

Course **Syllabus**

What you will learn in this course



Introduction to Manufacturing: Product Design & Innovation

Think about the last time you visited your favorite store. Have you ever wondered how the products you buy make it to the store 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 this course, you'll learn about the types of manufacturing systems and processes used to create the products we buy every day. You'll also be introduced to the various career opportunities in the manufacturing industry including those for engineers, technicians, and supervisors. As a culminating project, you'll plan your own manufacturing process for a new product or invention! If you thought manufacturing was little more than mundane assembly lines, this course will show you just how exciting and fruitful the industry can be.

Unit 1: Introduction to Manufacturing

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 unit, 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.

What will you learn in this unit?

- 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

UNIT 1 Assignments	
Assignment	Type
Unit 1 Critical Thinking Questions	Homework
Unit 1 Lab	Homework
Unit 1 Activity	Homework
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Quiz

Unit 2: Success in Manufacturing Part 1: Soft Skills

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 unit, you'll explore some of the "soft" skills that, when properly developed, can jump-start a career in manufacturing.

What will you learn in this unit?

- 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

UNIT 2 Assignments	
Assignment	Type
Unit 2 Critical Thinking Questions	Homework
Unit 2 Lab	Homework
Unit 2 Activity	Homework
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Quiz

Unit 3: Success in Manufacturing Part 2: Teamwork

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 unit, you'll learn about some of the most important teamwork skills employees need to be successful on the job, particularly in the manufacturing industry.

What will you learn in this unit?

- Describe how teams function together, solve problems, and measure results

- Identify team roles
- Discuss theories of motivation
- Identify the stages of team development

UNIT 3 Assignments	
Assignment	Type
Unit 3 Critical Thinking Questions	Homework
Unit 3 Lab	Homework
Unit 3 Activity	Homework
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Quiz

Unit 4: Success in Manufacturing Part 3: Hard Skills

As you learned in the previous units, “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 unit, you’ll discover some of these “hard” skills that enable employees in the manufacturing industry to do their jobs effectively.

What will you learn in this unit?

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

UNIT 4 Assignments

Assignment	Type
Unit 4 Critical Thinking Questions	Homework
Unit 4 Lab	Homework
Unit 4 Activity	Homework
Unit 4 Discussion 1	Discussion
Unit 4 Discussion 2	Discussion
Unit 4 Quiz	Quiz

Introduction to Manufacturing Midterm Exam

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

MIDTERM Assignments	
Assignment	Type
Midterm Exam	Exam
Midterm Discussion	Discussion

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

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 unit, you'll learn about some of those skills that help engineers do their jobs to the best of their abilities.

What will you learn in this unit?

- Analyze engineering concepts

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

UNIT 5 Assignments	
Assignment	Type
Unit 5 Critical Thinking Questions	Homework
Unit 5 Lab	Homework
Unit 5 Activity	Homework
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Quiz

Unit 6: Safety in Manufacturing

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 unit, you'll examine some of the most important guidelines that employers must follow to protect the men and women who work for them.

What will you learn in this unit?

- 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

UNIT 6 Assignments

Assignment	Type
Unit 6 Critical Thinking Questions	Homework
Unit 6 Lab	Homework
Unit 6 Activity	Homework
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Quiz

Unit 7: Careers in Manufacturing

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 unit, you'll explore some of those career opportunities. You'll also have the chance to develop some personal career goals of your own.

What will you learn in this unit?

- 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

UNIT 7 Assignments	
Assignment	Type
Unit 7 Critical Thinking Questions	Homework
Unit 7 Lab	Homework
Unit 7 Activity	Homework
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion

Unit 7 Quiz	Quiz
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Unit 8: Culminating Manufacturing Project

Over the duration of this course, you've learned quite a bit about the manufacturing industry. In this unit, 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.

What will you learn in this unit?

- 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

UNIT 8 Assignments	
Assignment	Type
Unit 8 Critical Thinking Questions	Homework
Unit 8 Lab	Homework
Unit 8 Activity	Homework
Unit 8 Discussion 1	Discussion
Unit 8 Discussion 2	Discussion
Unit 8 Quiz	Quiz

Introduction to Manufacturing Final Exam

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

FINAL Assignments	
Assignment	Type
Final Exam	Exam
Final Exam Discussion	Discussion

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