Coincent
Learning Drives Excellence

Coincent 3 Year Program Curriculum

AutoCAD, Catia, Ansys

Partnered by

AnisoTech

Empowering Learners,
Accelerating Careers.

coincent.ai

ABOUT COINCENT

Coincent offers a 3-Year Program that is a well-structured, career-focused initiative designed to equip students with practical skills, real-world experience, and strong placement support. The program is tailored to ensure progressive learning and career readiness across three year phases.

Why It's Unique

- Only one batch per year with limited seats (150 students) per Domain to maintain quality.
- Prepares students step-by-step to become job-ready by graduation.

DETAILED ABOUT COINCENT 3 YEAR AutoCAD, Catia, Ansys PROGRAM

“AutoCAD, Catia, Ansys Program at Coincent - Learn by Doing”

Coincent's **ANSYS Program** is designed to help students gain practical expertise in engineering simulation and analysis through live training, guided practice, and hands-on projects. Students learn finite element analysis (FEA) and simulation techniques in a simple, structured, and application-oriented manner.

The program covers **part design, assembly design, surface modeling, sheet metal design, drafting, product modeling, and design validation**, while giving students practical exposure through assignments and industry-based projects.

Here, mentors from top MNC’s will guide you and assist you through the sessions and live projects, training etc.

3- Year Program Structure Breakdown

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Benefits and Outputs
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Year 1: Industrial Training

"Before going to the curriculum preparation, Let's see the Basic Intro about **AutoCAD, Catia, Ansys** and how coincent is going to deep dive into its chapters"

What makes this program unique is

- it runs **parallel to your college academics**, allowing you to learn, apply, and grow without compromising your education.
- Through hands-on projects, certifications, real-world mentorship, and a clear yearly progression — you'll be industry-ready by the time you graduate.

Program Overview

What is **AutoCAD, Catia, Ansys** and why it's important?

AutoCAD, CATIA, and ANSYS are three of the most widely used engineering software tools across industries such as automotive, aerospace, civil, mechanical, manufacturing, and product design. Together, these tools enable engineers to design, develop, test, and optimize products digitally, reducing development time, manufacturing costs, and design errors.

Importance of AutoCAD, Catia & Ansys

- **Industry-Standard Engineering Software**

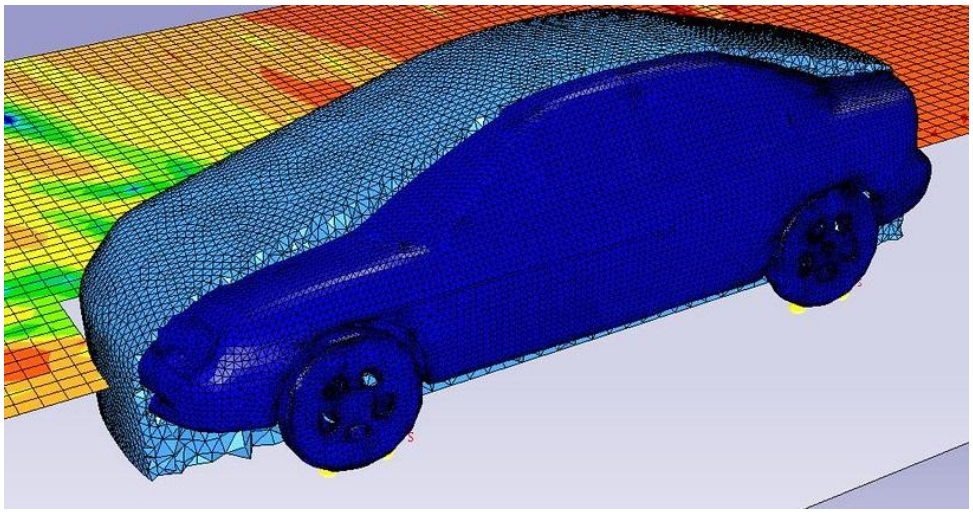
  AutoCAD, CATIA, and ANSYS are globally recognized tools used across the automotive, aerospace, manufacturing, construction, and product design industries for drafting, 3D modeling, product development, and engineering simulation.

- **Enhances Design Accuracy & Engineering Efficiency**

  These software help engineers create precise designs, develop complex 3D models, perform simulations, and validate product performance, reducing design errors, development time, and overall project costs.

- **Used in Real-World Engineering Projects**

  AutoCAD, CATIA, and ANSYS are extensively used for designing buildings, mechanical components, vehicles, aircraft, industrial equipment, and infrastructure while testing their strength, durability, and performance.



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Chapter – 1: Introduction to CATIA

1.1 Introduction to CATIA

- Overview of CATIA.
- Understanding the CATIA workspace.
- Introduction to Computer-Aided Design (CAD).

1.2 Sketching

- Creating basic 2D sketches.
- Using sketch tools.
- Applying basic constraints.

1.3 3D Modeling

- Creating simple 3D models from sketches.
- Introduction to Part Design.

Benefits and Outputs:

- Understand the basics of CATIA.
- Create simple 2D sketches.
- Build basic 3D models using CATIA.

Chapter 2: Basics of CATIA

2.1 CATIA Workbenches

- Introduction to CATIA workbenches.
- **Sketcher** – Creating 2D sketches.
- **Part Design** – Developing 3D parts.
- **Assembly Design** – Assembling multiple components.
- **Surface Design** – Creating surface models.
- **Generative Drafting** – Preparing 2D drawings from 3D models.

2.2 CATIA Interface

- File Toolbar.
- Menu Bar.
- Application Toolbar.
- View Toolbar.

2.3 Applications of CATIA

- Furniture Design.
- Construction.

- Aerospace Engineering.
- Automotive Design.

Benefits and Outputs:

- Identify the main CATIA workbenches.
- Navigate the CATIA interface.
- Understand the basic applications of CATIA in different industries.

Chapter 3: Sketcher

3.1 Sketcher Interface

- Introduction to the Sketcher workspace.
- Understanding the Sketcher tools and layout.

3.2 Coordinate System

- Understanding the X, Y, and Z coordinate system.
- Positioning and creating sketches accurately.

3.3 Profile Toolbar

- Creating basic sketch profiles.
- Using line, circle, rectangle, and other profile tools.

3.4 Operations Toolbar

- Editing and modifying sketches.
- Applying basic sketch operations.

3.5 Constraints

- Applying geometric and dimensional constraints.
- Maintaining accurate and fully defined sketches.

Benefits and Outputs:

- Navigate the Sketcher interface.
- Create basic 2D sketches.
- Use profile and operation tools.
- Apply constraints to create accurate sketches

Chapter 4: Part Modeling

4.1 Basic Features

- Creating **Pad**, **Drafted Pad**, and **Multi-Pad** features.
- Building 3D parts from 2D sketches.

4.2 Material Removal Features

- Creating **Pocket**, **Shaft**, **Groove**, and **Hole** features.
- Modifying parts by adding or removing material.

4.3 Advanced Features

- Using **Rib**, **Slot**, **Solid Combine**, **Stiffener**, and **Multi Section Solid**.
- Creating complex part geometries.

4.4 Dress-Up Features

- Applying **Edge Fillet**, **Tritangent Fillet**, and **Draft Angle**.
- Improving the shape and finish of 3D models.

Benefits and Outputs:

- Create basic and advanced 3D parts.
- Apply material addition and removal features.
- Use dress-up features to refine part models.
- Develop complete 3D components using CATIA Part Design.

Chapter – 5: Assembly Modeling

5.1 Introduction to Assembly Modeling

- Overview of assembly design in CATIA.
- Understanding the assembly workspace.

5.2 Assembly Constraints

- Applying **Fixed** and **Angle** constraints.
- Positioning and aligning components.

5.3 Assembly Exercise

- Creating a **Wheel Support Assembly**.
- Assembling multiple parts into a complete model.

Benefits and Outputs:

- Understand the basics of assembly modeling.
- Apply assembly constraints.
- Create simple product assemblies in CATIA.

Chapter 6: Introduction to ANSYS

6.1 Introduction to ANSYS

- Overview of ANSYS software.
- Introduction to engineering simulation.

6.2 Finite Element Method (FEM)

- Basics of the Finite Element Method.
- Understanding simulation concepts.

6.3 Applications of ANSYS

- Structural analysis.
- Thermal analysis.
- Fluid dynamics.
- Automotive and aerospace applications.

6.4 ANSYS Interface

- Introduction to the ANSYS workspace.
- Working with Cells.
- Understanding the Menu Bar.

Benefits and Outputs:

- Understand the basics of ANSYS.
- Learn the fundamentals of the Finite Element Method (FEM).
- Identify common engineering applications of ANSYS.
- Navigate the ANSYS interface and workspa

Chapter 7: Truss Analysis

7.1 Truss Modeling

- Introduction to truss structures.
- Creating a truss model in ANSYS Workbench.
- Defining material properties and supports.

7.2 Static Structural Analysis

- Applying loads and boundary conditions.
- Performing static structural analysis.
- Evaluating deformation and joint deflection.

Benefits and Outputs:

- Create a basic truss model in ANSYS Workbench.
- Apply loads and support conditions.
- Perform static structural analysis.
- Interpret deformation and displacement results.

Chapter 8: Frame Analysis

8.1 Frame Modeling

- Introduction to frame structures.
- Creating a frame model in ANSYS Workbench.
- Defining material properties and supports.

8.2 Structural Analysis

- Applying pressure and distributed loads.
- Performing structural analysis.
- Evaluating deformation and stress distribution.

Benefits and Outputs:

- Model basic frame structures.
- Apply structural loads in ANSYS.
- Analyze deformation and stress results.
- Understand the structural behaviour of frame systems.

Chapter 9: Chassis Analysis

9.1 Structural Analysis

- Introduction to chassis analysis.
- Evaluating stress and deformation.

9.2 Vibration and Fatigue

- Understanding vibration analysis.
- Assessing fatigue performance.

9.3 Crashworthiness

- Introduction to impact analysis.
- Evaluating chassis safety under loading conditions.

9.4 Design Optimization

- Improving chassis design through material and geometry optimization.
- Enhancing strength and performance.

Benefits and Outputs:

- Understand the basics of chassis analysis.
- Perform structural and vibration analysis.
- Evaluate chassis performance under different loading conditions.
- Understand basic design optimization concepts.

Chapter 10: AutoCAD Interface and Basics

10.1 Introduction to AutoCAD

- Overview of AutoCAD and CAD concepts.
- Understanding AutoCAD applications in engineering and design.
- Introduction to 2D drafting.

10.2 Career Opportunities

- Mechanical Drafting.
- Architectural Drafting.
- Civil Drafting.
- Electrical Drafting.
- Interior Drafting.

10.3 AutoCAD Interface

- Menu Browser and Quick Access Toolbar.
- Ribbon and Menu Bar.
- Command Line and Drawing Area.
- Navigation and Status Bar.
- Enhancing strength and performance.

Benefits and Outputs:

- Understand the basics of AutoCAD.
- Navigate the AutoCAD interface.
- Identify career opportunities in CAD drafting.

Chapter 11: Draw Commands

11.1 Line

- Creating straight lines.
- Understanding basic drawing techniques.

11.2 Circle

- Drawing circles using different methods.
- Creating circular objects.

11.3 Polyline

- Creating connected lines and arcs.
- Editing polyline objects.

11.4 Rectangle

- Drawing rectangular shapes.
- Creating basic layouts and sketches.

Benefits and Outputs:

- Use basic AutoCAD drawing commands.
- Create simple 2D drawings.
- Develop engineering sketches using Line, Circle, Polyline, and Rectangle commands.
- Build the foundation for advanced drafting techniques.

Chapter 12: Modify Commands

12.1 Move

- Moving objects to a new location.
- Using base and destination points.

12.2 Trim

- Removing unwanted portions of objects.
- Cleaning up drawing intersections.

12.3 Offset

- Creating parallel lines and curves.
- Applying offset distances.

12.4 Mirror

- Creating symmetrical copies of objects.
- Using mirror axes for accurate drafting.

Benefits and Outputs:

- Modify existing drawings using basic editing commands.
- Create accurate and efficient design layouts.
- Improve drafting productivity with editing tools.

Chapter 13: Annotation and Dimension Style Manager

13.1 Dimension Styles

- Creating and modifying dimension styles.
- Customizing text, arrows, and symbols.

13.2 Dimension Settings

- Setting units, precision, and scale.
- Applying dimensions to drawings.

13.3 Style Management

- Maintaining consistent dimension styles.
- Using multiple styles for different drawings.

Benefits and Outputs:

- Create and manage dimension styles.
- Apply accurate dimensions to drawings.
- Maintain consistency in engineering documentation.

Chapter 14: Layers and Blocks

14.1 Layers

- Creating and managing layers.
- Controlling object visibility and properties..

14.2 Blocks

- Creating reusable block objects.
- Inserting and editing blocks..

14.3 Layer Management

- Organizing drawings using layers.
- Improving drafting workflow..

14.4 Block Libraries

- Creating and using block libraries.
- Standardizing common drawing elements..

Benefits and Outputs:

- Organize drawings using layers.
- Create and use reusable blocks.
- Improve drawing efficiency through layer and block management.

Chapter 15: Isometric Views

15.1 Introduction to Isometric Views

- Understanding isometric drawing concepts.
- Creating 3D-like representations in 2D.

15.2 Isometric Planes

- Switching between isometric planes.
- Drawing on Top, Left, and Right isoplanes.

15.3 Isometric Grid

- Using the isometric grid for accurate drafting.
- Aligning objects in isometric view.

15.4 Applications of Isometric Drawing

- Creating technical and engineering drawings.
- Representing components and assemblies.

Benefits and Outputs:

- Create basic isometric drawings.
- Use isometric grids and planes effectively.
- Develop technical drawings with improved visualization.

Chapter 16: Modeling Commands

16.1 Extrude

- Creating 3D objects from 2D sketches.
- Applying extrusion to solid models.

16.2 Revolve

- Creating 3D models by rotating profiles.
- Designing symmetrical components.

16.3 Loft

- Creating smooth 3D shapes using multiple profiles.
- Understanding profile transitions.

16.4 Sweep

- Creating 3D objects along a defined path.
- Developing curved and pipe-like models.

Benefits and Outputs:

- Create basic 3D models using AutoCAD.
- Apply Extrude, Revolve, Loft, and Sweep commands.
- Develop simple engineering components.

Chapter 17: Generating 3D Diagrams

17.1 3D Viewports

- Viewing models from different angles.
- Using multiple viewports for better visualization.

17.2 Shading and Rendering

- Applying visual styles to 3D models.
- Using shading and rendering for realistic presentation.

Benefits and Outputs:

- Understand Visualize 3D models from different perspectives.
- Apply shading and rendering techniques.
- Create presentation-ready 3D diagrams.

Chapter 18: Solid Editing Tools

18.1 Fillet

- Rounding edges of 3D solids.

18.2 Chamfer

- Converting solid models into hollow objects.

18.3 Shell

- Converting solid models into hollow objects.

18.4 Boolean Operations

- Using **Union**, **Subtract**, and **Intersect** to modify solids.

Benefits and Outputs:

- Edit and refine 3D solid models.
- Apply Fillet, Chamfer, and Shell commands.
- Use Boolean operations to create complex models.

Chapter 19: Practical Exercise

19.1 Modeling a Screw Jack

- Introduction to screw jack components.
- Creating individual 3D parts.
- Assembling the complete screw jack model.
- Applying modeling and editing commands.

Benefits and Outputs:

- Develop a complete 3D mechanical model.
- Apply AutoCAD modeling and editing tools in a practical project.
- Create engineering models suitable for design visualization and documentation.

Year 2 :- Application & Project Phase:

– Year 2 is full of hands-on-experience on 7 live projects –

CAPSTONE PROJECTS

Project 1 - Static Structural Analysis of Spur Gear using ANSYS

- A spur gear is a mechanical component used to transmit motion and torque between parallel shafts in various machines.
- Model the spur gear using CATIA and assign suitable engineering materials.
- Perform static structural analysis in ANSYS to evaluate stress and deformation under different loading conditions and compare the results for material selection.

Project 2 - Modeling of Oldham's Coupling using AutoCAD 3D

- Oldham's Coupling is used to connect two parallel shafts while accommodating slight misalignment.
- Create the individual coupling components, including the base discs and sliding member, using AutoCAD 3D.

- Assemble the complete model and verify proper alignment, fit, and functional movement of the coupling.

Project 3 - Modeling and Structural Analysis of Screw Jack

- Screw Jack is a type of Jack that is operated by turning a lead screw.
- It is commonly used to lift moderately heavy weights, such as vehicles; to raise and lower the horizontal stabilisers of aircraft; and as adjustable supports for heavy loads, such as foundation of houses.

Project 4 - Structural and Modal Analysis of Composite Leaf Spring

- The static structural and modal analysis is carried out on the steel multi leaf spring, Carbon epoxy and S-Glass Epoxy leaf springs using ANSYS.
- Same dimensions are used in composite multi leaf spring using Carbon Epoxy, S-Glass Epoxy undirectional laminates.
- The load carrying capacity and weight of composite leaf spring are compared with that of steel leaf spring

Project 5 - Modeling of Stuffing Box using CATIA

- A stuffing box is a sealing device used to prevent fluid leakage around rotating or reciprocating shafts.
- Design the stuffing box and its major components using CATIA Part Design.
- Assemble the complete model and validate the design for proper fit, sealing performance, and manufacturability.

Project 6 - Modeling & Structural Analysis of Composite Helical Spring

- The suspension system is used to observe the vibrations from shock loads due to irregularities of the road surface.
- Generally, for light vehicles, coil springs are used as suspension system.
- A spring is an elastic object used to store mechanical energy and it can be twisted, pulled or stretched by some force and can return to their original shape when force is released

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Project 7 - Static Structural Analysis of Conventional Sugar Mill Roller Shaft

- A sugar mill roller shaft is a key component used to crush sugarcane and transmit heavy loads in sugar processing industries.
- Create the roller shaft model and assign appropriate material properties in ANSYS.
- Perform static structural analysis to evaluate stress and deformation, and compare material performance to optimize the design.

Year 3 – Placement & Internship Phase:

1. Guaranteed Internship Phase

- In Year 3, Coincent guarantees an internship with partner companies for every student at no extra cost. The internship includes a formal Internship Offer Letter and a Completion Certificate upon successful completion.
- This is part of their "Industrial Training + Internship" model — training fees cover live classes, mentorship, and project work, but the internship phase itself is completely complimentary

2. Structured Placement Preparation

- Coincent supports students in portfolio-building with multiple completed projects (typically around 8+) and Microsoft-aligned certifications.
- They provide mock interviews, resume reviews, and training for HR and technical rounds — all aimed at preparing you for real-world hiring.

3. Final Take

- Coincent's 3rd year transforms theory into practical experience through a guaranteed internship, builds a robust credentials portfolio, and equips you with placement-ready skills via mock interviews and resume prep. If you're in your 4th year, this phase sets you on a clear trajectory from "training" to "hired."

Step Into Top Tech Roles

The top career opportunities for professionals skilled in **AutoCAD, CATIA, and ANSYS** span the fields of product design, manufacturing, automotive, aerospace, construction, and engineering analysis. Some of the key roles include:

- **CAD Design Engineer:** Creates detailed 2D drawings and 3D models using AutoCAD and CATIA for product development, manufacturing, and engineering documentation.
- **Mechanical Design Engineer:** Designs mechanical components and assemblies using CATIA while ensuring functionality, manufacturability, and compliance with engineering standards.
- **CAE Analysis Engineer:** Performs structural, thermal, and fatigue analysis using ANSYS to evaluate product performance, optimize designs, and improve reliability.
- **Product Design Engineer:** Develops innovative mechanical products by combining 3D modeling, assembly design, and engineering simulation tools.

- **AD Draftsman:** Prepares technical drawings, production layouts, and manufacturing documentation using AutoCAD for mechanical, civil, and industrial applications.
- **Automotive Design Engineer:** Designs and validates automotive components using CATIA and ANSYS, focusing on performance, safety, and durability.
- **Aerospace Design Engineer:** Develops aircraft components and assemblies using CATIA and performs engineering simulations in ANSYS for structural validation.
- **Simulation Engineer:** Conducts finite element analysis (FEA) using ANSYS to analyze stress, deformation, vibration, and material behavior under different operating conditions.
- **Tool and Die Design Engineer:** Designs manufacturing tools, dies, molds, and fixtures using CATIA and AutoCAD to support production processes.
- **R&D Design Engineer:** Works on product innovation, prototype development, and engineering optimization by integrating CAD modeling and simulation techniques.