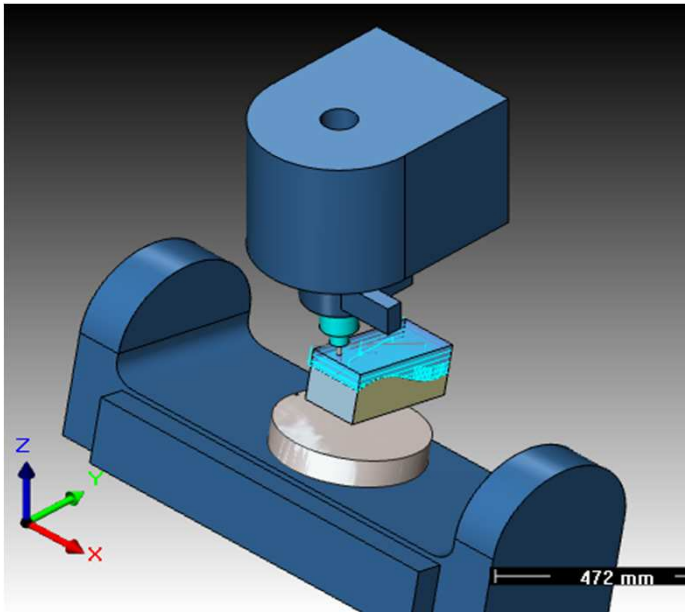
CNC Machining Simulation

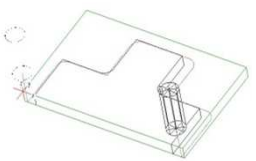
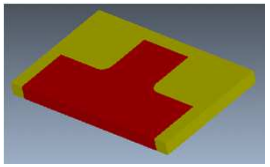
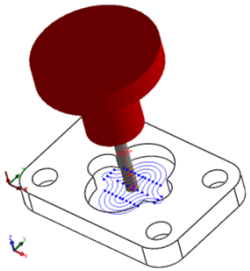
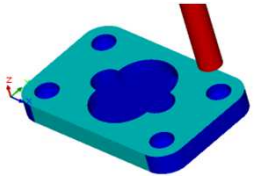
(using CAMWorks or Pro/MFG)



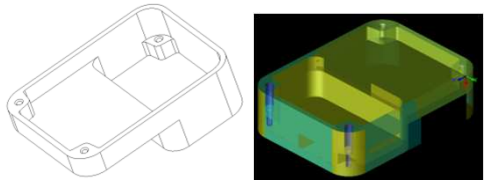
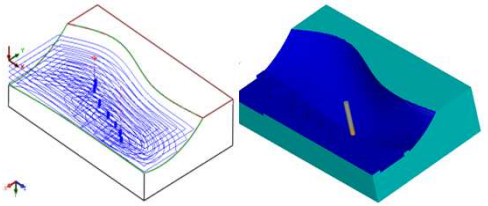
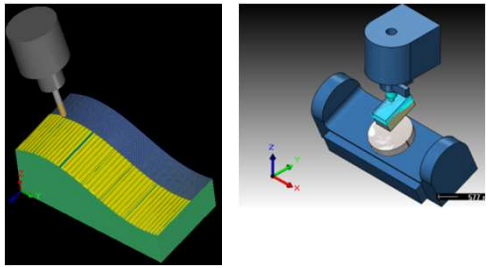
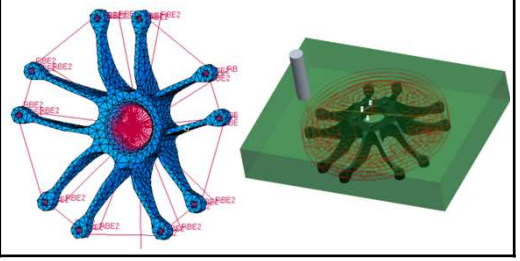
Course Outline

CAD Answers

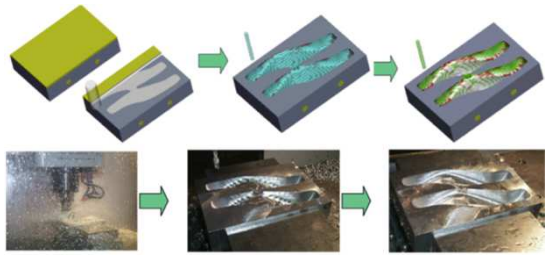
Course Plan—Day 1

Day 1	Lesson	Contents	Examples
Morning	1. Introduction and Overview of *SolidWorks*	• Course introduction • *CAMWorks* overview • User interface • Tutorial example: profile milling • *CAMWorks Help* and tutorial models	 
	2. Fundamentals of NC Programming	• Fundamental of numerical control (NC) machines • Overview of NC part programming • Machine control data (MCD) or NC codes • Tool radius compensations • Canned cycles • Practical aspects	 HAAS VF-Series 3-Axis Mill  HAAS VF-Series 3-Axis Mini-Mill
Afternoon	3. A Quick Run Through—Machining a Simple Plate	• A quick run through using 2½-axis mill • Review the knowledge-based capabilities • Create contour, pocket, and hole drilling NC sequences • Display toolpath and machining simulation	 
	4. Machining a Name Plate	• The name plate example • Sketch text • Text engraving sequence • Using *CAMWorks* • Modifying toolpath by adjusting scan type, step over, and using different cutters	

Course Plan—Day 2

Day 2	Lesson	Contents	Examples
Morning	5. Machining a Block	• The block example • Set machine zeros to cut both sides • Hole drillign and countersinking • Modifying toolpath by adjusting scan type, step over, and using different cutters	
	6. Machining a Freeform Surface	• Import *Pro/ENGINEER* model with fully parametric features • Set machine zero for imported part • Insert multi surface feature • Create *Area Clearance* (volume milling) and *Pattern Project* (finish cut) sequences • Adjust machining parameters to regenerate toolpath	
Afternoon	7. Multiaxis Surface Milling	• The Bezier surface example • Create multiaxis mill • Adjust machining parameters to regenerate toolpath 4-axis mill • Use *Machine Simulation* to simulate 4-axis toolpath in a setup of tilting rotary table	
	8. Sample Project I — Machining a Racecar Wheel Center	• Wheel center, machining features • NC sequences, cutters, machining parameters • Fixtures • Using *CAMWorks* (or *Pro/MFG*) • Lessons learned	

Course Plan—Day 3

Day 3	Lesson	Contents	Examples
Morning	9. Sample Project II—Die Design and Machining	• Die design, spruce, runners, and waterlines • NC sequences, cutters, machining parameters • Fixtures • Using *CAMWorks* (or *Pro/MFG*) • Lessons learned	
	10. Sample Project III—Aircraft Torque Tube	• Machining features: fins, bracket, holes • NC sequences, cutters, machining parameters • Fixtures • Using *CAMWorks* (or *Pro/MFG*)