



# monarch

Curriculum Catalog

Career and Technical Education Series

Introduction to Careers in Manufacturing

## Table of Contents

<b>INTRODUCTION TO CAREERS IN MANUFACTURING COURSE OVERVIEW .....</b>	<b>1</b>
UNIT 1: SCOPE AND ECONOMIC EFFECT OF MANUFACTURING IN THE USA AND BEYOND.....	2
UNIT 2: PROCESS IMPROVEMENT IN MANUFACTURING .....	2
UNIT 3: CAREERS IN MANUFACTURING .....	2
UNIT 4: ADVANCED MANUFACTURING PROCESSES.....	2
UNIT 5: SAFETY AND REGULATIONS IN MANUFACTURING.....	3
UNIT 6: COURSE PROJECT, REVIEW, AND EXAM.....	3

## Introduction to Careers in Manufacturing Course Overview

The Introduction to Careers in Manufacturing course provides the fundamentals of manufacturing in the United States and explores the jobs and career opportunities that manufacturing offers.

Unit 1 provides an overall view of manufacturing in the United States, including how it evolved, how manufacturers are organized, and the impact of manufacturing on our society and economy.

Unit 2 examines the elements of process design, management, and improvement through quality assurance plans, production and quality control, and performance measurement systems.

Unit 3 focuses on jobs and careers in manufacturing, including the need for skilled workers, the outlook for manufacturing in the U.S., and the competencies that manufacturers value and develop in their workers.

Unit 4 focuses on key elements in manufacturing systems and types of manufacturing processes. It also covers research and development, product design, process design and management, and lean manufacturing.

Unit 5 addresses two areas of concern for manufacturers: compliance and safety. It introduces the regulatory and safety environments in which manufacturers work and the steps they take to comply with regulations, as well as the steps some manufacturers take to go beyond compliance to create a high-performing workplace.

### Objectives

- Evaluate the impact of manufacturing, including the Industrial Revolution and Second Industrial Revolution, on the U.S. society and economy.
- Describe the value of manufacturing to and its impact on American society and economy.
- Analyze possible careers available in manufacturing and its subsectors and in manufacturing operations.
- Interpret the trends in manufacturing technologies and how they will change the industry and our lives.
- List the benefits of standards in manufacturing processes and products.
- Identify the goals of quality assurance, including process redesign, management, and improvement.
- Estimate the diversity of and potential for growth in manufacturing career opportunities, including the need for skilled workers.
- Describe the personal effectiveness, academic, and workplace competencies, and evaluate their value to manufacturers.
- Summarize the manufacturing research and development process and the types of jobs needed to perform it.
- Characterize the role of product design in manufacturing, and list the steps in a typical product design process.
- Describe how manufacturers design, manage, and improve their processes.
- Compare the types of production systems and processes.
- Define manufacturing process, and identify the types of jobs such processes offer.
- Describe the benefits, key principles, and elements of lean manufacturing.
- Examine the purpose of regulations for manufacturers.
- List the main compliance areas for manufacturing.
- Evaluate the impact of regulations on manufacturing, on public health and safety, and on environmental protection.
- Summarize the most common safety hazards in manufacturing.
- Describe the key components of an effective workplace safety program.
- Characterize the attributes of a high-performing workplace.

Unit 1: Scope and Economic Effect of Manufacturing in the USA and Beyond	
Intro. to Careers in Manufacturing	<b>Assignments</b>
	1. Course Overview
	2. The Evolution of Manufacturing
	3. How Manufacturers Are Organized
	4. Project: Learning About Your Interests
	5. The Impact of Manufacturing
	6. Project: Emerging Technologies
	7. Quiz 1: Manufacturing's Impact on the Economy
	8. Manufacturing Industries
	9. Project: Learning More about a Manufacturing Subsection
	10. Manufacturing Technologies
	11. Project: The Impact of a New Technology
	12. Manufacturing Operations
	13. Quiz 2: The Structure of Manufacturing
	14. Special Project*
	15. Test
	16. Course Project Part 1: Exploring a Career in Manufacturing*
17. Glossary and Credits	

Unit 2: Process Improvement in Manufacturing	
Intro. to Careers in Manufacturing	<b>Assignments</b>
	1. Quality Assurance
	2. Manufacturing Process Improvement
	3. Project: Use PDSA to Problem Solve
	4. Manufacturing Process Redesign
	5. Project: Redesign a Process
	6. Quiz 1: Process Management and Improvement
	7. Production Planning and Inventory Control
	8. Production Control and Quality Control
	9. Project: Interpret Variation in a Process
	10. Measuring Performance
	11. Project: Compare Balanced Scorecards
	12. Quiz 2: Production Quality, Planning, and Control
	13. Special Project*
	14. Test
	15. Course Project Part 2: Explore Jobs and Careers*
16. Glossary and Credits	

Unit 3: Careers in Manufacturing	
Intro. to Careers in Manufacturing	<b>Assignments</b>
	1. Careers in Manufacturing
	2. Project: Find Job Openings at a Manufacturer
	3. The Outlook for Manufacturing Jobs
	4. Education for Careers in Manufacturing
	5. Project: Evaluate Your Readiness for Manufacturing Jobs
	6. Quiz 1: Jobs and Careers in Manufacturing
	7. Personal Effectiveness Competencies for Manufacturing
	8. Academic Competencies for Manufacturing
	9. Project: Improve Your Academic Competencies
	10. Workplace Competencies for Manufacturing
	11. Project: Explain a Business Fundamental
	12. Quiz 2: Competencies for Manufacturing
	13. Special Project*
	14. Test
	15. Course Project Part 3: Prepare a Learning Plan*
16. Glossary and Credits	

Unit 4: Advanced Manufacturing Processes	
Intro. to Careers in Manufacturing	<b>Assignments</b>
	1. Manufacturing Research and Development
	2. Project: Research and Development: Is It for You?
	3. Product Design
	4. Process Design and Management
	5. Project: Developing an Understanding of Continuous Improvement
	6. Quiz 1: Product and Process Design
	7. Manufacturing Systems
	8. Project: The Baldrige Award
	9. Manufacturing Processes
	10. Lean Manufacturing
	11. Project: A Case Study: Toyota's Lean Manufacturing Process
	12. Quiz 2: Manufacturing Systems and Processes
	13. Special Project*
	14. Test
	15. Course Project Part 4: Think Process*
16. Glossary and Credits	

Unit 5: Safety and Regulations in Manufacturing	
Intro. to Careers in Manufacturing	<b>Assignments</b>
	1. Manufacturing Regulations and Standards
	2. Compliance for Manufacturers
	3. Project: Research Manufacturing Compliance Jobs
	4. The Impact of Regulations on Manufacturing
	5. Project: Argue a Regulatory Issue
	6. Quiz 1: Manufacturing Regulations and Compliance
	7. Manufacturing Workplace Hazards
	8. Manufacturing Workplace Safety Programs
	9. Project: Study OSHA Violations
	10. Developing a High-Performing Workplace
	11. Project: Evaluate a Best U.S. Company
	12. Quiz 2: Safety in a High-Performing Workplace
	13. Special Project*
	14. Test
	15. Course Project Part 5: Determine Potential Hazards*
16. Glossary and Credits	

Unit 6: Course Project, Review, and Exam	
ICM	<b>Assignments</b>
	1. Course Project Part 6: Look to the Future*
	2. Review
	3. Exam

(\*) Indicates alternative assignment