

# ELECTRICAL ENGINEER

ALSO KNOWN AS: **CONTROLS ENGINEER** **TEST ENGINEER**

## SPARK YOUR CAREER.

Illuminate the future as an Electrical Engineer, where your ideas will power the world and electrify innovation.

### KEY SKILLS

Skills which may benefit anyone considering a job as a electrical engineer include:

- ☑ Knowledge of programming languages
- ☑ Process Analysis
- ☑ Knowledge of power systems
- ☑ Circuit design
- ☑ CAD software proficiency

### CAREER PROGRESSION

In this role, you may have the opportunity to progress to other positions. Career progression opportunities include:

- Chief Executive Officer
- Chief Financial Officer
- Chief Engineering Officer

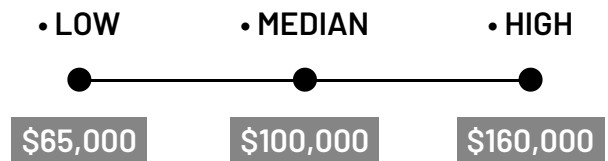
### VALUES & ATTRIBUTES

Values and attributes of anyone considering a job as a electrical engineer include:

- ☑ Precision
- ☑ Safety-conscious
- ☑ Team Player
- ☑ Innovative
- ☑ Adaptable
- ☑ Investigative – “Thinker”

### SALARY EXPECTATION

The expected salary for an Electrical Engineer can vary across different areas of manufacturing and may vary as you become more experienced.



### RELATED INDUSTRIES

- ▶ Aerospace and Defence
- ▶ General Manufacturing and Engineering
- ▶ Pharmaceutical and Medical Technology
- ▶ Transport Equipment and Machinery

### RECOMMENDED SCHOOL SUBJECTS

- Design
- Engineering Skills
- Mathematical Methods
- Physics
- Specialist Mathematics

### CORE SCHOOL SUBJECTS

- General Mathematics
- Essential English
- Engineering

## JOB OVERVIEW

Electrical Engineers are the driving force behind the systems that generate, distribute, and utilise electrical power. They design, develop, test, and supervise the manufacturing of electrical equipment, from the smallest microchip to massive power station generators. Their work touches nearly every aspect of modern life, from smartphones and computers to renewable energy systems and electric vehicles.

These professionals blend creativity with technical expertise to solve complex problems and push the boundaries of technology. Electrical Engineers work across various industries, including telecommunications, aerospace, automotive, and renewable energy, contributing to advancements that shape our increasingly connected and electrified world.

Electrical Engineers utilise a diverse set of tools and equipment in their daily work, including oscilloscopes for signal analysis, multimeters for electrical measurements, and specialized software for circuit simulation and PCB design. A typical day might involve using a logic analyser to debug a complex digital system, programming microcontrollers for an IoT device, and collaborating with software engineers on developing firmware for a new smartphone. These professionals work on a wide array of products and systems, from designing more efficient solar inverters and developing advanced battery management systems for electric vehicles to creating cutting-edge 5G communication infrastructure and innovating smart home automation technologies.

## WHAT WILL YOU DO?

Your role may include duties as follows:

1. Design and develop electrical systems and components
2. Create and interpret electrical schematics and technical drawings
3. Conduct tests and analyse electrical data
4. Ensure compliance with safety regulations and industry standards
5. Troubleshoot and resolve electrical system issues

## HOW TO BECOME A ELECTRICAL ENGINEER

Employers in the electrical engineering field typically look for candidates with a strong educational background and relevant experience. To become an electrical engineer, you typically require a bachelor's degree in a relevant field. Here are the steps to secure a job as a electrical engineer:

1. Earn a bachelor's degree in engineering majoring in relevant field
2. Apply to work as an intern, or directly with an employer
3. Develop a strong portfolio showcasing your projects and skills
4. Continue to grow your networks within the industry

# VOCATIONAL EDUCATION & TRAINING

While most engineering positions require a bachelor's degree, vocational education and training can provide a pathway and useful skills.

## PATHWAY THROUGH A TRADE

A trade certificate can be a valuable stepping stone towards university education, offering a unique blend of practical skills and industry knowledge. This pathway allows individuals to gain hands-on, real-world experience in their chosen field before transitioning to higher-level academic learning.

One trade pathway would be to undertake a Certificate III in Engineering – Electrical/Electronic Trade (MEM30405) as an apprenticeship. This qualification is designed for apprentices in the electrical/electronic engineering trade. It covers skills in electrical wiring, motors, generators, PLCs, and electronic controls

Post-trade qualifications are also available, including a Certificate IV in Engineering (MEM40119). This qualification is also undertaken as an apprenticeship.

Higher level vocational education and training can also offer foundation skills, and entry pathways to university. These qualifications include:

- Diploma of Engineering – Advanced Trade (MEM50119)
- Diploma of Engineering – Technical (MEM50222)
- Diploma of Engineering – Materials (MEM50522)
- Diploma of Engineering – Prototyping (MEM50522)
- Diploma of Engineering – Planning (MEM50522)
- Advanced Diploma of Engineering (MEM60122)
- Advanced Diploma of Engineering – Planning (MEM60322)

Advanced level vocational education and training qualifications can sometimes count towards or give you entry to a university degree.

# UNIVERSITY & HIGHER EDUCATION

Many universities offer cooperative education programs that combine classroom study with practical work experience in the aerospace industry. To become an Electrical Engineer, you typically need:

- A bachelor's degree in engineering with an electrical major
- Some positions may require or prefer a master's degree in engineering or a related field
- Ph.D. for research and development positions or university teaching roles

In addition to the core electrical engineering curriculum, students should consider specialising in emerging fields such as renewable energy systems, Internet of Things (IoT), or artificial intelligence. Courses in power systems, control theory, and digital signal processing are fundamental, while programming skills in languages like Python or C++ are increasingly valuable.

Many universities offer project-based learning opportunities, allowing students to work on real-world problems and develop practical skills. Participating in IEEE student chapters or electrical engineering competitions can provide networking opportunities and hands-on experience.

Some programs also offer dual degrees combining electrical engineering with computer science or biomedical engineering, preparing graduates for interdisciplinary roles in cutting-edge industries.