

# **CAD using SolidWorks - One Month Course Syllabus**

## **Course Overview**

Duration: 1 Month (4 Weeks)

Total Sessions: 16 (4 sessions/week, 1.5-2 hours each)

Level: Beginner to Intermediate

Course Objectives:

- Understand the SolidWorks interface and tools.
- Create 2D sketches and 3D models.
- Apply material properties, constraints, and dimensions.
- Perform assembly and motion analysis.
- Create technical drawings and sheet metal designs.

## **Week 1: Introduction & Sketching**

### **Session 1:**

- **Introduction to CAD and SolidWorks**
- **Understanding the SolidWorks interface**
- **Basic navigation and shortcuts**

### **Session 2:**

- **Creating and modifying 2D sketches**
- **Sketch tools: Line, Circle, Arc, Rectangle**
- **Adding dimensions and constraints**

### **Session 3:**

- **Advanced sketching techniques**

- Trim, Extend, Mirror, and Offset
- Sketch relations and defining fully constrained sketches

#### **Session 4:**

- Practical Exercise: Create a basic mechanical part (e.g., Bracket)

#### **Week 2: Part Modeling**

#### **Session 5:**

- Introduction to 3D modeling
- Extrude, Revolve, Sweep, and Loft features

#### **Session 6:**

- Editing and modifying features
- Fillet, Chamfer, Shell, and Draft

#### **Session 7:**

- Creating patterns (Linear, Circular, Mirror)
- Combining parts using Boolean operations

#### **Session 8:**

- Practical Exercise: Design a mechanical component (e.g., Gear)

#### **Week 3: Assemblies and Motion Analysis**

#### **Session 9:**

- Introduction to Assemblies
- Inserting and aligning components

### **Session 10:**

- Mates and constraints
- Motion analysis basics

### **Session 11:**

- Exploded views and animation
- Detecting interferences

### **Session 12:**

- Practical Exercise: Create and analyze an assembly (e.g., Piston & Cylinder)

### **Week 4: Technical Drawings, Sheet Metal & Final Project**

### **Session 13:**

- Creating 2D technical drawings
- Adding annotations, dimensions, and BOM

### **Session 14:**

- Introduction to sheet metal design
- Bends, flanges, and flat patterns

### **Session 15:**

- Final Project Planning
- Students begin working on a mini-project

### **Session 16:**

- Final Project Presentation
- Feedback and Course Wrap-up

## **Final Project**

- **Design a small mechanical assembly (e.g., gear system, bracket with fasteners)**
- **Submit 3D model, assembly, and technical drawing**

### **Deliverables**

- **3D Models**
- **Assembly files**
- **Technical drawings**
- **Exploded views and animations**