C++ LANGUAGE SYLLABUS COPY

Engineered for skill enhancement.

PROGRAM HIGHLIGHTS

Accredited Certificates:
✓ Program approved ISO Certification
Internships:
✓ **Industry-relevant opportunities provided**
Placement Assistance:
✓ Career guidance from industry experts
Basic to Advanced Level Training:
✓ Learn from experienced C++ professionals
Live & Recorded Lectures:
✓ Flexible learning at your convenience
Real-Time Projects:
✓ Hands-on minor & major projects

ABOUT US

- **OUR MISSION :**

NxtSync is a pioneering EdTech company committed to bridging the gap between theoretical learning and practical application. Our mission is to empower students with cutting-edge C++ programming skills that enhance employability and prepare them for the technology-driven future.

- **OUR VISION--UPSKILL**: Empowering minds for the future.
- **INNOVATE**: Fostering creativity and breakthroughs .
- **EXCEL**: Preparing industry-ready professionals.

WHY IOT & ROBOTICS?

- Widely used in system/software development, game development, and applications requiring high-performance graphics.
- C++ is a robust, flexible language that supports Object-Oriented Programming (OOP) principles.
- High demand for C++ developers in industries such as gaming, finance, robotics, and embedded systems.
- C++ is a powerful language used for developing resource-constrained applications and system software.
- Careers in software engineering, game development, cybersecurity, and data analytics.

LEARNING PATH

- Introduction to C++ Programming
- Data Types & Variables
- Control Structures (Loops, Conditionals)
- Functions & Recursion
- Object-Oriented Programming (OOP) in C++
- Memory Management in C++
- Advanced C++ Features (STL, Templates, Lambda Functions)
- File Handling & Exception Handling
- Multi-threading & Parallel Programming

DETAILED MODULE BREAKDOWN

Module 1: Introduction to C++ Programming

- Basics of C++
- Compiling & Executing C++ Programs
- Introduction to IDEs & Debugging
- Writing Your First Program

Module 2: Data Types & Variables

- Primitive Data Types (int, float, char, etc.)
- User-defined Data Types (struct, enum)
- Variables, Constants, and Type Casting
- Arrays & Strings

Module 3: Control Structures (Loops, Conditionals)

- Conditional Statements (if, switch)
- Loops (for, while, do-while)
- Nested Loops & Conditionals
- Break & Continue Statements

Module 4: Functions & Recursion

- Defining & Calling Functions
- Function Overloading & Default Arguments
- Recursion Techniques
- Scope & Lifetime of Variables

Module 5: Object-Oriented Programming (OOP) in C++

- Classes & Objects
- Encapsulation & Data Abstraction
- Inheritance & Polymorphism
- Virtual Functions & Abstract Classes

Module 6: Memory Management in C++

- Pointers & References
- Dynamic Memory Allocation (new, delete)
- Memory Leaks & Garbage Collection
- Smart Pointers & RAII

Module 7: Advanced C++ Features (STL, Templates, Lambda Functions)

- Introduction to Standard Template Library (STL)
- Vectors, Maps, Sets, Queues, and Iterators
- Function Templates & Class Templates
- Lambda Expressions

Module 8: File Handling & Exception Handling

- File Input/Output (ifstream, ofstream)
- Binary vs Text Files
- Exception Handling with try, catch, throw
- Custom Exception Classes

Module 9: Multi-threading & Parallel Programming

- Introduction to Threads & Concurrency
- Creating & Managing Threads
- Synchronization Techniques (mutex, condition variables)
- Parallel Algorithms

Module 10: Capstone Projects & Industry Research

- Hands-on Real-Time C++ Projects
- Industry Collaboration & Research-Based Projects
- C++ Portfolio Building
- Algorithm Development & Optimization Techniques

ASSIGNMENT'S &ASSESSMENTS

- Weekly hands-on assignments
- Mid-term C++ mini-projects
- Final capstone C++ project
- Live presentations & discussions

TOOLS & FRAMEWORKS USED

- **C++ IDEs & Compilers:**
  Visual Studio, Code::Blocks, CLion, GCC (GNU Compiler Collection)
- **Version Control & Collaboration:**
  Git, GitHub, GitLab
- **Debugging & Profiling Tools:**
  GDB, Valgrind, AddressSanitizer
- **Libraries & Frameworks:**
  STL (Standard Template Library), Boost C++ Libraries, OpenGL (for graphics), Pthreads (for multi-threading)

RECOMMENDED READING

Digital Marketing:

- **"C++ Primer"** by Stanley B. Lippman
- **"Effective C++"** by Scott Meyers
- **"The C++ Programming Language"** by Bjarne Stroustrup
- **"Accelerated C++"** by Andrew Koenig
- **"The Art of Computer Programming"** by Donald E. Knuth

WHY CHOOSE NXTSYNC?

- Industry-Aligned C++ Programming Curriculum
- Hands-on Real-World Projects
- Expert Mentorship & Career Guidance
- Flexible Learning Schedule
- ISO-Certified C++ Training Program

Start Your C++ Language Journey with NxtSync Today!

THANK YOU