

Advanced Excel with AI

Master Data Analysis, Automation & Reporting Using Microsoft Excel — from foundational skills to AI-powered workflows that transform how you work with data.

SKILL-BUILDING COURSE

EXCEL + AI

What You'll Master

This course is structured to take you from Excel fundamentals all the way to building AI-assisted automated reports. Here's the full learning journey at a glance.

01

Excel Basics

Workbooks, cells, formatting, shortcuts & formulas

02

Advanced Functions

IF, LOOKUP, INDEX-MATCH, TEXT & DATE functions

03

Data Analysis Tools

Pivot tables, conditional formatting & data validation

04

Dashboards & Reporting

Interactive dashboards, slicers & KPI tracking

05

AI in Excel

Copilot, formula generation & AI-assisted automation

06

Practical Projects

Real-world projects from salary sheets to sales dashboards



CHAPTER 1

Excel Basics

Every Excel expert started here. Before you can build powerful dashboards or automate reports, you need to be completely comfortable with Excel's core building blocks — the foundation everything else is built on.

The Core Building Blocks

Workbooks, Worksheets & Cells

A **workbook** is your Excel file. Inside, you have **worksheets** (tabs) that organize your data. Each worksheet is made up of **cells** arranged in rows and columns — this grid is where all your data lives. Mastering how to navigate and reference cells (e.g., A1, B3) is step one.

Data Entry, Formatting & Shortcuts

Efficient data entry means understanding data types: numbers, text, dates, and currency. Formatting makes your data readable — apply bold, borders, number formats, and cell colors to communicate meaning at a glance.

Key shortcuts to memorize:

- **Ctrl+C / Ctrl+V** — Copy & Paste
- **Ctrl+Z** — Undo
- **Ctrl+Shift+L** — Toggle Filters
- **F2** — Edit active cell

Basic Formulas — Your First Superpower

Formulas are what make Excel more than just a table. Every formula starts with an **=** sign. These five are the ones you'll use daily:

=SUM()

Add up a range of numbers instantly. The most-used formula in Excel.

=AVERAGE()

Calculate the mean of a dataset — great for quick performance checks.

=COUNT()

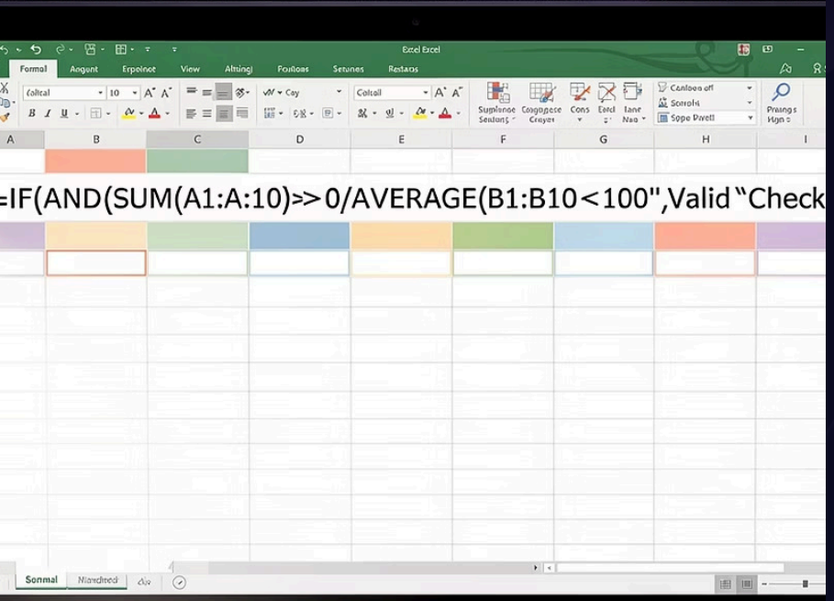
Count how many cells contain numbers in a range.

=MAX() / =MIN()

Find the highest or lowest value in a dataset with ease.

=IF()

Apply logic: if a condition is true, return one value — otherwise, another.





CHAPTER 2

Advanced Excel Functions

Once you know the basics, advanced functions unlock a whole new level of analytical power. These are the formulas that separate casual Excel users from true data professionals.

Logical & Conditional Functions

IF & IFS — Decision Logic

The **IF function** tests a condition and returns different values based on true/false. **IFS** extends this to handle multiple conditions cleanly — no more deeply nested IFs.

Example: =IFS(Score>=90,"A", Score>=80,"B", Score>=70,"C", TRUE,"F")

SUMIF, COUNTIF & AVERAGEIF

These conditional aggregation functions let you calculate totals, counts, or averages based on specific criteria — essential for any reporting task.

- **SUMIF** — Sum only values meeting a condition
- **COUNTIF** — Count cells matching criteria
- **AVERAGEIF** — Average values for a specific group

Lookup Functions — Find Data Fast

Lookup functions are the backbone of data integration in Excel. They allow you to pull related information from different tables automatically — no manual searching required.

VLOOKUP & HLOOKUP

Search vertically or horizontally for a value and return data from the same row or column. Classic, widely used — but has limitations with leftward lookups.

XLOOKUP

The modern replacement for VLOOKUP. More flexible: works in any direction, handles errors gracefully, and supports exact or approximate matches. Use this whenever possible.

INDEX-MATCH

A powerful combination that gives you full flexibility to look up values in any direction. INDEX returns a value at a position; MATCH finds that position. Together, they outperform VLOOKUP in complex scenarios.

Text & Date Functions

Text Manipulation

Clean, extract, and transform text data programmatically:

- **LEFT(text, n)** — Extract n characters from the left
- **RIGHT(text, n)** — Extract n characters from the right
- **MID(text, start, n)** — Extract characters from the middle
- **TEXT(value, format)** — Format numbers as text (e.g., dates, currency)
- **TRIM / PROPER / UPPER / LOWER** — Clean and normalize text

Date & Time Functions

Work with dates intelligently to power reports and trackers:

- **TODAY() / NOW()** — Dynamic current date or timestamp
- **DATE(year, month, day)** — Construct a date from parts
- **DATEDIF()** — Calculate intervals between two dates
- **YEAR(), MONTH(), DAY()** — Extract date components
- **NETWORKDAYS()** — Count working days between dates



CHAPTER 3

Data Analysis Tools

Excel's built-in data analysis tools let you explore, clean, and summarize large datasets — turning raw numbers into clear, actionable insights without writing a single line of code.

Organize & Clean Your Data



Sort & Filter

Sort data by one or more columns (A→Z, largest→smallest). Use filters to display only the rows that meet specific criteria — essential for exploring large datasets quickly.



Conditional Formatting

Automatically color-code cells based on their values. Highlight top performers, flag overdue dates, or create heat maps — visual cues that make patterns jump off the page.



Data Validation

Restrict what users can enter into a cell — dropdown lists, number ranges, or date constraints. Prevents errors at the source and keeps your data clean and consistent.



Remove Duplicates & Flash Fill

Remove Duplicates cleans repeated records instantly. **Flash Fill** is Excel's smart auto-complete — it detects patterns in your data entry and fills the rest automatically.

Pivot Tables & Pivot Charts

Why Pivot Tables Are a Game-Changer

A **Pivot Table** lets you summarize thousands of rows of data into a compact, interactive summary — in seconds, with no formulas required. Drag and drop fields to group, filter, and aggregate data from any angle.

You can calculate sums, averages, counts, percentages, and more — and instantly pivot (rotate) your view to look at the data differently.

Pivot Charts

Once your Pivot Table is set up, a **Pivot Chart** visualizes that same data dynamically. As you change your Pivot Table filters, the chart updates automatically.

Best practices:

- Start with clean, structured data (one header row)
- Use slicers to make pivot tables interactive
- Group dates by month or quarter for trend analysis
- Use "Show Values As" for percentage breakdowns

CHAPTER 4

Dashboards & Reporting

An Excel dashboard is a single-screen view that consolidates your most important data into charts, KPIs, and interactive controls. When done right, it replaces hours of manual reporting with a living, breathing data tool.



Building Interactive Dashboards

1

Design Your Layout

Plan which KPIs, charts, and summaries matter most. Use a dedicated sheet for your dashboard and separate sheets for raw data.

2

Build Your Charts

Create bar, line, pie, and combo charts linked to your data. Format them consistently — same font, color palette, and style across all visuals.

3

Add Slicers & Timelines

Connect slicers and timeline filters to your pivot charts so users can filter the entire dashboard by region, product, date range, or any dimension.

4

Add KPI Indicators

Use conditional formatting, formulas, and symbols (▲▼●) to show whether each metric is on track, at risk, or behind target at a glance.

Charts, Slicers & Timeline Filters

Choosing the Right Chart

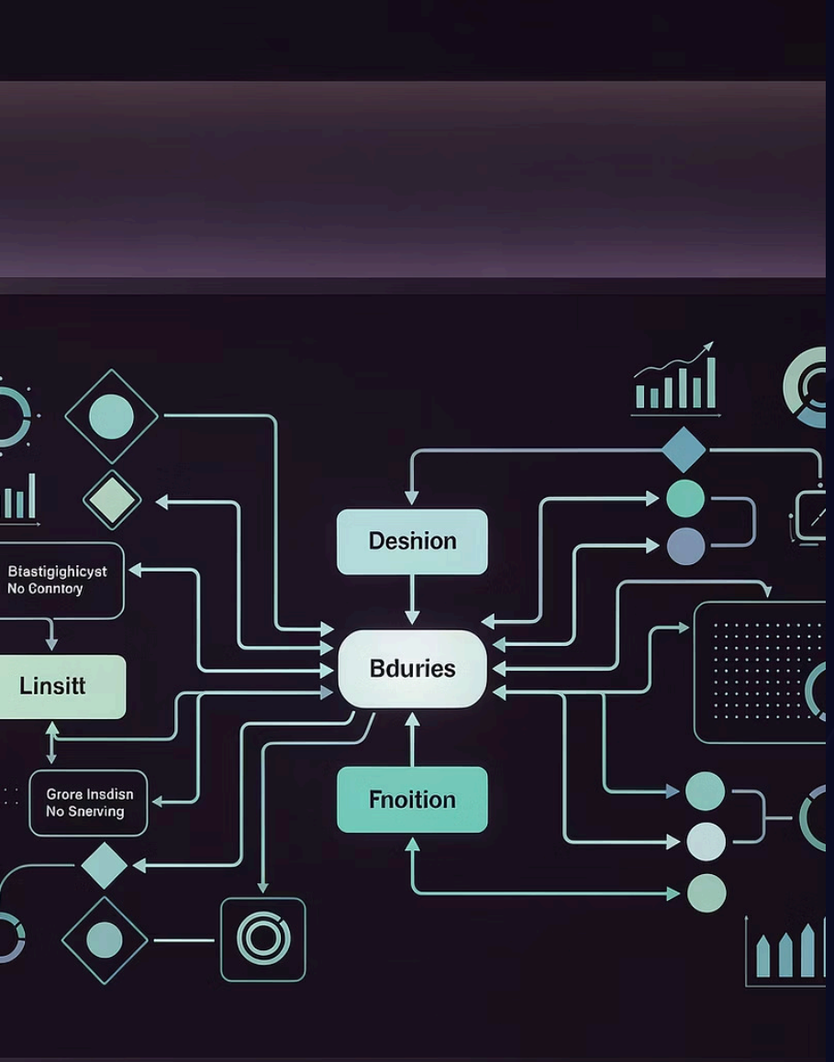
The right chart type makes data instantly understandable:

- **Column/Bar** — Compare categories
- **Line** — Show trends over time
- **Pie/Donut** — Show proportions of a whole
- **Combo** — Overlay two data series with different scales
- **Scatter** — Reveal correlations between variables

Slicers & Timeline Filters

Slicers are visual buttons that filter your Pivot Tables and charts with one click — perfect for dashboard interactivity. Add them via *Insert → Slicer*.

Timeline Filters are date-specific slicers that let users drag to select any date range — by year, quarter, month, or day. They make time-series analysis intuitive and fast.



CHAPTER 5

Advanced Features

Excel's advanced analytical tools let you model uncertainty, run simulations, and transform raw data at scale — capabilities that bring a professional-grade analytical edge to your work.

What-If Analysis Tools

What-if analysis lets you explore how changes in inputs affect your outputs — critical for financial modeling, planning, and decision-making.

Goal Seek

Work backwards: set a target output value and let Excel calculate the input required to achieve it. Example: "What sales volume do I need to hit $500K revenue?"

Scenario Manager

Define and save multiple input scenarios (Best Case, Worst Case, Base Case) and switch between them instantly. Ideal for presentations and stakeholder discussions.

Data Tables

Automatically calculate results across a range of input values in a single table. One-variable tables test one input; two-variable tables test two simultaneously — great for sensitivity analysis.

Power Query & Power Pivot

Power Query — Data Transformation Engine

Power Query (Get & Transform) lets you connect to external data sources — CSV, databases, web, APIs — and clean, reshape, and transform that data automatically. Your transformation steps are recorded and can be refreshed with one click every time new data arrives.

Use it to merge tables, unpivot columns, split text, remove errors, and normalize inconsistent data — all without touching your raw data.

Power Pivot — In-Memory Data Modeling

Power Pivot extends Excel's capabilities by allowing you to work with **millions of rows** across multiple related tables. It uses the **DAX formula language** to create sophisticated calculated columns and measures.

Key benefits:

- Handle data too large for regular Excel
- Build relationships between multiple tables
- Create KPIs and time-intelligence calculations

CHAPTER 6

AI in Excel

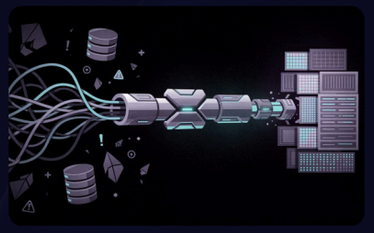
Artificial Intelligence is fundamentally changing how we work with Excel. With tools like Microsoft Copilot built directly into Excel, tasks that used to take hours can now be accomplished in seconds — just by describing what you want.



Microsoft Copilot in Excel

Copilot is Microsoft's AI assistant embedded directly in Excel 365. It understands natural language — you describe what you want, and it does the work.







AI Formula Generation

Describe what you need in plain English — "Calculate the month-over-month growth rate" — and Copilot writes the formula for you. It also explains formulas you paste in, so you understand what you're working with.

AI for Data Cleaning

Ask Copilot to identify inconsistencies, fill missing values, standardize formats, and flag anomalies. What used to take an hour of manual review happens in moments.

AI for Insights & Summaries

Copilot analyzes your data and surfaces trends, outliers, and patterns — with natural-language explanations. It can generate executive summaries and highlight what matters most.

AI-Assisted Report Creation & Prompt Strategies

AI-Assisted Report Automation

Instead of manually building reports every week, use AI to generate structured summaries directly from your data. Copilot can draft narrative insights, auto-format tables, and suggest the right visualizations — turning your data into a polished report with minimal effort.

Combine AI with Power Query refresh cycles to create **fully automated weekly reporting pipelines**.

Smart AI Prompts for Productivity

The quality of your AI output depends on the quality of your prompt. Use these proven patterns:

- **"Analyze this table and highlight the top 3 trends"**
- **"Write a formula to calculate rolling 3-month average"**
- **"Clean this column — remove leading spaces and standardize capitalization"**
- **"Summarize this data for an executive audience in 3 bullet points"**

CHAPTER 7

Practical Projects

Theory only takes you so far. These hands-on projects are designed to apply everything you've learned — from basic formulas to AI-powered automation — in real-world professional scenarios.



Project 1 & 2: Salary & Attendance Sheets

💼 Salary Sheet

Build a professional payroll calculator that computes gross pay, deductions, taxes, and net salary for each employee. You'll apply:

- IF and IFS for tax bracket logic
- SUMIF to calculate department totals
- TEXT functions to format currency and dates
- Conditional formatting to flag anomalies
- AI to generate payroll summary reports

📋 Attendance Sheet

Create a dynamic monthly attendance tracker with automated calculations for present days, absences, late arrivals, and leave balances. You'll apply:

- COUNTIF to tally attendance statuses
- NETWORKDAYS for working day calculations
- Data validation for dropdown status entry
- Conditional formatting for visual status coding
- AI to flag attendance patterns and outliers

Project 3: Sales Dashboard

This is the capstone data visualization project — a fully interactive sales performance dashboard that a real business could use.

1

Import & Clean Sales Data

Use Power Query to connect to your sales data source, remove duplicates, standardize product names, and load clean data into Excel.

2

Build Pivot Tables

Summarize sales by region, product, salesperson, and time period. Create calculated fields for margin, growth rate, and target achievement.

3

Design Visualizations

Add bar charts for regional performance, line charts for monthly trends, and a donut chart for product mix — all formatted consistently.

4

Add Interactivity

Connect slicers for Region, Product Category, and Salesperson. Add a Timeline filter for date range selection.

5

AI Insights Layer

Use Copilot to generate a written executive summary of key findings, automatically updated when data refreshes.

Project 4 & 5: Expense Tracker & AI Report Automation

💰 Expense Tracker

Build a personal or business expense tracking workbook that categorizes spending, tracks budgets vs. actuals, and visualizes where money is going. Features include:

- Dropdown categories via data validation
- SUMIF-based budget vs. actual comparison
- Monthly trend line chart
- Conditional formatting to flag over-budget items
- AI-generated monthly spend summary

🤖 AI-Based Report Automation

The final project ties everything together. You'll build a system where:

- Power Query auto-refreshes data from a source file
- Pivot tables and charts update automatically
- Copilot generates a written narrative summary
- The final report is ready to share — with zero manual work

This is the workflow that will save you hours every single week.



You're Ready to Excel — With AI

From mastering your first SUM formula to building AI-powered automated report pipelines, you now have a complete roadmap to becoming an advanced Excel professional. The skills in this course are immediately applicable — start with one project, build your confidence, and keep leveling up.

🎯 Apply It Today

Pick one project and start building. Real skill comes from doing, not just watching.

🤖 Embrace AI Tools

Use Copilot and AI prompts daily — the faster you integrate them, the greater your productivity advantage.

📈 Keep Iterating

Every dashboard and report you build makes you better. Share your work, get feedback, and refine your craft.