



Wohlers Associates, Inc.
Three-Day DfAM Course Outline

Date	Topic	Details
Day 1		
8:30-9:00	Introduction	Introduction to the course and attendees.
9:00-10:15	Intro to AM And the state of the AM industry	Recent AM growth trends and developments around the world. Benefits of AM in the context of DfAM, how AM is being applied, and how certain parts can be designed for AM.
10:15-10:30	Break	
10:30-12:00	AM process: from CAD to part	Examining the complete AM process chain, from CAD part creation, to part production. Attendees will gain an understanding of the entire process chain and how it helps them to design better AM parts, file formats, and working with STL manipulation software. Opinions and commentary on the major AM processes, materials, companies, and products.
12:00-13:15	Lunch	
13:15-14:45	AM design optimisation exercise	Thought processes behind DfAM. In this exercise, we will design a hydraulic manifold while considering print orientation and support material.
14:45-15:00	Break	
15:00-15:45	Part consolidation exercise	Implications of part consolidation for AM. Hands-on exercises in part consolidation.
15:45-17:00	Design for mass-customization exercise	Hands-on exercise to design a custom product using a combination of CAD, 3D scanning, and STL editing software. This exercise introduces attendees to the idea of working with multiple software tools and technologies to produce parts that are optimized for AM.
Day 2		
8:30-10:00	AM process: from CAD to part	Opinions and commentary on other popular AM processes, materials, companies, and products.
10:00-10:15	Break	
10:15-11:15	Designing for metal AM	Specific issues and guidelines around designing for metal AM, including anisotropy, process constraints, general guidelines related to wall thicknesses, hole sizes, tolerances, angles, etc. Close look at metal AM post-processing and material properties.

11:15-12:00	Lattice structure exercise	An exercise in which a solid part is transformed into a shell filled with a lattice structure.
12:00-13:15	Lunch	
13:15-14:45	Panel Session	AM experts offering opinions and answering questions from attendees.
14:45-15:00	Break	
15:00-17:00	Topology optimization	Session on designing topology-optimized parts for AM, and creating light-weight parts using software such as Inspire from solidThinking. The general workflow of topology optimization, setting up multiple load-cases, and then using the generated ideas to produce a final design.
Day 3		
8:30-10:00	Designing for polymer AM processes	Specific issues and design guidelines surrounding polymer AM (material extrusion, LS, SL, etc.), including post-processing.
10:00-11:00 (including break)	Tooling applications of AM	AM beyond direct part production: Tools for injection-molding, sheet-metal forming, cutting and drilling, extrusion, jigs and fixtures, etc. Adding fixtures to parts to ease mounting on CNC machines for more efficient post-processing.
10:15-10:30	Break	
11:00-12:00	Economics of AM	When does it make sense, or not make sense, to use AM for production quantities?
12:00-13:15	Lunch	
13:00-14:45	Design guidelines and documentation	Examination of the design guidelines document and how to apply and expand them in the best ways possible
14:45-15:00	Break	
15:00-16:00	AM in the near future	Looking at where AM and design software tools are headed in the near future and the implications they will have on DfAM.
16:00	Conclusion	



Design for Additive Manufacturing