

# MECHATRONICS ENGINEER

ALSO KNOWN AS: ELECTRONICS ENGINEER ROBOTICS ENGINEER CODING AND ROBOTICS ENGINEER

## CREATE THE SMART MACHINES OF TOMORROW.

Fuse the future of technology as a Mechatronics Engineer, where mechanical precision meets electronic intelligence.

### KEY SKILLS

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

- ✔ Analytical skills
- ✔ Problem solving
- ✔ Process optimisation
- ✔ Programming
- ✔ Technical writing

### CAREER PROGRESSION

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

- Chief Operating Officer
- Chief Engineering Officer
- Chief Executive Officer

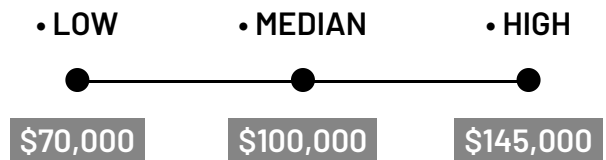
### VALUES & ATTRIBUTES

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

- ✔ Innovative
- ✔ Attention to detail
- ✔ Adaptable
- ✔ Logical
- ✔ Collaborative
- ✔ Investigative – “Thinker”

### SALARY EXPECTATION

The expected salary for a Mechatronics 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

- Engineering Skills
- Mathematical Methods
- Physics
- Specialist Mathematics

### CORE SCHOOL SUBJECTS

- General Mathematics
- Essential English
- Engineering

## JOB OVERVIEW

Mechatronics Engineers are at the forefront of the technological revolution, combining principles from mechanical, electrical, and computer engineering to design and develop intelligent systems and products. They create innovative solutions that integrate mechanical components with electronic controls and software, resulting in sophisticated automated systems and smart devices.

These versatile professionals work across various industries, including robotics, automation, aerospace, and manufacturing. Their expertise is crucial in developing everything from industrial robots and automated production lines to smart home devices and autonomous vehicles. Mechatronics Engineers play a vital role in advancing Industry 4.0 technologies, contributing to the development of cyber-physical systems that are shaping the future of industry and everyday life.

In their daily work, Mechatronics Engineers utilise a wide array of tools and technologies. They might use computer-aided design (CAD) software to design mechanical components, programming environments like MATLAB or Python for system modelling and control, and specialised robotics software for simulation and programming. A typical day could involve designing a new robotic arm for an automated assembly line, programming a microcontroller for an IoT device, and collaborating with a multidisciplinary team to integrate sensors and actuators into a smart prosthetic limb. These engineers often work on cutting-edge projects, from developing advanced driver-assistance systems for autonomous vehicles to creating sophisticated industrial automation solutions that enhance productivity and efficiency.

## WHAT WILL YOU DO?

Your role may include duties as follows:

1. Design and develop mechatronic systems and products
2. Integrate mechanical, electrical, and software components
3. Program and configure control systems and microcontrollers
4. Conduct system testing and troubleshooting
5. Collaborate with cross-functional teams on product development

## HOW TO BECOME A MECHATRONICS ENGINEER

Employers in this field typically look for candidates with a strong educational background and relevant experience. To become a Mechatronics Engineer, you typically require a bachelor's degree in a relevant area. Here are the steps to become a mechatronics engineer:

1. Earn a bachelor's degree in engineering majoring in mechatronics
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 skills useful to higher level application.

## 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. Otherwise, you might consider a Certificate III in Engineering – Mechanical Trade (MEM30219) or Certificate III in Engineering – Fabrication Trade (MEM31922).

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 a Mechatronics Engineer, you typically need:

- A bachelor's degree in engineering with a mechatronics 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 core mechatronics courses, students should focus on developing a strong foundation in mechanical engineering, electrical engineering, and computer science. Courses in robotics, control systems, and embedded systems are particularly valuable. Many programs offer opportunities to work on interdisciplinary projects, such as building autonomous robots or developing smart manufacturing systems. Participating in robotics competitions or hackathons can provide excellent hands-on experience and networking opportunities. Some universities also offer specialised tracks in areas like industrial automation, robotics, or IoT, allowing students to tailor their education to specific career goals. Pursuing internships or co-op placements with companies in the mechatronics field can provide invaluable real-world experience and potentially lead to job opportunities after graduation.