

# AI/ML for Climate Workshop

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International Livestock Research Institute (ILRI)

## Prerequisites

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### System Requirements

#### Software Requirements

- **Python 3.8 or higher**
- **Git** for version control
- **Text editor** or IDE (VS Code, PyCharm, Jupyter Lab recommended)
- **Web browser** (Chrome, Firefox, Safari, Edge)

#### Python Packages

The following packages will be installed during the setup: - `numpy` - Numerical computing - `pandas` - Data manipulation and analysis - `xarray` - Multi-dimensional labeled arrays - `matplotlib` - Plotting and visualization - `cartopy` - Cartographic projections and geospatial data processing - `netcdf4` - NetCDF file handling - `scipy` - Scientific computing - `scikit-learn` - Machine learning library - `jupyter` - Interactive notebooks

## Knowledge Prerequisites

### Basic Programming

- **No prior Python experience required** - we'll start from the basics
- Basic understanding of programming concepts is helpful but not mandatory
- Familiarity with command line/terminal is beneficial

### Climate Science Background

- Basic understanding of meteorology and climate science
- Familiarity with weather data and forecasting concepts

- Experience working with meteorological datasets is advantageous

## Mathematical Foundation

- Basic statistics and probability
- Understanding of linear algebra concepts (helpful for ML sections)
- Familiarity with time series analysis (beneficial but not required)

## Hardware Requirements

### Minimum Specifications

- **RAM:** 4GB minimum, 8GB recommended
- **Storage:** 2GB free space for software and datasets
- **Processor:** Any modern CPU (Intel i3/AMD equivalent or better)
- **Internet:** Stable connection for downloading datasets and collaboration

### Recommended Specifications

- **RAM:** 8GB or more
- **Storage:** 5GB+ free space
- **Processor:** Intel i5/AMD Ryzen 5 or better
- **Internet:** High-speed connection for real-time collaboration

## Pre-Training Preparation

### 1. Software Installation

Please complete the [Setup Guide](#) before the training begins.

### 2. Test Your Environment

- Verify Python installation
- Test Jupyter notebook functionality
- Ensure internet connectivity for data downloads

### 3. Familiarize Yourself

- Review the [training schedule](#)
- Join the [collaboration platform](#)
- Read through the [Code of Conduct](#)

# Optional Preparation

## Recommended Reading

- **Python for Climate Science:** Basic Python tutorials
- **Xarray Documentation:** [xarray.pydata.org](https://xarray.pydata.org)
- **Climate Data Analysis:** Introduction to NetCDF format

## Online Resources

- [Python.org Beginner's Guide](https://python.org)
- [Jupyter Notebook Tutorial](https://jupyter.org)
- [Climate Data Store](https://climate-data-store.org)


## Support

If you encounter any issues with the prerequisites or setup: -  **Email:**

[yonas.mersha14@gmail.com](mailto:yonas.mersha14@gmail.com) -  **Collaboration Platform:** [Join the discussion](#) - 

**Documentation:** Check the [Setup Guide](#) for detailed instructions

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**Ready to begin?** Once you've completed these prerequisites, you'll be fully prepared for our Python and AI/ML climate training program! 

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