Session plan for Introduction to C++ (2 hours each)

1. Install a Build environment for C++ and revision of basic concepts
   - Install MSYS2 UCRT64 with VS Code
   - Create a build environment
   - Mental model of C++
   - Core C++ foundations
2. C++ syntax continued, refs and const
   - Literals and operators
   - uniform init
   - auto/decltype
   - enum class
   - nullptr
   - lvalue and rvalue
   - const refs vs by-value
3. Control flow, Strings and vectors, headers and sources
   - if, switch, for, while
   - range-for idiom
   - std::string, std::vector
   - headers and sources
4. Classes part 1
   - class vs struct
   - access control
   - member functions
5. Classes part 2
   - Destructor, copy ctor/assignment
   - lab exercises
6. Move semantics
   - Value categories
   - move ctor/assign
   - std::move
   - swap idiom
7. RAII and Smart pointers
   - concept of RAII
   - focus on std::unique_ptr
   - basic or strong exception-safety
8. STL containers part 1
   - array, vector, string, deque, list
   - iterator basics
   - iteration patterns
9. STL containers part 2
   - map and set
   - multimap and multiset
   - unordered map and unordered set

10. Algorithms part 1
    - find, count
    - copy, remove
    - sort, stable_sort
    - accumulate
    - comparators
11. Algorithms part 2
    - Categories of iterators
12. Streams and file I/O
    - iostream
    - state bits and exceptions
    - ifstream, ofstream, fstream
13. Error handling
    - try, catch, throw
    - standard exceptions
    - noexcept
    - exception safety levels
    - assert
14. Templates part 1
    - Function and class templates
    - type and non-type params
    - deduction
    - alias templates
15. Testing and debugging
    - Build modes and flags
    - Run gdb from VS Code
    - use of breakpoints, step, watch
    - simple logging
16. Standard utilities
    - <chrono>
    - <random>
    - <regex>