

Construction and Extraction

Electricians

Electricians install and maintain all of the electrical and power systems for our homes, businesses, and factories. They are responsible for installing and maintaining the wiring and control equipment through which electricity flows. They also install and maintain electrical equipment and machines in factories and in a wide range of other businesses. Electricians generally focus on either construction or maintenance, although many do both. Electricians specializing in construction primarily install wiring systems into factories, businesses, and new homes. Electricians specializing in maintenance fix and upgrade existing electrical systems and repair electrical equipment. All electricians must follow state and local building codes and the National Electrical Code when performing their work.

Electricians usually start their work by reading blueprints- technical diagrams that show the locations of circuits, outlets, load centers, panel boards, and other equipment. After determining where all the wires and components will go, electricians install and connect the wires to circuit breakers, transformers, outlets, or other components and systems. When installing wiring, electricians use hand tools such as conduit benders, screwdrivers, pliers, knives, hacksaws, and wire strippers, as well as power tools such as drills and saws. Later, they use ammeters, ohmmeters, voltmeters, harmonics testers, and other equipment to test connections and ensure the compatibility and safety of components.

Maintenance electricians repair or replace electric and electronic equipment when it breaks. They make needed repairs as quickly as possible in order to minimize inconvenience. They may replace items such as circuit breakers, fuses, switches, electrical and electronic components, or wire. Electricians must periodically inspect all equipment to ensure that it is operating properly and to correct problems before breakdowns occur.

Maintenance work varies greatly, depending on where an electrician works. Electricians who focus on residential work perform a wide variety of electrical work for homeowners. They may rewire a home and replace an old fuse box with a new circuit breaker box to accommodate additional appliances, or they may install new lighting and other electric household items, such as ceiling fans. These electricians might also do some construction and installation work. Electricians in large factories usually do maintenance work that is more complex. These kinds of electricians may repair motors, transformers, generators, and electronic controllers on machine tools and industrial robots. They often advise management as to whether the continued operation of certain equipment could be hazardous.

Their work week is usually flexible and hours vary depending on the number of their clients. Almost all work is done on foot and climbing may sometimes be involved when installing lighting fixtures. Night and weekend hours may be necessary, especially when they are called in on emergency jobs.

Education/Training

How to Obtain:

Generally a High School Diploma or equivalent is needed, and many workers also have a technical certificate from a vocational school, or through an Associate's degree program. Many individuals learn on the job as helpers or laborers. Another option is to join an apprenticeship program, which typically lasts 3 to 4 years. Apprenticeships can usually be located through local unions, contractors, or professional associations such as Independent Electrical Contractors and the National Joint Apprenticeship Training Committee. In the classroom, apprentices learn:

- Electrical theory
- Blueprint reading
- Mathematics, electrical code requirements
- Safety and first aid practices
- They also may receive specialized training in soldering, communications, fire alarm systems, cranes and elevators

To become an apprentice the requirements are as follows:

- Minimum age of 18
- High School Education
- One Year of High School Algebra
- Qualifying Score on an Aptitude Test
- Drug Free

Most states require that electricians have a license in order to practice their trade. In New York one can apply to become a certified electrician. This is typically done after several years of working as a journeyman electrician. Persons finishing a traditional apprenticeship generally are recognized as journeyman electricians. In New York the licensing is done by cities rather than a state wide licensing process. Licensing information can often be found through City's Department of Buildings, Public Works or in the building code.

Typical requirements for local licensing include:

- A passing test score on the required examination

- 1 passport photo
- Complete Licensing application showing 7 and a half years of experience
- Official itemized statement of earnings from the Social Security Administration, showing the last 10 years of earnings
- Copies of W2 forms for any employers not listed on the SSA statement of earnings
- A letter from each employer listed on the application verifying employment dates and the nature of your work
- Official school transcripts from any college or trade school in which electrical related courses were taken

Electricians can become electrical contractors. Contractors must acquire a license but licensing requirements vary. Some requirements may include:

- Business and Law exam
- Taking a specialty exam
- A Specific number of years of experience

More Information on Licensing, Certification and Apprenticeship Programs:

- New York City Licensing Checklist:
http://www.nyc.gov/html/dob/downloads/pdf/elec_lic_checklists.pdf
- Cedia Electronic Systems Contractors State Licensing Directory:
http://www.cedia.net/pdf/CEDIA_state_licensing_Final.pdf
- Rochester:
<http://www.cityofrochester.gov/article.aspx?id=8589939642>
- Syracuse:
<http://www.syracuse.ny.us/pdfs/2/Electrical%20License%20Application.pdf>
- Albany:
<http://www.ecode360.com/?custId=AL0934>
- Independent Electrical Contractors Apprenticeships:
<http://www.ieci.org/index.mv?screen=BecElect&xsub=1>
- National Joint Apprenticeship Training Committee:
<http://www.njatc.org/training/apprenticeship/index.aspx>
- Contractors' License Information:
<http://www.contractors-license.org/>

Average Costs:

Apprenticeship programs generally do not charge the apprentice for classroom instruction, provided the apprentice maintains employment with a contractor affiliated with the apprenticeship program, throughout the apprenticeship period of 3 to 4 years.

Licensing costs vary by state or city. In NY State total costs are \$310* paid when the license is issued in addition to a \$50 fee. Additional fees may apply at the city level. Rochester for example has a \$60 application form fee and a \$70 fee payable to the exam administrators.

*Note: Costs of continuing education and license renewal may vary.