

ELECTRICAL ENGINEER JOBS AND CAREERS AND JOB DESCRIPTION

From radar to motors, electrical engineers design, implement, maintain, and improve all the electronics everyone uses everyday. Their work requires them to play with toys, to model, to develop and design products, and to have creative, intellectual discussions. "Most EEs love to talk about technology," mentioned one, "and that is a wonderful thing." Many engineers enter the profession for the intellectual stimulation. Electrical engineering isn't just a profession; it's a way of thinking and solving problems. Electrical engineers are a group of generally like-minded, similarly driven people who 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 thing about the profession. Engineers rely heavily on this sense of community and friendly discourse to buoy them up in times of long hours and hard work.

Daily activities include reading 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. Much of the most difficult work EEs do takes place in the brain, not in discussion with clients.

Most jobs involve large-scale electrical problems, such as 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 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.

How to Become an Electrical Engineer

An undergraduate electrical engineering degree will suffice for most entry-level positions, such as tester and data collector, but an MS or Ph.D. are necessary to progress further. Coursework includes physics, chemistry, some biology, mathematics, statistics, and materials science. Note that the defense industry provides a large portion of the job market for aspiring electrical engineers, so passing a security check may be important. 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.

Associated Careers

Those who choose to become electrical engineers usually do so for life. The fewer than 5 percent who leave mostly become physicists, electricians, aviation engineers, or computer scientists. A number of former electrical engineers head to Wall Street, where intellectual acuity is rewarded on a slightly higher salary scale.

Electrical Engineer Job Prospects

The profession of electrical engineer appeared when Alessandro Volta harnessed electric energy at the end of the eighteenth century. The field expanded with the discovery of electromagnetic fields and Michael Faraday's developing a way to use them to generate a current, in 1837. Scientists and electrical engineers, including Thomas Edison, Samuel Morse and Alexander Graham Bell, made significant advances in utilizing these forces. A more contemporary round of revolutionary changes occurred with the invention of the microchip in the 1960s, giving rise to the modern personal computer. During the 1950s, 1960s and 1970s, most major EE advances emerged out of defense-industry sponsored research. In the 1980s and 1990s, that trend seems to have reversed, with the most significant advances coming from the private sector.

The future of electrical engineering is certain in only one respect: There will continue to be a great demand for electrical engineers. Product development is becoming more and more closely tied to the use of the microchip. It is estimated that of the \$17 billion annually spent in the U.S. on research and development, over \$7 billion will in some way involve work done by electrical engineers.

Quality of Life

Two Years Out

"Thrown out of the frying pan and into the fire," said two of our respondents about their initial years in electrical engineering. The pay is reasonable but the hours are long, and those used to working in an academic community where deadlines are flexible, and professors accommodating, find the transition jarring. A good 20 percent change jobs in their first three years, trying to find the match for their own personal working style. Work is highly supervised and highly compartmentalized; expect to be unable to distinguish yourself for the first two years, since you will be buried in the details of modeling, computer analysis, and drafting.

Five Years Out

Specialization takes place between years three and five. Many move from "assistant" to "designer" or "quality control" areas. Pay and responsibility increase. Playing the corporate game is crucial for those who remain at large firms. Contacts made early on are very important for those wishing to form start-up companies on their own. Just ten percent change occupations within the industry if there exists even a remote chance at advancement in the current firm.

Ten Years Out

Almost 35 percent of electrical engineers control equity stakes in their firms, have filed for their own patents, or have started their own companies. The difficulty of rising in the corporate firmament induces many to become their own bosses. A significant number of ten-year veterans become upper management and direction guiders within their own company. Electrical engineers spend more time forming budgets, allocating resources, and overseeing production than designing, drafting, modeling and testing. Ten years is regarded by some as an enormously significant time frame in this profession; at this point, your academic education has been exploited to its fullest and the rapidly changing electronics industry requires that experience gained on the job be the equivalent of a contemporary degree. You must change with the changing technological world, or be left behind.

Professional Profile

| | |
|----------------------------|---------|
| # of people in profession: | 370,000 |
| % male: | 90 |
| % female: | 10 |
| average hours per week: | 43 |

Professionals Read

IEEE
CEE
IEC Quarterly
Spectrum

Books, Films and TV Shows Featuring the Profession

Short Circuit
Building Jerusalem
The Lighting of New York

Major Employers

| | | |
|---|---|---|
| Ademco (Alarm Device Manufacturing Company) 178 Michael Drive Syosset, NY 11791 Tel: 516-921-6704, x2250 | Anacomp Inc. P.O. Box 509005 San Diego, CA 92150 Tel: 619-679-9797 x5608 | Autocon Industries Inc. 995 University Avenue St. Paul, MN 55104 Tel: 612-642-2967 |
|---|---|---|

Fax: 516-364-0746
Contact: Employment Manager

Fax: 619-748-9482
Contact: Mr. G. B. Armstrong

Fax: 612-642-1784
Contact: Mary L. Huber

You'll Have Contact With

Computer Programmers
Electricians
Production Managers
Technicians

Major Associations

American Electronics Association
5201 Great America Parkway
Suite 520
Santa Clara, CA 95054
Tel: 408-987-4200
Contact: Customer Service Department

| | |
|-----------------------------------|---|
| Electronic Industries Association | Institute of Electrical and Electronics Engineers |
| 2500 Wilson Boulevard | 1828 L Street, NW |
| Arlington, VA 22201 | Suite 1202 |
| Tel: 703-907-7500 | Washington, DC 20036-5104 |
| Fax: 703-907-7501 | Tel: 202-785-0017 |

<https://blog.granted.com/>