# Autodesk Revit MEP Essentials

## Target Audience

This course is designed for mechanical, electrical, and plumbing (MEP) professionals, BIM modelers, engineers, and drafters who want to learn the fundamentals of Autodesk Revit MEP. It is ideal for beginners and intermediate users looking to enhance their skills in designing, documenting, and analyzing MEP systems within a BIM environment.

## Course Objective

The Autodesk Revit MEP Essentials course aims to provide a strong foundation in modeling MEP systems, enabling participants to create intelligent HVAC, electrical, and plumbing designs. The course focuses on industry-standard workflows, coordination between disciplines, and best practices for developing accurate, parametric MEP models in Revit.

## Course Outcome

- **Fundamental MEP Modeling:** Learn to create and modify MEP components, including HVAC, electrical, and plumbing systems, using Revit's parametric tools.
- **BIM Coordination and Collaboration:** Understand how to work within a shared model environment, integrating MEP designs with architectural and structural elements.
- **System Analysis and Documentation:** Gain expertise in performing system analysis, generating schedules, and producing construction documentation for MEP projects.
- **Project Efficiency and Workflows:** Develop best practices for managing views, templates, and workflows to improve efficiency in MEP modeling and project delivery.

**Course Outline:** The course comprises **40-hours** of theory and labs and is divided into **10** different chapters. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

## Chapter 1. Introduction to Autodesk Revit for MEP

Introduction to Autodesk Revit for MEP
- Mechanical Discipline
- Electrical Discipline
- Plumbing Discipline

Autodesk Revit as a Building Information Modeler (BIM)

Basic Concepts and Principles
- Understanding the Parametric Building Modeling Technology
- Terms Used in Autodesk Revit for MEP
- Creating an MEP Model Using Parametric Elements
- Visibility/Graphics Overrides, Scale, and Detail Level
- Extracting Project Information
- Creating an MEP Drawing Set
- Creating an Unusual Building Geometry
- Flexibility of Creating Special Elements
- Creating Services Layouts
- Working on Large Projects
- Working in Large Teams and Coordinating with Consultants

Starting Autodesk Revit

User Interface
- Title Bar
- Ribbon
- Application Frame
- Status Bar
- View Control Bar
- Options Bar
- Type Selector
- Drawing Area

Project Browser
- Keyboard Accelerators
- Properties Palette

Dialog Boxes

Multiple Document Environment

Interoperability of Autodesk Revit

Building Information Modeling and Autodesk Revit

Autodesk Construction Cloud
Autodesk Revit Help
Export IFC Element Mapping

# Chapter 2. Getting Started with an MEP Project

Overview of an BIM-MEP Project
Essentials for an MEP Project
Starting a New MEP Project
Project Units
- Common Unit Type
- HVAC Unit Type
- Electrical Unit Type
- Piping Unit Type

Project Templates
- Creating a Custom Project Template
- Settings for the Project Template

Linking Revit Models and Sharing Coordinates
- Managing the Linked Revit Models in the Project Browser
- Converting Linked Models to Groups - Binding Links
- Controlling the Visibility of Linked Models
- Managing Links
- Including Elements of Linked Models in Schedules
- Copying Linked Model Elements
- Copying and Monitoring Linked Model Elements

Snaps Tool
- Dimension Snaps Area
- Object Snaps Area
- Temporary Overrides Area

Saving an MEP Project
- Using the Save As Tool
- Using the Save Tool

The Options Dialog Box 2-29 General Tab
- Graphics Tab
- Colors Tab
- Hardware Tab
- File Locations Tab
- Rendering Tab
- Check Spelling Tab

- SteeringWheels Tab
- ViewCube Tab
- User Interface Tab
- Cloud Model Tab

Closing an MEP Project
Exiting an MEP Project
Opening an Existing MEP Project
- Opening an Existing Project Using the Open Tool
- Using the Windows Explorer to Open an Existing Project

# Chapter 3. Creating Building Envelopes

Introduction
Levels
- Understanding Level Properties
- Adding Levels
- Modifying Level Parameters
- Controlling the Visibility of Levels
Working with Grids
- Creating Grids
- Modifying Grids
- Grid Properties
Reference Planes
Work Planes
- Setting a Work Plane
- Controlling the Visibility of Work Planes
Working with Project Views
- Viewing a Building Envelope
- Overriding the Visibility/Graphic of an Element
- Overriding the Visibility/Graphic of Element Category
- Making Elements Transparent
- Using the Temporary Hide/Isolate Tool
- Plan Views
- Elevation Views
- Section Views
- Using the Scope Box Tool
Understanding Wall Types
- Exterior Wall Type

# Chapter 4. Creating Spaces and Zones and Performing System Analysis

Color Schemes
- Creating and Editing Color Schemes
- Applying a Color Scheme to the Spaces
- Adding Color Scheme Legends
- Modifying a Color Scheme
- Modifying a Color Scheme Legend

Creating Zones from Spaces
- Adding and Modifying HVAC Zones

Preforming System Analysis
- Setting the Model
- Adding the Analytical System and Defining the System Zone
- Creating the Analytical Model
- Running the System Analysis

## Chapter 5. Creating an HVAC System

Introduction
Creating an HVAC System
- Understanding Air Terminals
- Adding Air Terminals
- Adding Air Equipments
- Adding Mechanical Control Devices
- Creating Air Supply System
- Creating Return Air Terminals, Air System, and Air Ductwork
- Inspecting the Duct System
- Checking the Duct System
- Creating Duct Legend
- Different Components of an HVAC System
- Recommended Practices for Creating HVAC Systems

Generating HVAC System Layouts
Creating Ducts and Duct Fittings
- Creating Ducts

Fabrication Details in Revit
- Configuring the Fabrication and Loading Services
- Placing the Fabrication Parts

## Chapter 6. Creating an Electrical System

Introduction
Adding Electrical Equipment
- Adding Transformers
- Placing Switchboard Components
- Placing the Panel Board or Distribution Board

Adding Power and System Devices
- Adding Electrical Fixtures
- Adding Lighting Devices
- Adding Communication Devices

Adding Lighting Fixtures
- Type Properties of a Lighting Fixture

Specifying the Electrical Settings
- Setting the Wires
- Setting the Voltage Definition
- Setting the Distribution System
- Setting the Load Calculations
- Setting the Panel Schedules

Creating Power Distribution System
- Electrical Analysis

Performing Lighting Analysis
Creating Circuits
Adding Wires to the Circuit


## Chapter 7. Creating Plumbing Systems

Introduction
Creating a Plumbing System
- Adding Plumbing Fixtures
- Specifying the Pipe Settings
- Routing Pipes in the Pipe System
- Modifying a Pipe Segment
- Placing Fittings
- Placing Pipe Accessories
- Adding Plumbing Equipments


## Chapter 8. Creating Fire Protection System

Introduction
Fire Protection Systems

- Sprinkler Libraries
- Piping Tools
- Wet and Dry Fire Protection Systems

Designing the Fire Protection System
- Setting Up a Fire Protection System Project
- Creating the Space Schedule
- Placing Sprinkler Heads
- Connecting the Sprinklers

# Chapter 9. Creating Fire Protection System

Introduction
Dimensioning
- Types of Dimensions
- Using Temporary Dimensions
- Entities in a Dimension
- Adding Permanent Dimensions
- Modifying Dimension Parameters
- Locking Permanent Dimensions
- Converting Temporary Dimensions into Permanent Dimensions

Text Notes
- Adding Text Notes
- Editing Text Notes

Adding Tags
- Tagging Elements by Category
- Tagging All Elements in a View

Callout Views
- Creating a Callout Using the Rectangle Tool
- Creating a Callout Using the Sketch Tool
- Displaying Callout View
- Modifying the Properties of a Callout View
- Creating Details in a Callout View

Drafting Details
- Creating a Drafting View
- Drafting a Detail

Duplicating Views
- Creating Duplicate View as Dependent View

Sheets
- Adding a Drawing Sheet to a Project

- Adding Views to a Drawing Sheet
- Modifying a Building Model in Sheets
- Adding Schedules to a Drawing Sheet
- Adding Guide Grids to a Sheet

## Chapter 10. Creating Families and Worksharing

Introduction to Massing
Understanding Massing Concepts
Creating the Massing Geometry
- Creating a Massing Geometry in the Family Editor
- Editing a Massing Geometry in the Family Editor
- Creating Cuts in a Massing Geometry Using the Family Editor
- Loading Massing Geometry into a Project
- Placing the Massing Geometry in a Project
- Creating the In-Place Mass in a Project

Massing in Conceptual Design Environment
- Interface of the Conceptual Design Environment
- Creating Masses in the Conceptual Design Environment

Worksharing Concepts
- Worksharing Using Workset Tools
- Process of Worksharing
- Saving Methodology in Worksharing
- Element Ownership Concepts
- Monitoring the Worksharing Process