

University Mohamed Boudiaf of M'Sila
Faculty of Technology,
Common Technology Base – 2nd CE



Computer-Aided Design (CAD)

«Dessin Assisté Par Ordinateur (DAO)»

By :
Dr. Guettouche Amar

2026

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.

1.3 Configuring AutoCAD Software

Configuring AutoCAD correctly saves time, prevents errors, and allows you to work in an environment suited to your field (architecture, building construction, mechanical engineering, etc.). Here are the key configuration steps, listed in logical order from installation to use.

1.3.1. Check the hardware configuration

Before installing AutoCAD, ensure that the computer meets Autodesk's minimum and recommended requirements:

- Operating System: Windows 10/11 (64-bit).
- Processor: multi-core (recommended: 2.5–3 GHz or higher).
- Memory (RAM): 8 GB minimum, 16 GB or more recommended.
- Graphics card: DirectX 11 compatible, minimum 2 GB VRAM, 4–8 GB recommended for large 3D drawings.
- Hard drive: SSD strongly recommended for better performance (6–10 GB of free space depending on the version).

1.3 Configuring AutoCAD Software

1.3.2. Installation and activation

- a) **Download** AutoCAD from the official Autodesk website (via an Autodesk account).
- b) **Launch** the installer and choose:
 - The installation folder (e.g., C:\Autodesk\AutoCAD 2025).
 - The optional components (fractions, maintenance tools, etc.).
- c) Launch AutoCAD after installation and activate the license:
 - Use a product key (perpetual license) or log in to an Autodesk account for a subscription license (free limited trial).

1.3 Configuring AutoCAD Software

1.3.3. Basic Parameter Configuration

Once AutoCAD is open, you must configure the basic parameters via the Options menu (Tools ⇒ Options).

A. Drawing Units

- **Launch** the **UNITS** (or **UN**) command or go to the **Drawing** tab in the **Options** menu.
- **Define:**
 - **Length Units:** Decimal (default), Architect, Engineer, etc.
 - **Precision:** 0.00 (mm) for building, 0.000 (mm) for mechanical, or 0.00m for large projects.
 - **Angle Units:** Degrees (0 to 360°) or Radians depending on the field.
 - **Zero Angle:** Generally towards the East (X-axis) in a counterclockwise direction.

1.3 Configuring AutoCAD Software

1.3.3. Basic Parameter Configuration

B. Drawing Environment

In the **Drawing** tab of **Options**:

- **Grid:** Adjust the grid spacing (e.g., 10 mm or 1 m depending on the scale) and decide whether it is always visible.
- **Snap:** Set the snap spacing (e.g., 10 mm for detail, 100 mm for overall).
- **The grid rotation angle** (if needed) and the size of the reference point (snap point).

C. User Coordinate System (UCS)

- Use the UCS command to define a local coordinate system suitable for a facade, a plan, etc.
- Manage multiple UCSs via UCSManagement (UCMS) to draw in outline for: architecture, mechanics, etc.

1.3 Configuring AutoCAD Software

1.3.4. Interface Customization

The interface must be adapted to the type of project (2D, 3D, architecture, mechanical).

A. Ribbon and Workspaces

- i. Choose a predefined workspace from the menu in the upper right corner (e.g., Drawing and Annotation for 2D, 3D Modeling).
- ii. Customize the ribbon:
 - Add or remove tabs (Home, Annotate, Insert, etc.).
 - Add specific groups (e.g., Dimensioning, Properties, Layers).

1.3 Configuring AutoCAD Software

1.3.4. Interface Customization

B. Toolbars and Palettes

- Activate useful toolbars:
 - Layers, Drawing, Modifying, Properties, Styles.
- Secure tool palettes (**options** in **Tools** → **Tool Palettes**) so they remain visible.

C. Command Window

- Expand the command window (command line) to 3–4 lines to see more text.
- Press **F2** to display the full log.

1.3 Configuring AutoCAD Software

1.3.5. Important Practical Settings

A. File Management and Backup

- **Extensions:**

- Manage default locations for drawings (.DWG), templates (.DWT), blocks, fonts, etc.

- **Auto-save:**

- Enable automatic saving (Tools ⇒ Options ⇒ Open and Save) and set a short interval (e.g., 10 minutes).
- Define a temporary backup folder (.BAK, .SV\$) on a local drive.

1.3 Configuring AutoCAD Software

1.3.5. Important Practical Settings

B. Plotting and Output

- **Configure a PDF printer/virtualizer:**
 - Add a virtual printer (e.g., DWG To PDF.pc3) in Page Setup → Device Manager.
- **Define plot styles (CTB/STB)** to control colors, line widths, and patterns.

C. Line Weights

- **In Options → System → Display Preferences:**
 - Enable the display of line weights (check Show line widths).
 - Adjust the overall line width (e.g., 1–2% of the screen height).

1.3 Configuring AutoCAD Software

1.3.6. Layers and Templates

To work in a standardised manner, it is strongly recommended to create a template (.DWT).

A. Layer Structure

Create a set of standard layers. Associate an appropriate line style (colour, type, and thickness) with each layer, for example (look table in the next sheet):

B. Create a template

- Create a drawing with the desired layers, text styles, dimension styles, sheet sizes, and units.
- Save as a template: File ⇒ Save As ⇒ AutoCAD Template (*.DWT).

1.3 Configuring AutoCAD Software

1.3.6. Layers and Templates

Layer Name	Color	Linetype	Primary Use
0	White	Continuous	Default/Block creation, General outlines
MUR	Red	Continuous	Load-bearing walls (Structural)
OUV	Yellow	Continuous	Openings (Doors, Windows)
COTE	Cyan	Continuous	Dimensions (Annotations)
TEXT	Green	Continuous	Text and Labels
HACH	Magenta	Continuous	Hatching and Materials
ELEC	Blue	Dotted	Electrical symbols and wiring
PLOMB	Gray	Dashed	Plumbing and Piping

1.3 Configuring AutoCAD Software

1.3.7. Keyboard Shortcuts and Advanced Customization

Save time by customizing command aliases.

A. Customizing Shortcuts (ACAD.PGP)

- **File to modify:** ACAD.PGP (located in the AutoCAD configuration profile).

- **Example of adding common aliases:**

- After making changes, run the **REINIT** command in AutoCAD and check "PGP File" to apply the changes.

Text

L, *Line

C, *Circle

R, *Rectangle

O, *OffsetC

O, *Copy

M, *Move

RO, *Rotate

SC, *Scale

1.3 Configuring AutoCAD Software

1.3.7. Keyboard Shortcuts and Advanced Customization

B. Creating Your Own Tools

- **Use Customize (in the Tools menu) to:**
 - Create custom toolbars.
 - Add buttons for more complex commands (macros).
- **Save a user profile** (in Options ⇒ Profiles) to reuse the same configuration on other workstations.

1.3 Configuring AutoCAD Software

1.3.8. Selection and Display Behavior

A. Selection

- ***In Options ⇒ Selection:***

- Adjust the size of the selection cursor (generally 5–10% of the screen).
- Define the selection mode (window, cross, add/remove objects).

B. Precision

- ***Activate and configure:***

- ***Object snap (OSNAP, F3 in English):*** endpoint, midpoint, center, perpendicular, etc.
- ***Polar tracking*** (options in Drawing Settings) to draw at predefined angles (30°, 45°, 90°, etc.).

1.3 Configuring AutoCAD Software

1.3.9. Saving the Configuration

To avoid repeating the configuration each time:

1. In Options ⇒ Profiles:

- Create a new profile (e.g., Building – [Name] or Mechanical – [Name]).

2. Assign this profile as the default startup profile.

3. Export the profile (.ARG files) to transfer it to other machines.

1.3 Configuring AutoCAD Software

1.3.10. Final Recommendations (Adapted to the Domain)

- **Architecture / Construction:**

- Template with layers for each trade (Building, Structure, Roads & Utilities, HVAC, Electrical, etc.).
- Architectural dimensioning style (units in meters, precision to 2 decimal places).
- Custom sheet sizes (A3, A4) and print areas.

- **Mechanical Engineering / Industry:**

- Template with units in mm, precision 0.01 or 0.001 mm.
- Mechanical dimensioning styles (tolerances, symbols, adapted arrows).
- Detailed management of line types (thin, medium, bold) and line thicknesses.

1.3 Configuring AutoCAD Software

1.3.10. Final Recommendations (Adapted to the Domain)

If needed, a standard template (DWT) or a configuration file (e.g., a custom ACAD.PGP) can be attached or detailed depending on the field (civil engineering, building construction, mechanical engineering, etc.).



Thank you for your attention