www.acinet.org/  www.princetonreview.com