University Mohamed Boudiaf of M'Sila
Faculty of Technology,
Common Technology Base – 2eme GCE

Computer-Aided Design (CAD)

«Dessin Assisté Par Ordinateur (DAO)»

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Chapter 1

Introduction to AutoCAD Software

1.1 Introduction and History of CAD;

1.2 AutoCAD Interface;

1.3 Configuring AutoCAD Software;

1.4 AutoCAD Software Reference Elements;

1.5 Saving AutoCAD Files;

1.6 Communication and Interdependence Between AutoCAD Files.

1.1 Introduction et historique du DAO

1.1.1. Definition and Role

Computer-Aided Design (CAD) is a discipline that involves producing technical drawings, plans, diagrams, and assemblies using computer software. It is a precision tool that is gradually replacing manual drawing with pencil and traditional instruments (set square, ruler, compass, etc.).CAD allows for the creation of highly accurate 2D drawings (building plans, electrical diagrams, mechanical drawings, etc.) and facilitates the management of modifications, copies, archives, and the exchange of digital documents.

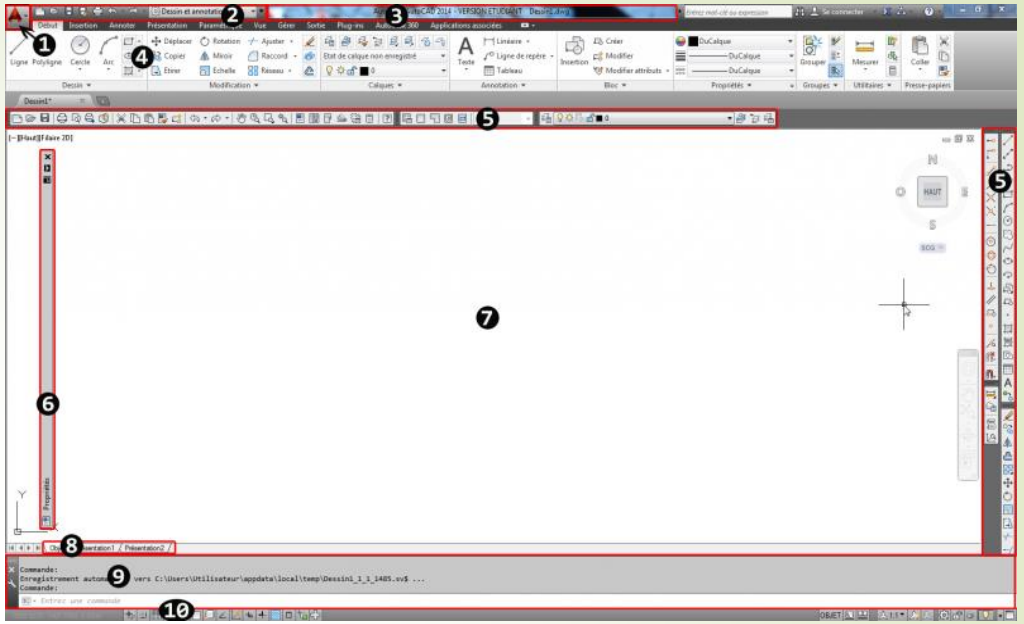
1.1 Introduction et historique du DAO

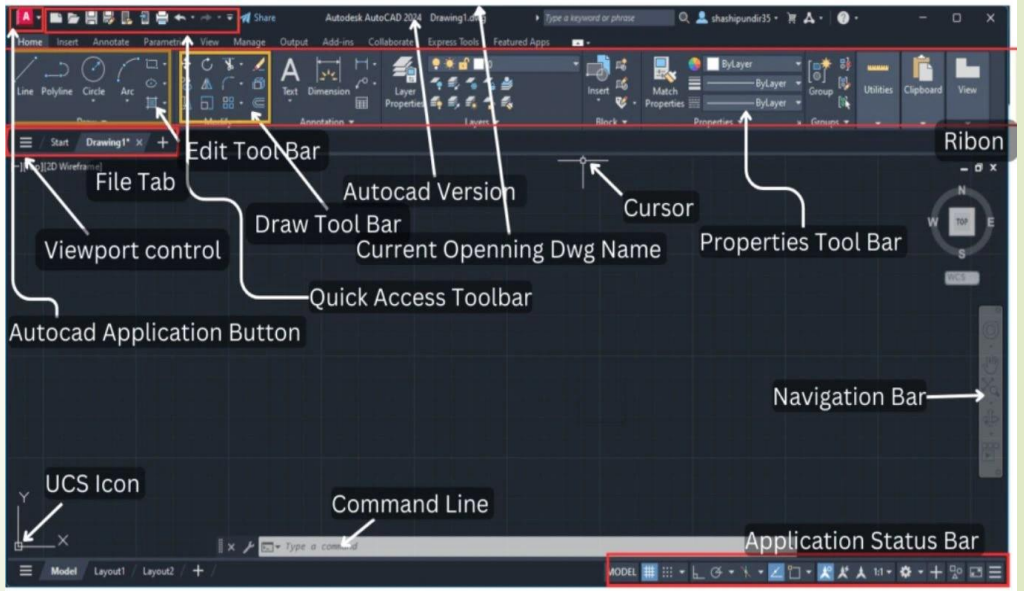
1.1.2. History and Evolution

- 1960s–1970s: The first computer-aided design (CAD) systems appeared in the aerospace and automotive industries, notably with software such as SketchPad (MIT, 1963) or proprietary systems used by large companies.
- 1982: Autodesk launched AutoCAD, which quickly became a standard for 2D CAD in several fields (architecture, construction, mechanical engineering, electrical engineering).
- 1990s–2000s: CAD became widespread in engineering firms, schools, and design offices. Software programs incorporated symbol libraries, drawing standards, and version control tools.
- 2000–present: CAD is evolving towards integrated environments (CAD/CAM) and is becoming integrated into project management (BIM, PLM, etc.), with strong interoperability between software and file formats (DWG, DXF, PDF, etc.).

1.2 AutoCAD Interface

AutoCAD is one of the CAD drawing solutions with a simple interface. Users with minimal experience can navigate quickly and easily through all sections and tools of the program.





1.2 AutoCAD Interface

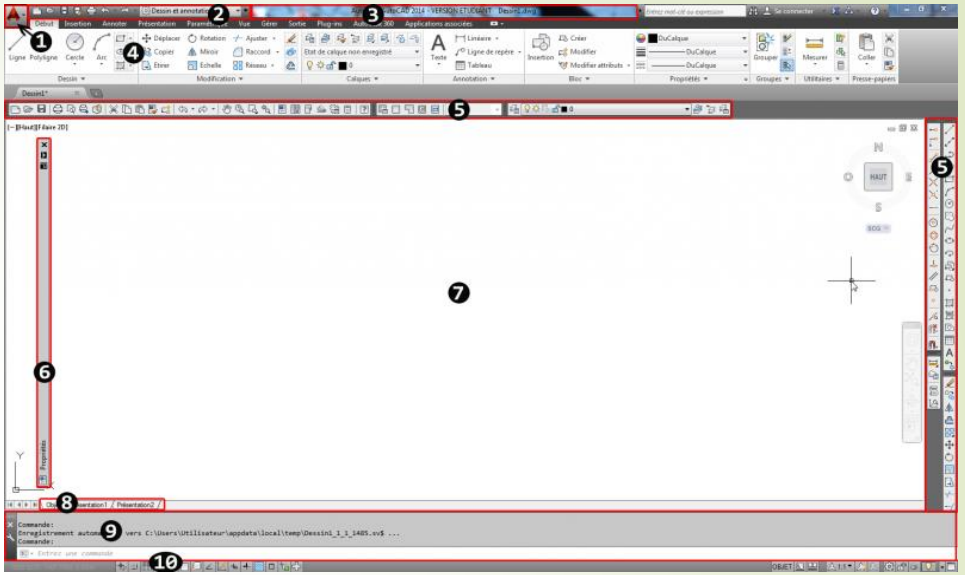
1.2.1 Screen Description

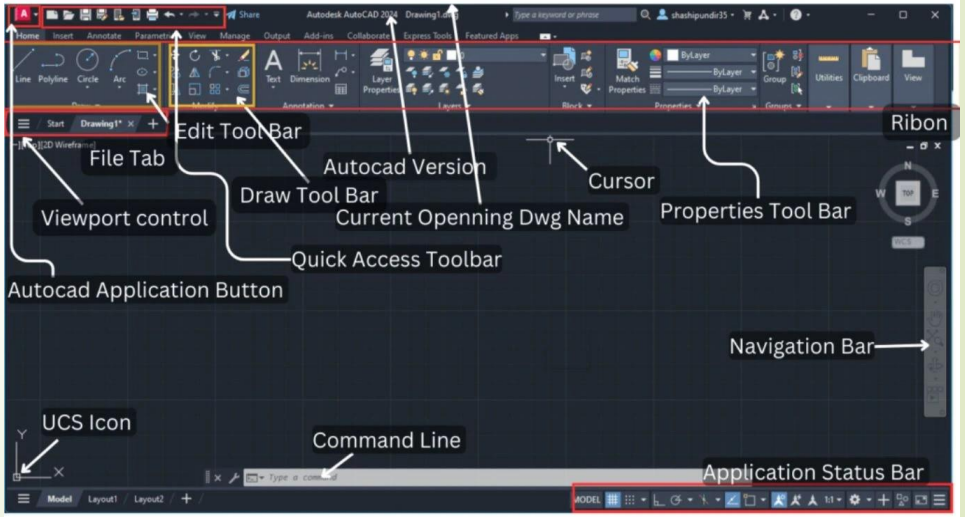
The main AutoCAD window consists of the following elements (Figures 1 and 2):

1- Application Menu Button (Button "A"): Provides access to file management options (New, Print, Export).

2- Quick Access Toolbar: Located in the upper left corner, it contains common functions such as "Save," "Open," and "Undo.“

3- Title Bar





1.2 AutoCAD Interface

1.2.1 Screen Description

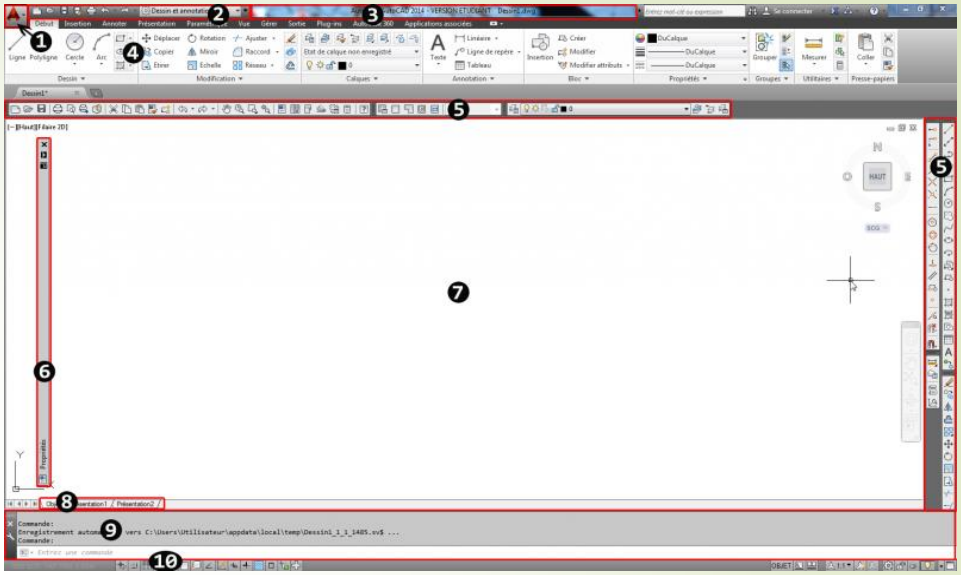
4- Ribbon: Located at the top, it organizes commands into tabs (e.g., Home, Insert, Annotate) and panels (e.g., Draw, Modify).

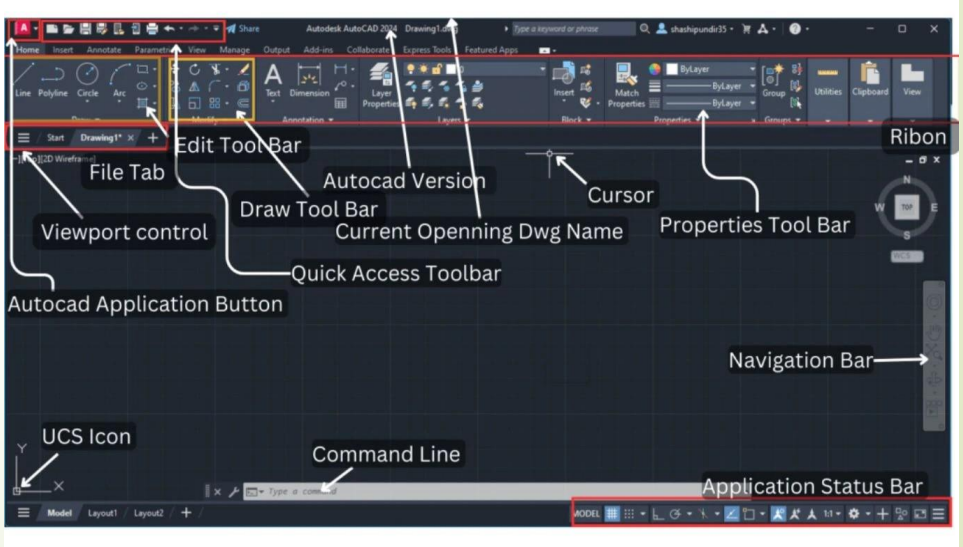
5- Docked toolbars

6- Palette

7- Drawing area (Graphics): The main, infinite workspace where you create and modify your objects.

8- Object and Layout tabs: Allow you to switch between different open drawings and between Model Space (design) and Paper Space (layout for printing).





1.2 AutoCAD Interface

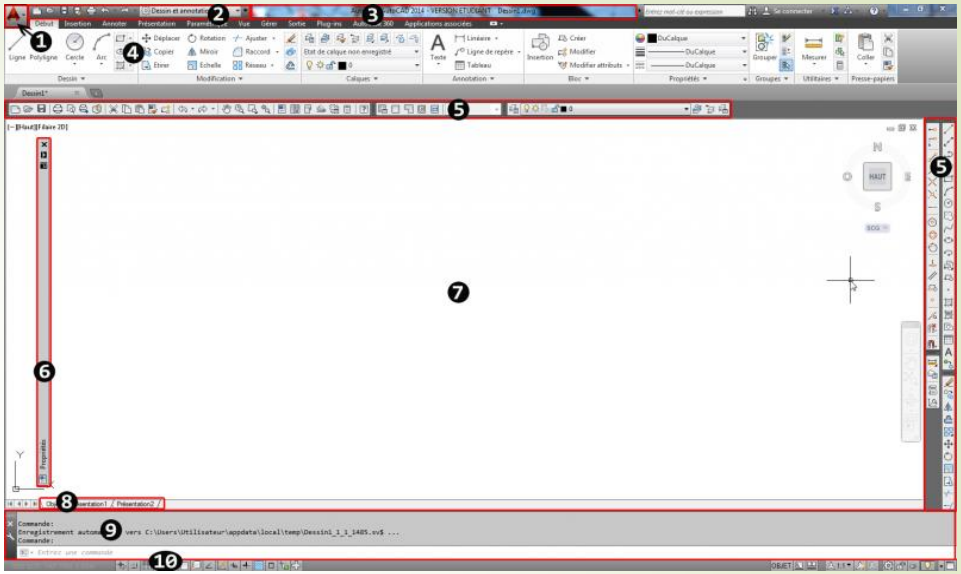
1.2.1 Screen Description

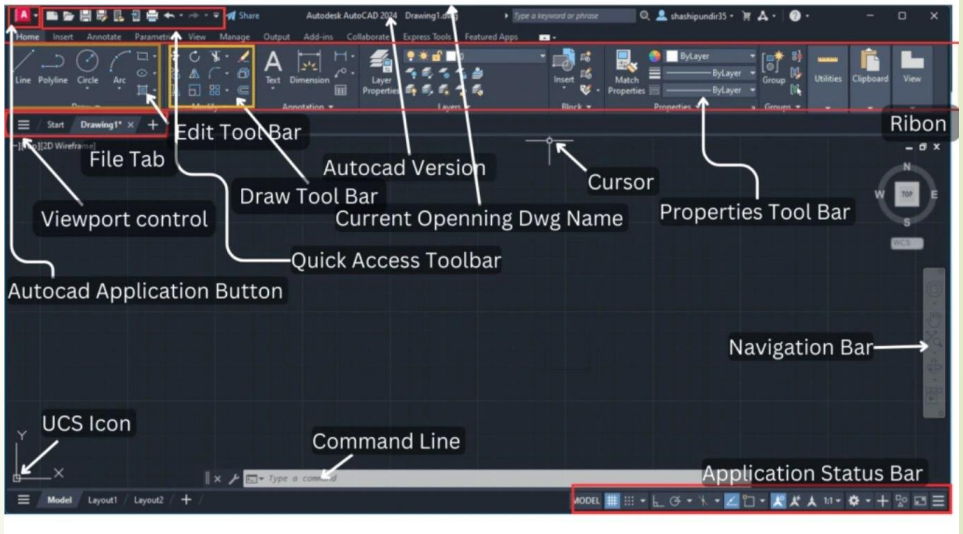
9- Command line: An interactive window at the bottom of the screen, essential for entering keyboard commands and responding to software prompts.

10- Status bar: Located at the very bottom, it allows you to quickly enable or disable drawing aids (Grid, Object Snap, Ortho Mode).

For more information, the reader can consult the website:

https://autocad.ccdmd.qc.ca/section/interface-graphique-dautocad-2014 .





1.2 AutoCAD Interface

1.2.2. How to access commands in detail?

Commands can be accessed through three well-defined methods, offering flexibility:

1. **Menu bar selection:** You can navigate the menu and select the desired option to access the specific commands associated with that selection.
2. **Toolbar access:** By clicking on a specific tool in the toolbar, you can quickly access its corresponding commands, providing a visual and direct approach.
3. **Direct command in the command line:** For maximum precision, enter the command directly in the command line, offering a fast and efficient way to access the specific features you need.

1.2 AutoCAD Interface

1.2.3. Aliases

There's a way to work faster: aliases (or commands and keyboard shortcuts)... Here are some examples of the most commonly used commands:.

Alias	Command	Description
L	Line	Creates a straight line segment.
C	Circle	Draws a circle.
REC	Rectangle	Draws a rectangle.
PO	Polyline	Creates a polyline (sequence of connected segments/arcs).
H	Hatch	Applies a hatch or pattern fill to a closed area.
DP	Move	Moves the selected objects.
CP	Copy	Copies the selected objects.
MI	Mirror	Creates a mirrored (symmetric) image of the objects.
RI	Rotate	Rotates the objects around a base point.
E	Stretch	Stretches or distorts objects by cross-selection.
AJ	Trim	Trims (cuts) objects until they reach other objects.
EF	Erase	Erases (deletes) the selected objects.

1.2 AutoCAD Interface

1.2.3. Aliases

a) Function Keys F1 to F12:

The 'F' keys are extremely important because they modify the behavior of AutoCAD. These keys should become second nature for students, as they greatly affect drafting productivity. The F1 to F12 keys are shortcuts to essential AutoCAD tools, allowing users to access the software's drawing aids.

Key	Function	Description
F1	Help	Opens AutoCAD's online help.
F2	Command Window	Displays/hides the text window (command history).
F3	Object Snap (OSNAP)	Toggles object snap on/off, allowing precise snapping to points (endpoints, midpoints, centers).
F4	3D Object Snap	Toggles 3D object snap on/off (for 3D drafting).
F5	Isoplane	Switches between isometric planes (Top, Right, Left) for 2D isometric drawing.
F6	Dynamic UCS (DUCS)	Toggles dynamic User Coordinate System on/off.
F7	Grid (GRID)	Displays/hides the grid of points or lines in the drawing area.
F8	Ortho (ORTHO)	Toggles Ortho mode on/off, constraining lines to horizontal/vertical (90° angles).
F9	Snap (SNAP)	Toggles grid snap on/off, constraining cursor movement to grid points.
F10	Polar (POLAR)	Toggles polar tracking on/off, allowing lines at predefined angles.
F11	Object Tracking (OTRACK)	Toggles object snap tracking on/off, enabling temporary alignment paths from snap points.
F12	Dynamic Input (DYNMODE)	Toggles dynamic input on/off, showing command prompts and dimensions near the cursor.

Thank you for your attention