Topic Areas & Learning Objectives

➢ **Primary Types and Methods** – assess the ability to:
  - Know and understand basic precision sheet metal vocabulary terms
  - Describe precision hand measurement tool care and its use
  - Understand press brake types and forming methods from mechanical to electric press brakes
  - Understand bending methods including air, bottom, and coin bending

➢ **Calculations and Blueprints** – assess the ability to:
  - Understand fundamental mathematic concepts used in a fabrication shop from basic calculator functions through right angle trigonometry
  - Know and understand bend functions, how to develop bend allowance, bend deductions, setbacks, and mold lines
  - Understand blueprint interpretation for sheet metal including Y14.5

➢ **Punches** – assess the ability to
  - Understand press brake punches including the types, styles, uses, and limits of each
  - Know press brake load limits as compared to tooling limits
  - Know the differences and effects of various methods (air, bottom, or coin) on tooling selection

➢ **Dies** – assess the ability to:
  - Understand press brake dies including the types, styles, uses, and limits of each
  - Understand how to make proper die selection to achieve desired results from engineering to the shop floor

➢ **Forming** – assess the ability to:
  - Understand forming types including sharp, radius, and profound radius bends
  - Understand cold forming, warm forming, and hot forming and the effects of heating and cooling materials
  - Understand basic plate forming issues including cracking, bend reliefs, grain direction, and various forming tools
  - Selection and application of effective forming strategies

➢ **Additional Tools and Methods** – assess the ability to:
  - Describe other press brake tools and methods
  - Understand deep box forming using balanced and unbalanced tooling
  - Understand bump radius bending technique
  - Know the basics of urethane forming and understand durometers (how to work with both low and high durometers) and pad volumes
➢ **Bottom Bending** – assess the ability to:
  • Describe bottom bending and how it works
  • Understand the proper use and application of bottom bending, if and where the method is used
  • Know the safety issues of bottom bending and discuss the dangers of the process on the parts and to the machine

➢ **Press Brake Safety** – assess the ability to:
  • Describe basic inspection and quality control functions on the shop floor
  • Understand general sheet metal safety practices and safety issues specifically concerning the press brake
  • Describe OSHA regulations and unacceptable safety practices