

Automation and Robotics in Manufacturing Engineering

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ABOUT THE STUDY

Manufacturing engineering is a field of engineering that is concerned with the design, development, and implementation of manufacturing processes and systems. The main objective of manufacturing engineering is to improve the efficiency and effectiveness of the manufacturing process by optimizing the use of resources such as materials, machines, and labor.

The role of a manufacturing engineer is to oversee the entire manufacturing process, from the design phase to the delivery of the finished product. They work closely with other engineers, designers, and production workers to ensure that the manufacturing process is as efficient and effective as possible.

One of the main responsibilities of a manufacturing engineer is to design and develop new manufacturing processes. This involves understanding the properties of the materials being used, the capabilities of the machines and equipment being used, and the requirements of the finished product. By carefully designing the manufacturing process, a manufacturing engineer can ensure that the product is produced with the highest quality and at the lowest cost.

Another key responsibility of a manufacturing engineer is to optimize the use of resources. This involves identifying opportunities to reduce waste and improve efficiency. For example, a manufacturing engineer may identify a way to use a particular material more efficiently, reducing the amount of waste generated during the manufacturing process. They may also identify ways to automate certain tasks, reducing the need for manual labor and improving the overall efficiency of the manufacturing process.

Manufacturing engineers also play an important role in ensuring that the manufacturing process is safe and environmentally friendly. They are responsible for ensuring that all equipment and processes meet safety standards, and they work to reduce the environmental impact of the manufacturing process by identifying and implementing sustainable practices.

In addition to these core responsibilities, manufacturing

engineers are also responsible for a wide range of other tasks. They may be responsible for overseeing the installation and maintenance of manufacturing equipment, managing production schedules and budgets, and developing training programs for production workers.

To be successful in the field of manufacturing engineering, it is important to have a strong understanding of engineering principles, as well as a deep understanding of the manufacturing process. Manufacturing engineers must also be able to work effectively with other engineers, designers, and production workers and they must be able to communicate complex technical information in a clear and concise manner.

There are a wide range of tools and techniques that manufacturing engineers use to optimize the manufacturing process. These include Computer-aided Design (CAD) and Computer-aided Manufacturing (CAM) software, statistical analysis tools, and simulation software. By using these tools, manufacturing engineers can test different manufacturing scenarios and identify opportunities to improve efficiency and reduce costs.

One of the key trends in the field of manufacturing engineering in recent years has been the adoption of automation and robotics. Advances in robotics technology have made it possible to automate many tasks that were previously done manually, such as welding, painting, and assembly. This has not only improved efficiency and quality, but it has also reduced the need for manual labor, which can be especially important in industries where labor costs are high.

Another trend in the field of manufacturing engineering is the use of additive manufacturing, also known as 3D printing.

Additive manufacturing involves building up a product layer by layer, using a computer-controlled process. This technology has the potential to revolutionize manufacturing by reducing the need for traditional manufacturing processes such as casting, molding, and machining. Additive manufacturing also allows for greater customization and flexibility, making it possible to produce products that are tailored to specific customer needs.

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