Odysseyware®

CURRICULUM OVERVIEW

Engineering and Product Development

Career and Technical Education Series

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Engineering and Product Development Course Overview

This course provides an overview of the concepts of product engineering and development. Students will analyze the life cycle of a product to prepare a product for distribution and for target markets. The course begins with building an understanding of the product life cycle, from the initial idea to drafting requirements to using 3-D modeling tools and other design tools. The final unit focuses on assembling the pieces within a project plan to achieve a product and evaluating the plans for a successful product launch. In addition, the course will provide information about the different careers available to students interested in engineering, product development, and project management.

- **Introduction to Engineering and Product Development**: Students learn about engineering and the stages of the product development life cycle.
- **Project Charter and Requirements**: Students learn about phases in the product development life cycle including entrance and exit criteria and deliverables.
- **Design and 3-D Modeling**: Students learn about design, 3-D modeling and engineering design careers.
- **Product Launch**: Students explore product launch, implementation plans and preparations for marketing and distribution of a product.
- **Review Full Product Development Life Cycle**: Students learn about incorporating the engineering deliverables and components to prepare and assemble a project plan that represents a full product life cycle.

Engineering and Product Development

Unit 1: Introduction to Engineering and Product Development

Assignments

1. Course Overview
2. Introduction to Engineering
3. Fundamentals of Product Development
4. Project: Analyze Product Engineering
5. Identifying and Testing Product Concepts
6. Project: Product Development Process
7. Quiz 1: Engineering and Product Concepts
8. Requirements in Engineering, Design and Developing a Prototype
9. Project: Write Engineering Requirements for Your Product
10. Testing the Product
11. Deploying Products to Market
12. Project: Software Deployment Plan
13. Quiz 2: Specifications, Design and Testing Products
14. Special Project*
15. Test
16. Course Project Part 1: Research Smart Grids*
17. Glossary and Credits

Engineering and Product Development

Unit 2: Project Charter and Requirements (PDLC Phases)

Assignments

1. What is a Project Charter?
2. Writing Project Charters and Understanding Requirements
3. Project: Write a Project Charter
4. Analyzing Project Charters
5. Project: Write a Charter for a Recycling Project
6. Quiz 1: The Components of Project Charters
7. What Are Requirements?
8. Defining and Writing Requirements
9. Project: Competing with the Best
10. Writing Product Requirements
11. Project: Reverse Engineering
12. Quiz 2: Establishing Requirements
13. Special Project*
14. Test
15. Course Project Part 2: Summarizing Case Studies of Selected Smart Grid Technology*
16. Glossary and Credits

Engineering and Product Development

Unit 3: Design and 3-D Modeling

Assignments

1. Design Engineering
2. Project: Student Engineer Needed: Houseplant Watering System
3. Analyze Problems and Potential Solutions in Design Engineering
4. Analyze Design Plans
5. Project: Design a Running Shoe
6. Quiz 1: Exploring the Possibilities in Design
7. Engineering Modeling Tools
8. Practice Using Engineering Modeling Tools
9. Project: Design a Part in 3D
10. Evaluate Engineering Tools and Careers
11. Project: Evaluate 3D Modeling Tools
12. Quiz 2: Becoming Familiar with Design Tools
13. Special Project*
14. Test
15. Course Project Part 3: Developing Components for the Final Project Plan*
16. Glossary and Credits

Engineering and Product Development

Unit 4: Product Launch (Implementation)

Assignments

1. The Implementation Stage
2. Analyze an Implementation Plan
3. Project: Write an Implementation Plan
4. PLM, Implementation, and Industry Concepts
5. Project: Prepare a Presentation about Engineering Contests
6. Quiz 1: Putting Implementation into Action
7. Implementation Plan and Product Launch
8. Implementation Plan and Product Life Cycle
9. Project: Timeline, Market, Budget
10. Marketing, Engineering, and Implementation
11. Project: Reverse Engineer a Marketing Plan
12. Quiz 2: Getting the Product Ready for the Market
13. Special Project*
14. Test
15. Course project Part 4: Designing and Modeling the Smart Grid*
16. Glossary and Credits

Engineering and Product Development

Unit 5: Review Full Product Development Life Cycle

Assignments

1. Reviewing the Product Development Life Cycle and Key Strategies
2. Project: Write a Project Plan
3. Assembling a Successful Project Plan
4. Planning, Structure, and Thinking Behind Project Plans
5. Project: Write Part of a Project Plan Chart
6. Quiz 1: Putting Together the Pieces of the Plan
7. Compare and Contrast Project Plans
8. Assembling Project Plans and Engineering for the Twenty-First Century
9. Project: Develop a 3-D Video Game Project Plan and Sample Game
10. How to Evaluate Project Plans
11. Project: Write a Project Brief and Evaluate It
12. Quiz 2: Perfecting Your Project Plan
13. Special Project*
14. Test
15. Course Project Part 5: Implementation Plan*
16. Glossary and Credits

E&PD

Unit 6: Course Project, Review, and Exam

Assignments

1. Course Project Part 6: Finalize Your Proposal*
2. Review
3. Exam

(*) Indicates alternative assignment