



eDynamicLearning

CAREER & ELECTIVE COURSES



Course Syllabus



Introduction to Manufacturing: Product Design & Innovation

Course Description

Think about the last time you visited your favorite store. Now picture the infinite number of products you saw. Have you ever wondered how those things made it to the shelves? Whether it’s video games, clothing, or sports equipment, the goods we purchase must go through a manufacturing process before they can be marketed and sold. In Introduction to Manufacturing: Product Design and Innovation, you will learn about different types of manufacturing systems as well as career opportunities, including engineers, technicians, and supervisors. As a culminating project, you will plan your own manufacturing process and create an entirely original product! If you thought manufacturing meant mundane assembly lines, this course will show you how exciting, creative, and practical this industry can be.

Course Code: EDL053

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Lesson 1: Introduction to Manufacturing

Lesson Summary

America has been called a land of consumers. Our society has become accustomed to the luxury of purchasing commodities from retail stores in a way that is convenient and affordable. Most of us don't take the time to think much past the checkout line, however. Where do these products come from exactly? Were they made in our country or shipped in from somewhere else entirely? What machines and equipment were used to make the items we purchase? Who are the people involved in manufacturing and assembling the finished goods that line the shelves of our favorite stores? This course will give you a behind-the-scenes look at the vast industry called manufacturing. In this lesson, you'll examine the basics of manufacturing, including a brief history and some of the basic processes and principles that work together to transform raw materials into useful and valuable commodities.

Learning Objectives

- Discuss the field of manufacturing, including disciplines within manufacturing—such as engineering, science, and technology—and how they work together toward an end.
- Describe manufacturing processes such as input, output, and feedback.
- Distinguish between different types of manufacturing methods and processes.
- List the steps in the risk-management process.



Lesson 2: Success in Manufacturing — Part 1: Soft Skills

Lesson Summary

After learning about the various processes involved in manufacturing, you may think that strength or attention to detail is the key to being a successful employee in the manufacturing industry. Many people are surprised to learn that some of the most important skills required in this field aren't at all physical in nature. In this lesson, you'll explore some of the "soft" skills that, when properly developed, can jump-start a career in manufacturing.

Learning Objectives

- Discuss regulations and expectations in the workplace.
- Demonstrate communication techniques necessary to succeed in manufacturing.
- Define work ethic.
- Use time-management techniques.
- Explain how negotiation affects conflict resolution.



Lesson 3: Success in Manufacturing — Part 2: Teamwork

Lesson Summary

Think back to a time when you were required to work alongside others to achieve a common goal. Perhaps it was a school project or an extracurricular activity, such as a sport. What challenges did you face together? Many people have experienced or witnessed conflicts with others when working in teams. These conflicts can damage relationships and keep the team from accomplishing its goals. When a team is dysfunctional at work, it can cost the company money, so good teamwork is particularly important in the workplace. In this lesson, you'll learn about some of the most important teamwork skills employees need to be successful on the job, particularly in the manufacturing industry.

Learning Objectives

- Describe how teams function together, solve problems, and measure results.
- Identify team roles.
- Discuss theories of motivation.
- Classify the stages of team development.



Lesson 4: Success in Manufacturing — Part 3: Manufacturing Applications (Hard Skills)

Lesson Summary

As you learned in the previous lessons, “soft” skills are those skills necessary to work well with people. People skills aren’t the only things to be concerned with in the manufacturing industry, however. Many employees who work in this field must operate machinery and equipment for manufacturing and assembling products. Others must develop strategies for manufacturing goods in a way that saves the company time and money. In this lesson, you’ll discover some of these “hard” skills that enable employees in the manufacturing industry to do their jobs effectively.

Learning Objectives

- Discuss roles and tasks common in the manufacturing industry.
- Describe quality and how it is measured in manufacturing.
- Explain how inventory is managed in the manufacturing industry.
- Evaluate different quality control applications in manufacturing.
- Define work systems design and human resource management.



Midterm Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first four lessons in this course (Note: You will be able to open this exam only one time.)



Lesson 5: Success in Manufacturing — Part 4: Engineering Applications (Hard Skills)

Lesson Summary

As you've learned, engineering and manufacturing are closely related fields. Engineers are those men and women who work behind the scenes studying the manufacturing process, choosing the best equipment and machinery for the job, and even designing new products. While some of the tasks may overlap, engineers typically need a different skill set than manufacturing employees do. In this lesson, you'll learn about some of those skills that help engineers do their jobs to the best of their abilities.

Learning Objectives

- Analyze engineering concepts.
- Describe and produce engineering drawings.
- Compare and contrast lean manufacturing and lean engineering.
- Define manufacturing engineering and systems engineering.



Lesson 6: Safety in Manufacturing

Lesson Summary

There are many advantages to working in the manufacturing industry, but one of the downfalls is the exposure to risks and hazards. Because of the heavy equipment involved, manufacturing is one of the most dangerous industries there is. Each year, many workers in this field are injured and even killed on the job. Because of these serious risks, government regulations have been put into place to keep manufacturing employees safe while at work. In this lesson, you'll examine some of the most important guidelines that employers must follow to protect the men and women who work for them.

Learning Objectives

- Discuss workers' rights.
- Evaluate hazards manufacturing employees face.
- Identify government regulations that protect workers in the manufacturing industry.
- Explain how to identify and dispose of hazardous material.



Lesson 7: Careers in Manufacturing

Lesson Summary

Over the duration of this course, you've learned about many different areas of manufacturing, from assembly line work to human resource management. Because the industry is so vast and complex, it offers many diverse career opportunities for potential employees. In this lesson, you'll explore some of those career opportunities. You'll also have the chance to develop some personal career goals of your own.

Learning Objectives

- Analyze the various specializations in manufacturing.
- Identify the education and training required for various careers in manufacturing.
- Report on a specific career in the manufacturing industry.
- Evaluate personal career goals.



Lesson 8: Culminating Manufacturing Project

Lesson Summary

Over the duration of this course, you've learned quite a bit about the manufacturing industry. In this lesson, you'll finally get to apply all that new knowledge to a project of your very own. If you've ever imagined inventing a new product, then you're in luck! For this manufacturing project, you'll be creating a new product from scratch, starting with the design and engineering process. You'll get to choose how your product is manufactured and even develop a marketing plan for selling your finished goods.

Learning Objectives

- Discuss the stages of new product development.
- Examine how companies have new products manufactured.
- Describe effective marketing techniques.
- Participate in the operation of a manufacturing project.



Final Exam

Learning Objectives

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from lessons five to eight in this course – the last four lessons. (Note: You will be able to open this exam only one time.)