DARKAERO

DarkAero Aerospace Composites Course
Curriculum and Schedule

DAY 1 - 8AM-5PM

8AM - Morning Session - Classroom Theory - What are Aerospace Composites?

Personal Introductions / Orientation

Introduction to Aerospace Composites
- What are aerospace composites?
- Why use composite materials?
- Requirements for designing aerospace composite structures.

What are Fiber Reinforcements (Fiber)?
- Fiber Types
- Weave Types
- Sizing Agents

What are Polymer Matrix Types (Resin)?
- Thermosets
- Thermoplastics
- Key mechanical properties and selecting the right resin.

Core Materials
- Foam Cores
- Honeycomb Cores
- Infusable Cores

Manufacturing Processes - Methods of Combining Fiber and Resin
- Wet Layup
- Wet Layup + Vacuum Bag
- Filament Winding
- Infusion / VARTM
- Out of Autoclave Prepreg
- Autoclave Prepreg

Post Curing - The Most Important Step
- Cure Reaction Mechanics
- Cure Schedules

12PM Lunch (Provided)

1PM Afternoon Session - Infusion Demonstration - Carbon Fiber Wing Section

Briefing
- Personal Protective Equipment and Safety
- Process Equipment and Tools

Process Setup
- Mold Preparation
- Cloth Cutting and Placement
- Vacuum Bagging
- Infusion
- Troubleshooting Methods
- Tips and Tricks

Quality Control Discussion
- Key Process Variables
- Achieving Aerospace Quality

5PM - Adjourn

DAY 2 - 8AM-4:30PM

8AM - Morning Session - Infusion Demonstration - Post Processing

Part Demolding
- Safety Procedures
- Tips and Tricks to Avoid Part Damage

Part Trimming
- Recommended Tools
- Strategies and Techniques for Trimming
- Hands-On Practice

Quality
- Non-Destructive Inspection
- Measures of Quality

Full Infusion Process Review

12PM Lunch (Provided)

1PM Afternoon Session - Classroom Theory - Designing Composite Parts

Post Curing

- In Depth Discussion from Dr. Alec Redmann - PhD

Composite Assemblies

- Bonding
- Fastening
- Hardpoints

Designing Composite Structures

- Establishing Requirements
- Composites vs Metals vs Plastics
- Selection of Fiber, Matrix, Core, & Process
- Fiber Orientation & Layup Schedules

Part Testing

- Non-destructive Test Methods
- Destructive Testing
- Using Test Results to Drive the Design

4:30PM Adjourn