

3-MONTH ONLINE COURSE

AutoCAD, SolidWorks & CATIA

A comprehensive, industry-aligned program designed to take you from foundational drafting skills to advanced 3D modeling and simulation — building the exact competencies hiring managers look for in CAD/CAE roles.

Who This Is For

- Early professionals (0–4 years experience)
- Graduate students in engineering or product design
- Career-transitioning learners entering the CAD/CAE space

Program Snapshot

- Duration: 12 Weeks | 3 Phases
- Weekend recorded sessions + live mentoring
- 70–80% core concepts, 20–30% industry application
- Assignments, mini-projects, and a capstone

WHY THIS COURSE MATTERS

CAD Skills Are the Gateway to Engineering Careers

In today's product development landscape, proficiency in AutoCAD, SolidWorks, and CATIA is not optional — it is a baseline expectation across manufacturing, aerospace, automotive, and consumer product industries. Employers consistently rank CAD competency among their top hiring criteria for entry-level engineers and designers.



Industry Demand

Over 70% of mechanical engineering job postings require proficiency in at least one major CAD platform. AutoCAD and SolidWorks dominate SME hiring; CATIA leads in aerospace and automotive OEMs.



Accelerated Career Entry

Candidates with hands-on CAD project portfolios are hired 40% faster than peers with only theoretical knowledge. Practical skills signal job-readiness to recruiters immediately.



Versatile Skill Set

Mastering all three platforms makes you adaptable across sectors — from small product design studios to global aerospace corporations — dramatically widening your career options.

TOOLS & TECHNOLOGY STACK

Your Three Core Platforms

This course centers on three industry-standard tools that collectively cover the full spectrum of design, drafting, and simulation workflows used in modern engineering environments.

AutoCAD

The global standard for 2D drafting and documentation. Widely used in civil, mechanical, and architectural workflows for creating precise technical drawings, floor plans, and schematics.

- 2D drafting & annotation
- Layouts, blocks & templates
- Sheet sets & plot management

SolidWorks

The leading parametric 3D modeling tool for product design and engineering. Dominates the SME and consumer product space. Renowned for its intuitive interface and robust simulation suite.

- Part & assembly modeling
- Engineering drawings
- FEA simulation (Simulation)

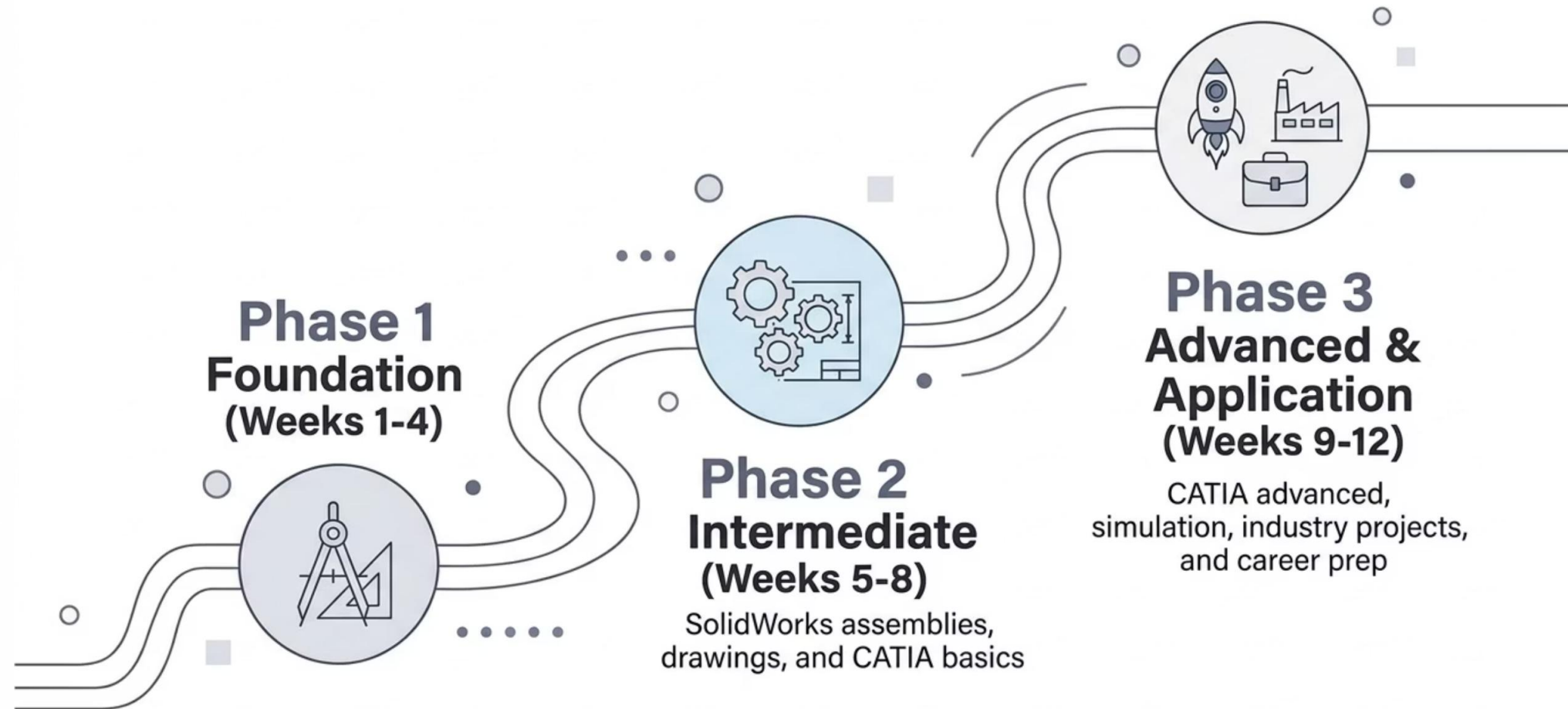
CATIA V5/V6

Dassault Systèmes' flagship platform for complex surface modeling and systems engineering. The tool of choice for Boeing, Airbus, Toyota, and other global OEMs demanding precision at scale.

- Advanced surfacing & Class-A
- DMU kinematics
- PLM integration

12-Week Program Roadmap

The course is structured in three progressive phases — each building directly on the last. Every week combines a concept-focused recorded session with a live mentoring session for doubt clearing and feedback.



Weekly Format

- Recorded session (concept + demo): 2–3 hrs
- Live mentoring (Q&A + case review): 1 hr
- Assignments + mini-project per phase

Assessment Method

- Weekly practical exercises
- Phase-end mini projects
- Final capstone: multi-tool design project

PHASE 1 · WEEKS 1–4

Foundation Phase: AutoCAD & SolidWorks Essentials

The foundation phase builds the non-negotiable bedrock of CAD literacy. Learners master AutoCAD 2D drafting workflows before transitioning into parametric 3D modeling with SolidWorks. By Week 4, you will be able to create fully annotated engineering drawings ready for industry use.

1

Week 1 — AutoCAD Fundamentals

- Interface, workspace & command line navigation
- 2D drawing tools: Line, Arc, Circle, Polyline
- Layers, linetypes & object properties
- Coordinate systems: absolute, relative & polar
- Precision drafting with OSNAP & ORTHO
- Saving, printing & plot settings basics

2

Week 2 — AutoCAD Intermediate

- Editing commands: Trim, Extend, Offset, Mirror
- Blocks, attributes & dynamic blocks
- Dimensioning standards & annotation styles
- Layout space, viewports & title blocks
- Hatch patterns and region modeling
- Sheet sets and plotting to PDF/DWG

3

Week 3 — SolidWorks Introduction

- SolidWorks interface, feature manager & file types
- Sketch environment: constraints & relations
- Base features: Extrude, Revolve, Sweep
- Reference geometry: planes, axes & origin
- Design intent and parametric modeling concepts
- Part templates and document properties

4

Week 4 — SolidWorks Part Modeling

- Advanced features: Loft, Shell, Rib, Draft
- Fillet, chamfer & hole wizard
- Feature suppression and design tables
- Engineering drawing views & GD&T basics
- Bill of materials concepts in part context
- **Mini Project:** Annotated bracket drawing (AutoCAD) + SolidWorks part

PHASE 2 · WEEKS 5–8

Intermediate Phase: Assemblies, Drawings & CATIA Basics

The intermediate phase scales your skills from individual parts to full product assemblies and introduces CATIA V5 — the platform used by the world's largest engineering organizations. You will learn to build, document, and validate multi-component assemblies using industry-standard workflows.

1

Week 5 — SolidWorks Assemblies

- Assembly environment and mating strategies
- Standard mates: Coincident, Concentric, Distance
- Sub-assemblies and assembly hierarchy
- Interference detection and clearance verification
- Exploded views and animation basics
- Assembly performance: lightweight vs. resolved

2

Week 6 — SolidWorks Drawings & Simulation Intro

- Multi-sheet drawing creation from assemblies
- Section views, detail views & auxiliary views
- GD&T tolerancing per ASME Y14.5
- SolidWorks Simulation: static stress analysis setup
- Material assignment and fixture application
- Reading and interpreting FEA results

3

Week 7 — CATIA V5 Foundations

- CATIA interface, workbenches & navigation
- Part Design workbench: sketcher tools & pads
- Pocket, shaft, groove and edge fillet features
- Specification tree management
- CATIA vs SolidWorks: workflow differences
- Industry file formats: CATPart, CATProduct

4

Week 8 — CATIA Wireframe & Surface Design

- Generative Shape Design (GSD) workbench intro
- Wireframe tools: points, lines, planes, splines
- Basic surface creation: extrude, revolve, fill
- Surface joining, splitting and healing
- Hybrid modeling: solids + surfaces integration
- **Mini Project:** SolidWorks assembly + CATIA part model

PHASE 3 · WEEKS 9–12

Advanced & Application Phase: CATIA, Simulation & Industry Projects

The final phase elevates your skills to job-ready proficiency. You will tackle advanced CATIA surfacing, assembly design, kinematic simulations, and close the course with a multi-tool capstone project that mirrors real-world engineering deliverables expected from an entry-level CAD engineer.

1

Week 9 — CATIA Advanced Surfacing

- Class-A surface concepts and quality standards
- Freestyle surface shaping tools
- Surface continuity: G0, G1, G2 analysis
- Curvature analysis and surface quality checks
- Applying surfaces to automotive body panels
- Practical exercise: consumer product enclosure surfacing

2

Week 10 — CATIA Assembly & DMU Kinematics

- Assembly Design workbench constraints and best practices
- Product structure and CATProduct management
- Digital Mock-Up (DMU) overview
- Kinematics: defining joints and simulating motion
- Clash detection and sweep volume analysis
- Industry application: mechanism simulation for aerospace

3

Week 11 — Simulation, Validation & Workflows

- SolidWorks Simulation: thermal and fatigue analysis
- CATIA FEM workbench introduction
- Design validation workflow: from CAD to FEA
- Design for Manufacturability (DFM) principles
- PDM/PLM concepts and version control basics
- Preparing models for manufacturing handoff

4

Week 12 — Capstone Project & Career Prep

- **Capstone:** Multi-tool design project — from 2D AutoCAD drawing to SolidWorks part/assembly to CATIA surfacing
- Presentation & demo of final project
- Portfolio building: GitHub, GrabCAD, and Behance tips
- Resume and LinkedIn profile optimization for CAD roles
- Interview prep: technical questions and design walk-throughs
- Career roadmap and next-step certifications

INDUSTRY EXAMPLE 1

Automotive Supplier: Bracket Redesign Using SolidWorks

The Business Problem

A Tier-1 automotive supplier was experiencing repeated field failures on an engine mount bracket — a warranty claim rate 3× above acceptable thresholds. The existing design had been drafted in legacy 2D AutoCAD with no simulation validation, and tooling decisions were being made purely from experience.

How CAD Skills Were Applied

- Legacy AutoCAD drawings were re-created as parametric SolidWorks part models
- Assembly constraints were used to validate fit and tolerance stack-up
- SolidWorks Simulation (FEA) identified a stress concentration at a corner fillet
- Design was iterated digitally — increasing fillet radius and adding a rib — without building physical prototypes
- Final validated drawings were generated directly from the SolidWorks model

Tools Used

- AutoCAD (reference drawing reconstruction)
- SolidWorks Part & Assembly Design
- SolidWorks Simulation (static FEA)

Business Impact

- Warranty claim rate reduced by 78% in 6 months
- Eliminated 2 physical prototype iterations
- Saved ~\$40,000 in tooling and testing costs

Role of Early Professionals

Junior CAD engineers owned the 3D model creation, ran initial FEA setups, and documented design changes — directly contributing to the final approved design.

INDUSTRY EXAMPLE 2

Aerospace OEM: Wing Rib Design Using CATIA V5

The Business Problem

A regional aircraft manufacturer needed to redesign a series of wing rib components to reduce weight by 15% while maintaining structural certification margins under FAR Part 25 requirements. Design-to-certification timelines were under intense pressure due to a new program launch schedule.

How CATIA Skills Were Applied

- Part Design workbench used for parametric rib modeling with embedded design tables for size variants
- GSD surfacing tools defined precise skin-following contours matching wing OML (Outer Mold Line)
- DMU Kinematics validated flap mechanism clearance against redesigned ribs
- CATIA FEM performed preliminary structural sizing before handing off to full NASTRAN analysis
- CATProduct assemblies managed hundreds of fastener positions and produced automated BOM reports

Tools Used

- CATIA V5 Part Design & GSD
- CATIA DMU Kinematics & Clash Detection
- CATIA FEM (preliminary sizing)
- ENOVIA for PLM / version control

Business Impact

- Target weight reduction of 15% achieved and certified
- Design cycle reduced by 4 weeks vs. prior programs
- Zero major design revision cycles after freeze gate

Role of Early Professionals

Entry-level design engineers managed individual rib variants, ran clash detections, and maintained the CATProduct structure — gaining direct exposure to program-level PLM workflows.

INDUSTRY EXAMPLE 3

Consumer Electronics: Product Enclosure Design Using SolidWorks & AutoCAD

The Business Problem

A mid-sized consumer electronics company was developing a new IoT device enclosure. The industrial design team had concept sketches, but the mechanical engineering team needed to translate those into manufacturable plastic parts — on a tight 10-week NPI (New Product Introduction) schedule.

How CAD Skills Were Applied

- AutoCAD used for initial 2D layout of PCB footprint and internal component spacing
- SolidWorks Shell and Draft features applied to create injection-molding-ready wall thicknesses
- Snap-fit latch features designed using parametric sketches and verified through motion studies
- SolidWorks Plastics (Mold Flow) simulation identified potential sink marks and weld lines before tooling was cut
- Full assembly validated for IP54 sealing compliance using gap analysis tools

Tools Used

- AutoCAD (layout planning)
- SolidWorks Part & Assembly
- SolidWorks Plastics (injection simulation)
- SolidWorks Motion Study

Business Impact

- Tooling release on schedule — zero date slippage
- Identified and resolved 3 critical mold flow defects before production
- Saved ~\$25,000 in mold rework costs

Role of Early Professionals

Junior mechanical engineers owned the SolidWorks modeling and ran the plastics simulations independently, presenting results in design review meetings attended by senior leadership.

SKILLS MAPPING

From Beginner to Job-Ready: Your Skill Progression

This course is designed with a deliberate skill progression that mirrors what employers expect at each stage of a junior engineer's career. Use this map to benchmark your development and identify where to focus your energy at each phase.



Beginner

- 2D AutoCAD drafting
- Basic SolidWorks part modeling
- Understanding file types & formats
- Reading engineering drawings
- Following design templates



Intermediate

- SolidWorks assemblies & drawings
- GD&T and tolerance analysis
- Intro FEA with SolidWorks Simulation
- CATIA Part Design & surfacing basics
- DFM principles in modeling



Job-Ready

- CATIA advanced surfacing & DMU
- Multi-tool workflow integration
- Simulation-driven design decisions
- PLM/PDM version control basics
- Portfolio with capstone project

CAREER ALIGNMENT

Job Roles This Course Prepares You For

Completing this program positions you for a broad range of entry-level and junior-level roles across high-demand engineering sectors. Each role below maps directly to the tools and workflows covered in the curriculum.



CAD Drafter / Designer

Creates technical drawings and 2D layouts for manufacturing, construction, or product documentation. Primary tools: AutoCAD, SolidWorks Drawings.



Mechanical Design Engineer

Designs parts and assemblies for manufactured products. Validates designs through simulation. Primary tools: SolidWorks, CATIA Part Design.



Aerospace Structures Designer

Creates structural components for aircraft and spacecraft programs. Works within PLM environments. Primary tools: CATIA V5/V6, ENOVIA.



Automotive Body Designer

Develops exterior and interior surface geometry to Class-A standards. Primary tools: CATIA GSD, ICEM Surf, SolidWorks.



Product Design Engineer

Bridges industrial design concepts with engineering requirements for consumer and industrial products. Primary tools: SolidWorks, AutoCAD.



CAE / Simulation Analyst

Runs structural, thermal, and fluid simulations to validate designs before prototyping. Entry path via SolidWorks Simulation into ANSYS or Abaqus.

How You'll Be Evaluated: Projects & Presentations

Each phase concludes with a practical deliverable that simulates real engineering work. Assessments are designed to be portfolio-worthy — artifacts you can present directly to employers as evidence of your skills.

Phase 1 Mini Project

AutoCAD: Fully annotated floor-plan or mechanical component drawing with proper layers, dimensions, and title block.

SolidWorks: Parametric part model with engineering drawing (3 views + section).

Phase 3 Capstone

Multi-tool project: Real-world inspired design challenge spanning AutoCAD layout → SolidWorks structural design → CATIA surface finishing. Includes a 10-minute demo presentation defending design decisions.



- ❑ **Presentation Expectation:** The capstone demo must include a narrated walkthrough of your design process, key decisions made, simulation results reviewed, and how your design meets the given requirements. This mirrors a real design review meeting.

KEY TAKEAWAYS

What You'll Walk Away With

After 12 weeks of structured learning, hands-on practice, live mentoring, and project work, here is what you will have concretely achieved — skills, deliverables, and a clear forward path.



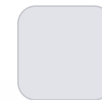
Three-Platform Proficiency

Demonstrated, practical skill in AutoCAD (2D drafting), SolidWorks (3D modeling + FEA), and CATIA (advanced surfacing + DMU) — the three most in-demand CAD platforms in the engineering job market today.



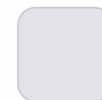
Industry Workflow Fluency

Exposure to real engineering workflows — DFM principles, GD&T tolerancing, FEA interpretation, PLM/PDM concepts — so you can hit the ground running in an actual engineering team from day one.



A Portfolio-Ready Project Set

Three graded deliverables (Phase 1, Phase 2, and the Capstone) that are professionally presented and ready to upload to GrabCAD, Behance, or attach to job applications — making your skills immediately visible to recruiters.



A Clear Career Roadmap

Mapped job roles, recommended next certifications (CSWA, CATIA Associate, Autodesk Certified User), and a personalized next-step plan reviewed during your final mentoring session.

Your Path After Completing the Course

Completing this course is a launchpad, not a finish line. Here is the recommended progression for turning your new skills into a successful engineering career — with clear milestones for the first 12 months after graduation.



Recommended Certifications

- **CSWA** — Certified SolidWorks Associate (Dassault)
- **ACU** — Autodesk Certified User: AutoCAD
- **CATIA Associate** — Dassault Systèmes credential
- **CSWP** — Certified SolidWorks Professional (next level)

Platforms to Stay Sharp

- GrabCAD — share models and follow industry designers
- LinkedIn Learning — advanced simulation courses
- MySolidWorks — official SolidWorks training portal
- 3DS Academy — official CATIA learning resources