

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

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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.

1.4 Reference Elements of the AutoCAD Software

Official AutoCAD resources include Autodesk's comprehensive online help, accessible directly from the software or via the website, as well as tutorials and guides for beginners and advanced users. These resources cover essential commands, product documentation, and video training. For use in French, Autodesk offers localized versions tailored to geotechnical and civil engineers..

1.4.1. Official Help and Documentation

Autodesk's online help for AutoCAD 2025 (French version) provides a guide to the fundamentals, ideal for essential 2D commands and refreshing your knowledge. Access it via help.autodesk.com or the software's Help menu for complete documentation by version. The website support.autodesk.com/fr also offers patches, updates, and an AI assistant for troubleshooting.

1.4 Reference Elements of the AutoCAD Software

1.4.2. Tutorials and Training

Official Autodesk tutorials cover annotation, dimensions, and printing via PLOT.

- **Platforms like Tuto.com** offer 12 video training courses in French, from beginner to advanced levels, including layer and scale management.
- **YouTube** hosts free tutorials such as "AutoCAD | Getting Started Training (2024)" covering the interface, units, and practical exercises.

1.4 Reference Elements of the AutoCAD Software

1.4.3. Additional Resources

Books such as "AutoCAD 2026 Instructor" or "Tutorial Guide to AutoCAD 2026" serve as comprehensive references with videos and exercises for 2D/3D. The Autodesk keyboard shortcut guide is available in PDF format for increased productivity. For engineering needs, explore the Autodesk forums and communities for specific cases.

1.5 Saving AutoCAD Files

AutoCAD primarily uses the .dwg file format for all types of documents, including parts, assemblies, and drawings, without a native distinction between these categories as in other CAD software. Automatic backup creates .bak (previous version) and .sv\$ (periodic backup) files, essential for preventing data loss during geotechnical or civil engineering work. For submission to the teacher, follow a structured procedure combining multiple recordings and checks.

1.5.1. AutoCAD File Types

AutoCAD saves drawings (parts, assemblies, or plans) in (.dwg) format by default, compatible with recent versions (2018+ for AutoCAD 2025/2026). Drawing files use the same extensions, often with multiple sheets via the Layout Manager. Enable saving in Options > Open and Save to generate (.bak) files on each save and (.sv\$) files at the defined interval (e.g., 10 minutes).

1.5 Saving AutoCAD Files

1.5.2. Standard Backup Procedure

- Press Ctrl+S or Application > Save to create/update the main .dwg file and its corresponding .bak file.
- Use Save As (Ctrl+Shift+S) to duplicate the file, choosing a name/version (e.g., "Project_Piece_v1.dwg") and a dedicated folder (OneDrive or USB for teacher sharing).
- Check Options > Open and Save: select "Create backup copy" and "Auto-save," and specify the location (e.g., C:\Users[Name]\AppData\Local\Temp).

1.5 Saving AutoCAD Files

1.5.3. Procedure for Submitting to the Instructor

- Save as a .dwg file and export to PDF (PLOT > Multi-sheet) for viewing without AutoCAD [].
- Create a zipped folder: include the main .dwg file, .bak/.sv\$ files, screenshots, and the report (e.g., "Submission_1.4_Settlement_Analysis.zip").
- Test opening the file on another PC; rename .bak/.sv\$ to .dwg if necessary for restoration [][].
- Submit via email/university portal with a clear filename (e.g., "Student_Name_Geotech_Project_Jan2026.dwg") and confirm receipt [].

1.6 Communication and Interdependence Between AutoCAD Files

AutoCAD files communicate primarily via external references (XREFs), enabling dynamic interdependence between part, assembly, and drawing files without content duplication. Any modification to a source file is automatically reflected in the target files upon reloading, which is ideal for civil engineering projects such as foundation assemblies. This approach optimizes collaboration and reduces errors during academic submissions.

1.6 Communication and Interdependence Between AutoCAD Files

1.6.1. How XREFs Work

Insert an XREF using the XREF palette (XREF command): select "Attach DWG", choose the source file (e.g., Part_Foundation.dwg), define the relative/absolute path, insertion point, scale, and rotation. The target file (e.g., Assembly.dwg) displays the content without directly modifying it; use REFEDIT to edit in place if necessary.

Types: Attachment (standard, nestable) vs. Overlay (non-nestable, to prevent loops).

1.6 Communication and Interdependence Between AutoCAD Files

1.6.2. Interdependence and Communication

- **Automatic Updates:** Modify the source → reload (RELOAD or open) to propagate the changes; AutoCAD indicates differences via clouds.
- **Layer Management:** Source layers appear prefixed (e.g., |L|Layer1); manage visibility/unloading via palettes.
- **Nested XREFs:** An assembly references a part that references another; use relative paths for portability during remittances.

1.6 Communication and Interdependence Between AutoCAD Files

1.6.3. Best Practices for Academic Projects

Structure: Part_File.dwg (isolated elements) → Assembly_File.dwg (multiple XREFs) → Drawing_File.dwg (layouts with assembly XREFs + annotations).

For teacher submission: Package all .dwg and .bak files into a single ZIP archive, test opening (check XREF Manager for valid paths), and export a multi-sheet PDF. Avoid accidental detachments; bind permanently only at the end of the project.



Thank you for your attention