

Autodesk Fusion 360 with Claude MCP

Target Audience

This course is designed for CAD professionals, mechanical engineers, product designers, manufacturing engineers, engineering students, AI enthusiasts, and technical professionals who want to integrate Artificial Intelligence (AI) into their product design workflows using Autodesk Fusion 360 and Claude through the Model Context Protocol (MCP). It is ideal for beginners as well as professionals seeking to leverage AI-assisted CAD design, automate repetitive modeling tasks, accelerate product development, and improve engineering productivity. No prior programming experience is required.

Course Outcomes

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

- Understand the fundamentals of Artificial Intelligence and its applications in engineering design.
 - Navigate and utilize the Autodesk Fusion 360 interface efficiently.
 - Apply Autodesk Fusion Assistant to enhance design productivity.
 - Create, edit, and manage parametric CAD models in Fusion 360.
 - Configure and integrate Claude Desktop with Autodesk Fusion 360 using MCP.
 - Generate and modify CAD geometry using natural language prompts.
 - Apply AI-assisted workflows to accelerate product design and engineering processes.
 - Combine Autodesk Fusion Assistant and Claude AI for intelligent design automation.
 - Validate, optimize, and export engineering models using industry best practices.
 - Complete an end-to-end AI-assisted mechanical design project.
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Course Objectives

After completing this course, participants will be able to:

- Develop a solid understanding of AI concepts and their role in modern CAD workflows.
- Build foundational skills in Autodesk Fusion 360 for mechanical design.
- Gain hands-on experience with Autodesk Fusion Assistant and AI-powered design capabilities.
- Learn the architecture, workflow, and implementation of the Model Context Protocol (MCP).
- Configure Claude Desktop and establish communication with Autodesk Fusion 360 through MCP.

- Create and refine CAD models using AI-driven natural language interactions.
 - Apply prompt engineering techniques for AI-assisted product development.
 - Optimize engineering workflows using AI-powered design automation.
 - Reinforce concepts through practical laboratory exercises and a comprehensive capstone project.
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Course Outline

The course comprises **8 hours** of theory and labs and is divided into **8 different chapters**. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Table of Contents

Chapter 1: Introduction to Artificial Intelligence and AI in Engineering

- Introduction to Artificial Intelligence
- Evolution of AI in Product Design
- AI in CAD, CAM, and CAE
- Generative AI versus Generative Design
- Large Language Models (LLMs)
- Introduction to Claude AI
- AI-assisted Engineering Workflows
- Overview of Model Context Protocol (MCP)
- Benefits and Limitations of AI
- Course Overview

Lab Exercise

- Understanding AI-assisted engineering workflows
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Chapter 2: Autodesk Fusion 360 Environment

- Introduction to Autodesk Fusion 360
- User Interface Overview
- Navigation Controls
- Data Panel
- Browser

- Timeline
- Workspaces
- Projects and File Management
- Cloud Collaboration
- Design Workflow

Lab Exercise

- Exploring the Autodesk Fusion 360 environment
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Chapter 3: AI Features in Autodesk Fusion 360

- Introduction to Autodesk AI
- Autodesk Fusion Assistant
- AI-powered Help and Guidance
- AI-assisted Command Discovery
- AI-powered Design Suggestions
- AI-assisted Documentation
- Introduction to Generative Design
- Fusion AI Best Practices
- Current AI Capabilities
- AI Limitations

Lab Exercise

- Using Autodesk Fusion Assistant for design assistance
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Chapter 4: Basic CAD Modeling in Fusion 360

- Creating Sketches
- Sketch Constraints
- Dimensions
- Extrude
- Revolve
- Hole Feature
- Fillet
- Chamfer

- Patterns
- Editing Features
- Parameters
- Components and Bodies

Lab Exercise

- Create a basic parametric mechanical component
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Chapter 5: Claude MCP Integration with Autodesk Fusion 360

- Introduction to Model Context Protocol (MCP)
- MCP Architecture
- Fusion MCP Server
- Claude Desktop Overview
- Installing Claude Desktop
- Configuring Fusion MCP
- Connecting Claude with Autodesk Fusion 360
- Authentication
- Testing the Connection
- Troubleshooting Integration Issues

Lab Exercise

- Configure and connect Claude Desktop with Autodesk Fusion 360 using MCP
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Chapter 6: Designing with Claude AI

- Prompt Engineering Fundamentals
- Creating Effective CAD Prompts
- AI-assisted Sketch Creation
- AI-driven Feature Generation
- Editing Models with Claude
- Parametric Modifications
- Iterative Design Workflows
- Design Refinement Techniques
- Productivity Enhancement Techniques

- AI Design Best Practices

Lab Exercise

- Build a CAD model using Claude prompts
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Chapter 7: AI-powered Design Workflow

- Working with Autodesk Fusion Assistant
- Working with Claude MCP
- Combining Native Fusion AI and Claude
- AI-assisted Design Validation
- Reviewing AI-generated Results
- Engineering Best Practices
- Design Documentation
- Exporting CAD Models
- Collaboration Workflow
- Common Challenges and Solutions

Lab Exercise

- Refine an existing model using Autodesk Fusion Assistant and Claude AI
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Chapter 8: Capstone Project

- Planning the Mechanical Design
- Creating the Base Parametric Model
- Using Autodesk Fusion Assistant
- Connecting Claude through MCP
- AI-assisted Feature Creation
- Design Optimization
- Model Validation
- Exporting the Final Design
- Future of AI in Autodesk Fusion
- Course Summary