

## **PU 106: Introduction to Composites**

### Introduction to Composites

- What is a Composite and Where Do Composites Fit?
- History of Composites
- General Classification of Composites (Continuous vs. Discontinuous Fibers)
- General Composite Applications
- Advantages / Disadvantages of Composites
- Strategy When Using Composites
- Main markets

### Resin Technology

- Introduction to Resins
- Thermoset vs. Thermoplastic
- Overview of Thermoplastics
- Overview of Thermosets
- Detailed Thermosets Information
  - Polyesters
  - Vinyl Esters
  - Epoxies (base + hardener discussion)
  - Polyurethanes
  - Phenolics
  - Others
- Resin Selection Guidance
- Example Formulations

### Filler/Fiber Technology

- Introduction to Fillers/Fibers
- Continuous Fibers vs. Discontinuous Fibers
- Fiber Type Comparison
- Textile Forms and Architecture
- Fiber/Matrix Interface
- Fiber Sizing

### Manufacturing Processes

- Cycle Times
- Impregnate and Form (PU/resins)
- Place and Form – Thermoset Compression Molding

### Manufacturing Equipment

- Dosing Units
- Mixing Heads
- Presses, Performers, and Molds

### Recycling and Circular Economy

- EU Regulation
- Recycling Carbon Fiber