

GEAR FUNDAMENTALS

eLearning courses designed to increase productivity and profits



Learning made Simple, Visual, and Interactive

The Gear Fundamentals course is a visual course designed for any learner who must become familiar with the various gear types and how they are utilized to form different gearboxes. In this course, learners engage with animations and visuals that provide basic understanding of what are gears, as well as how gears work with the aid of various engineering concepts and gearing principles. This course includes gear and gearbox terminology and applications, along with important calculations to further express the importance of the topic and its basic principles.

Credit Hours **4**

Learning Objectives

- Recognize what gears are, and why they are important, especially for both power transmission and motion control.
- Describe the different basic gear forms and arrangements and understand the advantages and disadvantages of each.
- Review examples of different types of prime movers.
- Identify alternatives to gears for power transmission and motion control applications.
- Understand the relationship between and calculate for work, power, and torque.
- Recognize the need for smooth (conjugate) motion in gear meshing and be aware of the Law of Gearing.

Table of Contents

I. Gears Basics

- What are Gears?
- Gear Types
 - o Cylindrical Gear Types
 - o Non-Cylindrical Gear Types
- Alternatives to Gears

II. Basic Engineering Concepts

- Speed: Linear and Rotational
 - o Linear Motion
 - o Rotational Motion
 - o Converting Rotational Speed to Linear Speed
 - o Converting RPM to Radians per Second

- Work, Power, and Torque
- Alternate Way to Calculate Power

III. Gearing Principles

- The Law of Gearing
- Cycloid Tooth Form
- Circular Arc Tooth Form
- Involute Tooth Form
 - o Involute Shape and Action

IV. Gearbox Types and Applications

- What are Gearboxes?
- Gearbox Importance
 - o The Ideal Solution
 - o The Primary Challenge
 - o Overcoming Limitations

• Gearbox Concepts

- o Gearbox Ratio
- o Power and Torque Relationship

• Gearbox Types

- o Spur and Helical Gearboxes
- o Epicyclic Gear Arrangements

• Gear and Gearbox Applications

- o Power Transmission and Control
- o Speed Increaser and Reducer

