



Mathematics for Machine Learning with Python

Course ID #: 7000-1206-ZZ-Z

Hours: 21

Delivery Method: Group Internet Based

Course Content

Description:

This ML with Python course provides a comprehensive foundation in the mathematical and computational principles that underpin modern machine learning. Learners will develop a strong understanding of linear algebra, calculus, probability, and statistics, and apply these concepts using Python to solve real-world problems. Through a combination of theoretical instruction, hands-on Python exercises, and practical case studies, the course bridges mathematical intuition with applied machine learning techniques. By the end of the course, learners will be able to understand, implement, and evaluate machine learning models with confidence.

Objectives:

Upon successful completion of this course, students will:

- Apply core linear algebra concepts such as vectors, matrices, and decompositions in machine learning contexts
- Use calculus concepts including derivatives and gradient descent to support model optimization
- Explain and apply probability concepts, distributions, and Bayesian inference
- Perform statistical analysis using descriptive and inferential methods and hypothesis testing
- Use Python, NumPy, Pandas, and Matplotlib for mathematical computing and data analysis
- Implement supervised and unsupervised machine learning techniques
- Evaluate and select models using appropriate performance metrics and real-world case studies

Prerequisites:

- Basic Python programming experience
- Fundamental algebra skills
- Basic statistics knowledge
- Experience working with data
- General technical background

Target Audience:

- Software developers
- IT architects
- Technical and product managers
- Designers
- Data analysts
- Data engineers



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Topics:

Linear Algebra

- Vectors and Matrices
- Eigenvalues and Eigenvectors
- Matrix Decompositions

Calculus

- Derivatives and Integrals
- Differential Equations
- Gradient Descent

Probability

- Basic Probability Concepts
- Discrete and Continuous Probability Distributions
- Bayesian Inference

Statistics

- Descriptive Statistics
- Inferential Statistics
- Hypothesis Testing

Python for Mathematics

- Python Basics
- NumPy and Pandas for Data Manipulation
- Matplotlib for Visualization

Machine Learning Techniques

- Supervised Learning
- Unsupervised Learning
- Model Evaluation and Selection

Case Studies and Applications

- Real-World Machine Learning Projects
- Application of Mathematical Concepts
- Hands-On Python Exercises



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Microsoft Copilot BYOL

Bring Your Own License (BYOL):

To have this class be the most effective for its students, they must have purchased a Microsoft CoPilot License. They *MUST* check that they have this license more than 24 hours* before the class starts.

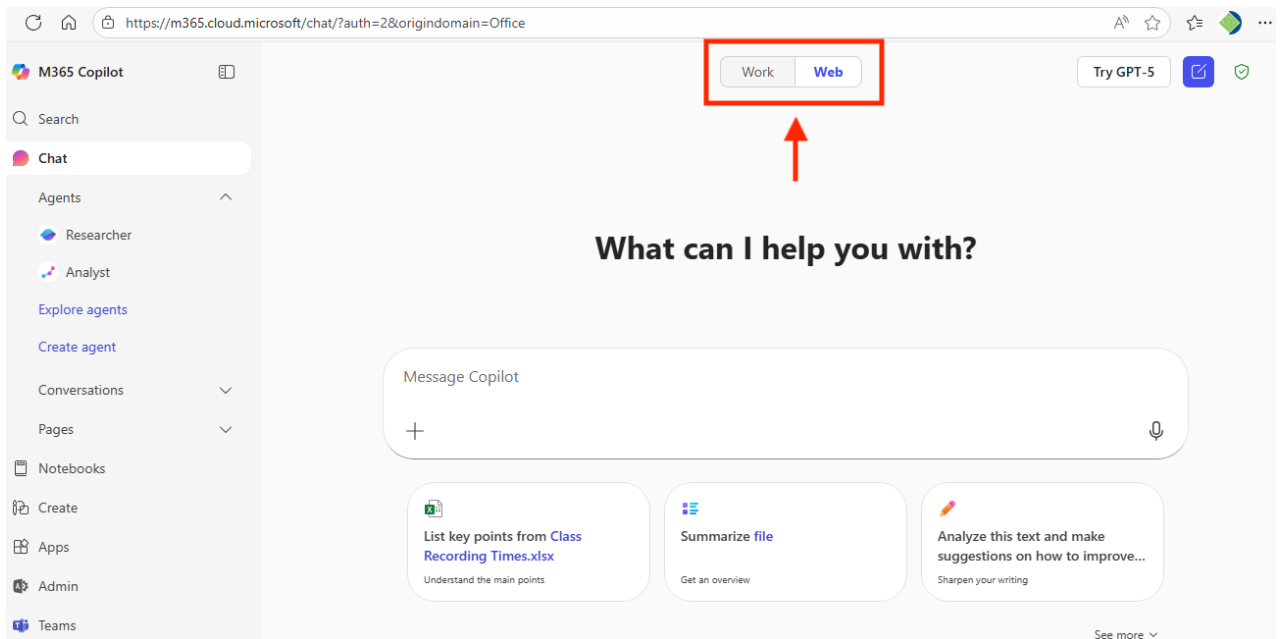
How to Check if you have a Copilot license:

Online

1. Navigate to your M365 Copilot chat (<https://m365.cloud.microsoft/chat>)

If you have the options “**Work** | **Web**” you have a license.

If you do not see these options, you only have the free version of Copilot.



Desktop App

1. Open a MS Office application on your desktop.
2. Look for the Copilot icon/button on the Home tab of the top ribbon.

Examples of what it could look like:

- A sparkle or star icon ✨
- A label like “Copilot”, “Ask Copilot”, or “Draft with Copilot”



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Additional Information:

*After purchasing a license, it may take up to 24 hours to activate. Some users may have an organizational license, but their administration or tech team may have it only available for certain users.

When activated, Copilot usually opens in a sidebar on the right side of the application window, where you can:

- Ask questions
- Generate or rewrite text
- Summarize documents
- Get formatting help

In some versions, Copilot may also appear as a floating suggestion box when you highlight text or start typing, offering to help rewrite, summarize, or expand content.

If you cannot find the icon/button, you can also try typing “Copilot” into the “Tell me what you want to do” search bar at the top of the office application to locate it quickly.

Register for this class by visiting us at:

www.tcworkshop.com or by calling us at 800-639-3535

NASBA CPE details are provided on the following pages.



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NASBA Information

Level: Intermediate

Advanced Preparation:

Attendance Requirement: To be awarded the full credit hours, you must sign in and attend the entire course.

Recommended Field(s) of Study: Computer Software and Applications

Recommended CPEs: 23.40

Policies: Course Registration, Cancellation, Refund, and Complaint Resolution

For more information regarding administrative policies such as complaint and program cancellation policies, please contact our offices at 800-639-3535 or visit us at: www.tcworkshop.com

Official National Registry Statement:

The Computer Workshop is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credits. Complaints regarding registered sponsors may be submitted to the National Registry of CPE Sponsors through its website: www.nasbaregistry.org

NOTE: Since our information is in multiple places on our website or in PDF format that is sent to clients, we have provided our normal course content with the NASBA Information added along with links to our policy page on the web. We will add our name to the Official National Registry Statement after we are approved.