

# Electrician

## At a Glance

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*Electricians install and fix electrical systems in new homes, offices, and factories. Some maintain the machines and electrical systems in buildings.*

### 16 Career Clusters

Architecture & Construction

Manufacturing

Transportation, Distribution & Logistics

### Earnings

**Earnings Range:** 14 - 39/hr

### Level of Education

- 2-Year College or Technical Training

### Core Tasks

- Read blueprints and understand building codes
- Install electrical wiring in buildings
- Connect wiring to control panels and electricity sources
- Install electrical control devices such as switches and outlets
- Maintenance electricians maintain the electrical systems of industrial machines

### Attributes & Abilities

- Mechanically inclined with an aptitude for math
- Analytical approach to problem-solving
- Physical strength
- Hand-eye coordination
- Good eyesight and color vision

### Workplace

- Work for electrical contracting companies, industrial plants, and construction companies, or are self-employed
- Work in homes, on construction sites, in factories, and in electrical utility stations
- There is some danger of electrical shocks
- Most work a 5-day, 40-hour week, but overtime is sometimes necessary
- Maintenance electricians may often work evenings and weekends

## Job Description

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Many parts of our lives depend on electricity. Without it, our lights, computers, and TVs just won't work. Electricians install and fix these electrical systems so that we are never left in the dark.

Electricians install the electrical systems in all kinds of places. They may also help design and lay out these systems in new structures. Most people in this field work in construction. They put in and fix the systems in new homes and buildings. In the industrial sector, they take care of the machines and systems in factories.

In construction, electricians are in charge of wiring new buildings. They follow blueprints and building codes to make sure they use the right wires. They run wires from control panels all over the building. They also put in the light switches and outlets.

Maintenance electricians work mostly in factories. They connect and maintain the electrical systems of industrial machines. People in this sector try to prevent machines from breaking down. A breakdown can be very costly for the company. These electricians are often on call. They are expected to come in to work if there are any issues with the system.

Electricians test all their work to prevent fires and shocks. They use special tools to make sure the work meets local safety standards. These tools include ohmmeters, voltmeters, and oscilloscopes.

These tradespeople can work for contractors or construction companies. Some of them work for companies that need in-house services. Many of them work as independent contractors. They travel to serve clients in their homes and offices.

## Working Conditions

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Electricians can work in or on:

- clients' homes
- construction sites
- factories
- electrical utility stations

They may have to bend or squat for long periods to work on wiring that is hard to reach. Electrical shocks are a hazard of the job. Tradespeople follow safety rules so there won't be many accidents.

Most people in this field work around 40 hours a week. Independent contractors may work 12 to 14-hour days, or 60 to 70 hours a week. Maintenance electricians may work nights and on the weekend. They may also get called in to work without much notice.

The amount of work electricians get depends on how the construction industry is doing. If the economy has slowed down, there is a decreased demand for this type of work.

## Earnings

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Most electricians work full time for companies. Some are self-employed and run their own companies. They may work on their own, or have a few employees.

In general, people in this field can earn from \$32,000 to \$90,000 a year. The median income is about \$53,000 year. Contractors with their own businesses can earn over \$90,000 a year. Earnings depend on a number of factors. These can include the employer, industry, and level of experience.

Apprentices earn less than fully qualified electricians during their training period. Usually, they start out earning about 40 to 50% of an electrician's wage. They get paid more for each year of their training.

Depending on where they work, full-time electricians may get benefits as well. These can include paid sick days and health coverage. Self-employed electricians must provide their own benefits.

Some electricians belong to unions. Union leaders negotiate the wages and benefits on behalf of the whole group.

### Massachusetts Wages

**Occupation:** Electricians

Level of Experience	Hourly	Annual
Entry Wage	\$23.63	\$49,160

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Median Wage	\$30.19	\$62,800
Experienced Wage	\$40.3	\$83,820

**Source:** U.S. Department of Labor, Bureau of Labor Statistics <http://www.bls.gov>

## Massachusetts Outlook

**Occupation:** Electricians

### Employment

2014	15,700
2024	16,290

### Change

Number	590
Percentage	3.7

### Annual Average Openings

Total	Growth	Replacement
300	--	--

**Source:** Projections Central <http://www.projectionscentral.com>

## Education

You'll need some training to work as an electrician. Most people get their training from apprenticeship programs. These programs take about 4 years to complete. They include both classroom lessons and on-the-job training. You will likely need a high school diploma to apply.

Many apprenticeships are offered by unions and trade associations. Some large employers may also be able to train you. However, this option is less common.

You may want to take some other training before you enter an apprenticeship. Technical schools and 2-year colleges offer a range of courses and programs. You can study electricity or a related area. This extra training is not required. But, it may give you an edge when you apply to an apprenticeship program.

In most states, electricians are required to be licensed. Exact licensing criteria vary from area to area. However, you will likely need to pass an exam. Local employers, unions, and trade groups can tell you more about the training.

### Related College Programs

- Electrician

- Electrical and Power Transmission Installation/Installer, General
- Lineworker
- Construction Trades, General

### Other Suggested Qualifications

High school courses in math, electronics, mechanical drawing, science, and shop provide a good background. Electricians should have mathematical and mechanical aptitudes, and an analytical approach to problem-solving. They should also understand computerized machinery and be efficient with hand tools. Those who work in homes or businesses must be neat and able to deal with customers courteously. Electricians must also be able to read and interpret drawings and electrical code specifications. Other important characteristics include physical strength, manual dexterity, good hand-eye coordination, and the ability to work at heights. Since electrical wires are color-coded, good eyesight and color vision are vital. To remain competitive in this field, electricians should be willing to upgrade their skills continually

### Sample High School Program of Study

This Program of Study can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner’s educational and career goals.

### Construction Architecture & Construction

Grade 9	Grade 10	Grade 11	Grade 12
<b>English/Language Arts</b>			
English/Language Arts I	English/Language Arts II	English/Language Arts III Technical Writing	English/Language Arts IV
<b>Math</b>			
Algebra I	Geometry	Algebra II	Construction Math Statistics
<b>Science</b>			
Earth or Life or Physical Science	Biology	Physics	Chemistry
<b>Social Studies/Sciences</b>			
State History Civics or World History	U.S. History	Economics Psychology	
<b>Career &amp; Technical Courses</b>			

Grade 9	Grade 10	Grade 11	Grade 12
Introduction to the Built Environment	The Language of Architecture and Construction  Information Technology Applications	Safety, Health and the Workplace Environment  Principles of Construction	Applications in Construction

States' Career Clusters Initiative, 2008, [www.careerclusters.org](http://www.careerclusters.org).

### Important

- Check with your advisor to make sure that your course selections satisfy your graduation requirements.
- Courses available may vary from school to school.

## Sample Career Path

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People take different pathways through their careers, but no one starts at the top. This is an example of how the earnings, education and experience requirements, and responsibilities might progress for someone in this occupation.

### Level 1

<b>Sample Title</b>	First-Year Apprentice
<b>Earnings</b>	\$12 to \$15 an hour
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• High school diploma</li> <li>• Some commonly used tools</li> <li>• Pass an aptitude test and interview</li> </ul>
<b>Responsibilities</b>	Working under a journeyman; doing odd jobs while learning the trade (for example, loading and unloading materials, and cleaning up); taking courses.

### Level 2

<b>Sample Title</b>	Second, Third, and Fourth-Year Apprentice
<b>Earnings</b>	\$15 to \$20 an hour
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Be in the process of completing the required number of hours of on-the-job and classroom training</li> </ul>
<b>Responsibilities</b>	Responsibilities increase with each year. Duties include installing cables, conduits, panels, motors, outlets, and lighting fixtures; testing electrical equipment under a journeyman.

### Level 3

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### Level 3

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<b>Sample Title</b>	Journey-level Electrician
<b>Earnings</b>	\$15 to \$28 an hour
<b>Requirements</b>	<ul style="list-style-type: none"><li>• Successful completion of the apprenticeship program</li><li>• Passing the licensing exam</li><li>• Provision of your own tools</li></ul>
<b>Responsibilities</b>	Installing electrical materials and apparatus; connecting electrical equipment; testing, certifying, and troubleshooting electrical systems; maintaining and servicing electrical equipment.

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### Level 4

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<b>Sample Title</b>	Independent Electrical Contractor
<b>Earnings</b>	\$25 to \$37 an hour
<b>Requirements</b>	<ul style="list-style-type: none"><li>• Training and many years of experience as an established electrician</li><li>• Business management skills and knowledge</li><li>• Computer skills</li></ul>
<b>Responsibilities</b>	Managing a group of electricians; job estimating; getting materials; designing electrical systems; overseeing installation and maintenance of electrical equipment and systems; invoicing and serving customers.

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## Related Careers

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Here are some other occupations that you might be interested in. Click on an occupation name to learn more.

- Appliance Repairer
- Broadcast Technician
- Building Inspector
- Cable Installer and Repairer
- Carpenter
- Construction Tradesperson
- Electrical Engineer
- Electrical Engineering Tech
- Electronics Repairer
- Elevator Installer and Repairer
- Energy Auditor
- Heating, Air Conditioning, Refrigeration Tech
- Home Inspector
- Industrial Machinery Mechanic
- Lineworker
- Plumber
- Security Systems Technician
- Solar Energy Tech

## Related Military Careers

- Building Electrician

- Power Plant Electrician
- Ship Electrician

## Career Clusters

Career Clusters are groups or families of occupations that share common characteristics such as knowledge requirements, skill sets, and/or goals.

Architecture & Construction

Manufacturing

Transportation, Distribution & Logistics

## National Employment by Industry

Industry	% Employed
Construction	66
Self-Employed	10

Source: O\*Net Online, Browse by Industry, US Department of Labor  
<http://online.onetcenter.org/find/industry>

## Other Resources

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### Independent Electrical Contractors (IEC)

A trade association for electrical contractors. Click on Become An Electrician to find out about apprenticeship opportunities, school programs, and more.

<http://www.ieci.org>

### National Electrical Contractors Association (NECA)

NECA is a national organization representing electrical contractors. Scroll over Professional Development and click on Careers In Electrical Contracting to find out more about becoming an electrician or electrical contractor.

<http://www.necanet.org>

### Building Advantage – Apprenticeship Program

This organization aims to raise awareness about construction and trade unions. Here you can find excellent career videos to help you learn more about a variety of careers.

<http://www.buildingadvantage.org/apprenticeship>

### International Brotherhood of Electrical Workers (IBEW)

This union represents workers in a variety of fields, including utilities and construction. Scroll over Tools to find the Local Union Directory.

<http://www.ibew.org>

### Haynes Electric Construction Company

Find out more about the qualities you need to succeed as an electrician!

<http://hayneselectric.wordjack.com/business/5-personality-traits-good-electrician>

**Choose Construction**

This is a career and education guide for students focusing on the construction industry in the US. Click on Career Options to discover different careers.

<http://www.chooseconstruction.org>

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**ConstructMyFuture.Com**

This is a career and education guide focusing on the construction industry. Click on Jobs to discover different careers.

<http://www.constructmyfuture.com/students>

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**Home Builders Institute (HBI)**

HBI provides training for careers in the building industry. Scroll over Programs and click on Career & Certification Services to learn more about the services they offer.

<http://www.hbi.org>

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**United States Department of Labor – Employment & Training Administration**

Visit this website to learn more about apprenticeships. Search the site for more information on apprenticeship opportunities.

<http://www.doleta.gov/oa>

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**Occupational Outlook Handbook – Electricians**

Career information from the US Department of Labor.

<http://www.bls.gov/ooh/Construction-and-Extraction/Electricians.htm>