**1. Introduction to NumPy**

* What is NumPy?
* Why use NumPy instead of lists?
* Installing NumPy (pip install numpy)
* Importing NumPy (import numpy as np)

**2. NumPy Arrays**

* Creating NumPy arrays
* np.array() vs Python lists
* Checking array type (dtype)
* Array shape and size (.shape, .size)
* Reshaping arrays (.reshape())

**3. Array Indexing & Slicing**

* Indexing 1D, 2D, and 3D arrays
* Slicing arrays (arr[start:stop:step])
* Boolean indexing
* Fancy indexing

**4. NumPy Functions & Operations**

* Basic operations (+, -, \*, /)
* Universal functions (np.sum(), np.mean(), np.max(), etc.)
* Aggregation functions (np.min(), np.std(), np.median())

**5. NumPy Broadcasting**

* What is broadcasting?
* Broadcasting rules
* Practical examples

**6. Working with Special Arrays**

* Creating zero arrays (np.zeros())
* Creating ones arrays (np.ones())
* Creating identity matrix (np.eye())
* Creating random arrays (np.random.rand(), np.random.randint())

**7. Linear Algebra with NumPy**

* Matrix multiplication (np.dot(), @)
* Transpose of a matrix (.T)
* Inverse of a matrix (np.linalg.inv())
* Determinant (np.linalg.det())

**8. NumPy Advanced Topics**

* Stacking arrays (np.vstack(), np.hstack())
* Splitting arrays (np.split())
* Sorting and searching (np.sort(), np.argsort())
* Unique values (np.unique())

**9. Reading & Writing Data**

* Loading data from text/CSV (np.loadtxt(), np.genfromtxt())
* Saving arrays (np.save(), np.savetxt())

**10. NumPy Performance Optimization**

* Vectorization
* Avoiding loops with NumPy
* Measuring performance with %timeit