

Autodesk Fusion 360: Beyond the Basics

Target Audience

This course is designed for product designers, mechanical engineers, industrial designers, manufacturing professionals, CAD specialists, and technical professionals who already possess a foundational understanding of Autodesk Fusion 360 and wish to enhance their expertise with advanced modeling, assemblies, AI-assisted design workflows, and professional documentation. It is also suitable for professionals transitioning to cloud-based collaborative product development environments and engineers looking to leverage Autodesk Fusion 360's latest AI-powered capabilities to improve design efficiency, productivity, and innovation.

Course Objectives

Upon completion of this course, participants will be able to:

- Develop advanced parametric models using professional design methodologies.
 - Apply advanced sketching and feature creation techniques to complex engineering designs.
 - Create and manage sophisticated assemblies using industry-standard workflows.
 - Optimize product designs using advanced modeling tools and feature editing techniques.
 - Generate professional engineering documentation and manufacturing drawings.
 - Utilize Autodesk Fusion Assistant to streamline modeling workflows through AI-powered guidance.
 - Understand AI-assisted design recommendations and their practical applications.
 - Improve collaboration using Fusion 360 cloud data management capabilities.
 - Apply best practices for design validation and manufacturing readiness.
 - Build confidence in handling real-world product development projects.
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Course Outcomes

After completing this course, participants will be able to:

- Understand advanced Fusion 360 design workflows.
- Apply advanced parametric modeling techniques.
- Create complex engineering components efficiently.



- Optimize models using professional editing tools.
- Design and manage multi-component assemblies.
- Analyze component relationships and motion.
- Utilize Autodesk Fusion Assistant for AI-powered productivity.
- Implement AI-assisted engineering workflows.
- Produce manufacturing-ready engineering documentation.
- Prepare production-ready CAD models following industry standards.

Course Outline

The course comprises **32 hours** of theory and labs and is divided into **15 different chapters**. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Chapter 1. Advanced Fusion 360 Environment & Workflow Management

- Installing Autodesk Fusion 360
- Understanding Cloud Licensing
- Navigating the Updated User Interface
- Managing Workspaces Efficiently
- Creating New Design Files
- Managing Cloud Projects
- Data Panel Best Practices
- Version Control
- Design File Management
- Exporting Designs
- Importing Existing CAD Files
- Working in Offline Mode
- Recovering Unsaved Designs
- Sharing Designs Securely
- Marking Menus and Productivity Tips
- Introduction to 3D Printing Workflow

Chapter 2. Precision Sketching Techniques for Parametric Design

- Advanced Sketch Environment
- Plane Selection Strategies
- Units and Grid Configuration
- Creating Precision Lines
- Tangent Arc Techniques
- Advanced Rectangle Tools
- Circle Creation Methods
- Arc Construction
- Polygon Creation
- Ellipse Design
- Slot Profiles
- Conic Curves
- Advanced Splines
- Editing Splines
- Fit Points vs Control Points
- Curvature Analysis
- Sketch Points
- Sketch Text

Chapter 3. Advanced Sketch Editing & Geometry Optimization

- Trim and Extend Operations
- Offset Geometry
- Construction Geometry
- Mirror Sketch Geometry
- Rectangular Patterns
- Circular Patterns
- Sketch Fillets

- Sketch Chamfers
 - Sketch Scaling
 - Breaking Sketch Entities
 - Sketch Cleanup Techniques
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Chapter 4. Parametric Constraints & Design Intent Management

- Geometric Constraints
 - Applying Constraints Efficiently
 - Constraint Visibility
 - Smart Dimensioning
 - Editing Dimensions
 - Fully Defined Sketches
 - Sketch Status Analysis
 - Working with Sketch Palette
 - Best Practices for Parametric Design
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Chapter 5. Building Robust Parametric Solid Features

- Advanced Extrude Techniques
 - Revolve Features
 - Thin Features
 - Symmetric Extrusions
 - Multi-body Creation
 - Feature Editing
 - Navigating Complex Models
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Chapter 6. Reference Geometry for Complex Design

- Construction Planes
- Offset Planes
- Mid Planes

- Tangent Planes
 - Construction Axes
 - Reference Axes
 - Construction Points
 - Reference Geometry Best Practices
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Chapter 7. Advanced Parametric Modeling Techniques – I

- Advanced Extrude Options
 - Advanced Revolve Options
 - Multi-profile Sketches
 - Project Geometry
 - 3D Curves
 - Editing Existing Features
 - Editing Sketch Planes
 - Physical Material Assignment
 - Custom Material Libraries
 - Mass Properties
 - Measurement Tools
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Chapter 8. Advanced Parametric Modeling Techniques – II

- Sweep Features
- Loft Features
- Rib Features
- Web Features
- Emboss Features
- Hole Features
- Thread Creation
- Primitive Bodies
- Box Creation

- Cylinders
 - Spheres
 - Torus Features
 - Coil Features
 - Pipes
 - Advanced 3D Sketching
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Chapter 9. Feature Replication & Symmetry Strategies

- Rectangular Pattern
 - Circular Pattern
 - Pattern Along Path
 - Mirror Features
 - Mirror Faces
 - Mirror Bodies
 - Mirror Components
 - Pattern Optimization Techniques
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Chapter 10. Professional Solid Model Refinement Techniques

- Press Pull Operations
- Advanced Fillets
- Chamfers
- Shell Features
- Draft Features
- Scaling Models
- Combine Bodies
- Offset Faces
- Split Faces
- Split Bodies
- Model Cleanup Techniques

Chapter 11. Advanced Assembly Design & Motion Control – I

- Bottom-up Assembly Workflow
 - Top-down vs Bottom-up
 - Creating Assemblies
 - Component Management
 - Grounding Components
 - Degrees of Freedom
 - Advanced Joint Creation
 - Joint Editing
 - Joint Limits
 - Joint Animation
 - Motion Studies
 - Drive Joint
 - Relative Motion
 - Contact Sets
 - Group Components
 - Capture Position
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Chapter 12. Advanced Assembly Design & Component Management – II

- Top-down Assembly Design
- Creating Components
- Empty Component Modeling
- Assembly Structure
- As-Built Joints
- Joint Origins
- Editing Components
- Managing References
- Assembly Best Practices

Chapter 13. Autodesk Fusion Assistant & AI-Powered Design Workflows

- Introduction to Autodesk Fusion Assistant
- Understanding AI in Autodesk Fusion 360
- AI-Powered User Assistance
- Natural Language Interaction
- AI Feature Discovery
- AI-Based Design Recommendations
- AI-Assisted Modeling Workflows
- Generative Design Fundamentals
- AI for Design Optimization
- AI-Assisted Manufacturing Preparation
- AI in Documentation
- AI Productivity Tips
- Responsible AI Usage
- Limitations of AI-Assisted Design
- Future of AI in Product Development

Chapter 14. Product Motion Visualization & Animation

- Animation Workspace
- Timeline Management
- Capturing Views
- Capturing Actions
- Editing Storyboards
- Creating Storyboards
- Camera Animation
- Motion Playback
- Publishing Animations
- Presentation Techniques

Chapter 15. Advanced Documentation & Manufacturing Drawings

- Drawing Workspace
- Base Views
- Projected Views
- Auxiliary Views
- Section Views
- Detail Views
- Break Views
- Exploded Views
- Drawing from Animation
- View Editing
- Hatch Editing
- Drawing Sketches
- Moving Views
- Rotating Views
- Dimensions
- Dimension Editing
- Dimension Arrangement
- Breaking Dimensions
- Notes and Leaders
- Surface Texture Symbols
- Bill of Materials (BOM)
- Balloons
- Renumbering Balloons
- Drawing Sheets
- Drawing Templates
- Exporting Drawings