# Backend Basics – C and C++ (Industry Standard Curriculum)

**1. Introduction to Backend Development**
✔ What is Backend?
✔ Role of Backend Developers
✔ How C & C++ are used in Backend
✔ Compilers, Interpreters, Linkers

**2. C Programming – Backend Foundations**
✔ Introduction to C
✔ Structure of a C Program
✔ Variables, Datatypes, Operators
✔ Conditions & Loops
✔ Functions & Modular Programming
✔ Arrays, Strings
✔ Pointers & Memory Management
✔ Structures & Unions
✔ File Handling in C (Reading/Writing Files)
✔ Working with System Calls
✔ Building Console-Based Backend Logic

**3. Advanced C for Backend**
✔ Dynamic Memory (malloc, calloc)
✔ Linked Lists, Stacks, Queues
✔ Sorting & Searching Algorithms
✔ Error Handling
✔ Creating Libraries in C
✔ Understanding Process Management

**4. C++ Programming – Object-Oriented Backend**
✔ Introduction to C++
✔ Variables, Datatypes, Operators
✔ OOP Concepts (Class, Object, Inheritance, Polymorphism)
✔ Constructors & Destructors
✔ Operator Overloading
✔ Templates (Function & Class Templates)
✔ Exception Handling
✔ Namespaces
✔ C++ Standard Template Library (STL)
✔ File Handling in C++

**5. Advanced C++ for Backend Systems**
✔ Data Structures Implementation (List, Stack, Queue, Map)
✔ Memory Management (new, delete, smart pointers)
✔ Multithreading Basics (threads, mutex)
✔ Networking Concepts (Basic Sockets Introduction)
✔ Creating Reusable Backend Modules

**6. Backend Architecture Basics**
✔ Server & Client Architecture
✔ API Basics
✔ Request & Response Flow

✔ How Low-Level Languages Power High-Performance Backends

**7. Industry Use Cases**
✔ Game Servers
✔ Banking & Finance Systems
✔ High-Performance Applications
✔ System-Level Tools
✔ Embedded Software Backends

**8. Final Backend Project**
✔ Build a Mini File Storage System (C)
✔ Build a Data Processing Engine (C++)
✔ Implement Logging & Error Handling
✔ Performance Optimization

**Extras**
✔ Git & GitHub Basics
✔ Debugging Techniques
✔ Best Coding Standards for C & C++
✔ Interview Questions & Practice Tasks