



WHAT CAN I DO WITH A MAJOR IN ... **ELECTRICAL ENGINEERING**

OCCUPATIONAL SUMMARY:

Design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.

EMPLOYMENT REQUIREMENTS:

Considerable Job Preparation Needed

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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.

Consulting firms - Federal government including: Armed forces, National Aeronautics and Space Administration (NASA), National Institutes of Health, Bureau of Standards, Department of Defense, Various commissions - Manufacturing firms and industry including: Aeronautical/Aerospace, Automotive, Business machines, Professional and scientific equipment, Consumer products, Chemical and petrochemical, Computers, Construction, Defense, Electric utilities, Electronics, Environmental, Food and beverage, Glass, ceramics, and metals, Machine tools, Mining, Nuclear, Oceanography, Pulp and paper, Textiles, Transportation, Water and wastewater - Public utilities

Suggested Strategy: Develop effective verbal and written communication skills. Gain experience in team work. Acquire capacity for details. Develop interpersonal skills. Obtain research experience.

A DAY IN THE LIFE:

From radar to motors, electrical engineers design, implement, maintain, and improve all the electronics everyone uses everyday. "Most EEs love to talk about technology," mentioned one, "and that is a wonderful thing." Many engineers enter the profession for the intellectual stimulation and are generally driven people who aim to strike a balance between competition and mutual support. Over 85 percent of the EEs we surveyed cited interaction with their peers as the most positive aspect of the profession. Daily activities include studying technical manuals, articles, and other publications; designing, testing, and assembling devices; and writing reports and keeping track of various assignments. Computer skills are a must. Over 40 percent of the time is spent attending meetings, working on strategic planning, and tracking projects. The amount of interpersonal communication can be disconcerting to many project-oriented engineers; over 15 percent of newly hired EEs take in-house management organization or writing skills courses. Contact between professionals and clients is infrequent. This sense of "project vs. product" isolation actually seems to be valuable. Beyond designing and creating new circuits for televisions, VCRs, slot machines, or stereo equipment, engineers with creative instincts usually flock to more esoteric, unproved areas such as cutting-edge medical technology and HDTV. Specialization is important and happens quickly, with engineers moving into such areas as quantum electronics, acoustics, signal processing, and ferroelectrics. EEs must have patience; the average span of time from the design of a product to placement on a shelf is two years.

PAYING YOUR DUES:

An undergraduate degree in electrical engineering will suffice for most entry-level positions, such as tester and data collector, but an M.S. or Ph.D. will be necessary for those who intend to progress further. Coursework includes physics, chemistry, some biology, heavy mathematics and statistics. The defense industry provides a large portion of the job market for aspiring electrical engineers, so passing a security check may be required. The aviation industry provides another sizable segment of jobs. Candidates should be familiar with production, testing, and assembly of electronics components, the general methods and means of power transference, and, if possible, computer electronic modeling. Aspiring EEs who want to work for large corporations should be willing to follow already established procedures and protocols. Some of the most exciting and revolutionary innovations come out of smaller companies.

TASKS ▪ KNOWLEDGE ▪ SKILLS ▪ ABILITIES

Tasks

- Confer with engineers, customers, and others to discuss existing or potential engineering projects and products.
- Design, implement, maintain, and improve electrical instruments, equipment, facilities, components, products, and systems for commercial, industrial, and domestic purposes.
- Operate computer-assisted engineering and design software and equipment to perform engineering tasks.
- Direct and coordinate manufacturing, construction, installation, maintenance, support, documentation, and testing activities to ensure compliance with specifications, codes, and customer requirements.

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.

Computers and Electronics — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

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.

Design — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.

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.

Troubleshooting — Determining causes of operating errors and deciding what to do about it.

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

Reading Comprehension — Understanding written sentences and paragraphs in work related documents.

Technology Design — Generating or adapting equipment and technology to serve user needs.

Complex Problem Solving — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

Active Learning — Understanding the implications of new information for current and future problem-solving and decision-making.

Abilities

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

Near Vision — The ability to see details at close range (within a few feet of the observer).

STATE & NATIONAL WAGES:

	10 %	25 %	Median	75 %	90 %
New Mexico	\$ 52,900	\$ 63,600	\$ 77,200	\$ 91,400	\$ 109,500
United States	\$ 47,100	\$ 57,100	\$ 70,800	\$ 87,500	\$ 106,400

STATE & NATIONAL EMPLOYMENT TRENDS:

	Actual Employment 2002	Forecasted Employment 2012	Percentage Change	Average Annual Job Openings
New Mexico	2,900	3,080	+ 6 %	80
United States	155,700	159,600	+ 2 %	3,450

INFORMATIONAL WEBSITES:

