

Student Laptop Setup Book

Beginner C++ Course Level 1 Windows Setup

This booklet helps students prepare a Windows laptop for the first lessons in C++. By the end, each student should be able to create a folder, write a small C++ program, compile it, run it, and fix the most common setup problems.

Recommended Free Setup

Tool	Why We Use It
Visual Studio Code	A simple editor that works well for beginners and advanced students.
MSYS2 with MinGW-w64 GCC	A free C++ compiler for Windows.
C/C++ extension for VS Code	Adds C++ highlighting and helpful editor support.

Before You Start

- Use a Windows laptop where you are allowed to install programs.
- Connect to a reliable internet connection.
- Have at least 30 minutes for setup.
- Create a simple course folder such as C:\CppCourse.

Part 1 Install Visual Studio Code

1. Go to <https://code.visualstudio.com>.
2. Download Visual Studio Code for Windows.
3. Open the installer.
4. Keep the default settings. If you see an option named Add to PATH, leave it checked.
5. Finish the installation and open Visual Studio Code.

[Screenshot placeholder: VS Code download page]

[Screenshot placeholder: VS Code welcome screen]

Part 2 Install the C plus plus Extension

6. In VS Code, click the Extensions button on the left side.
7. Search for C/C++.
8. Install the extension published by Microsoft.
9. Close the Extensions tab when it finishes.

[Screenshot placeholder: C/C++ extension search result]

Part 3 Install MSYS2 and the Compiler

10. Go to <https://www.msys2.org>.
11. Download the installer for Windows.
12. Run the installer and use the default folder C:\msys64.
13. When MSYS2 opens, run the update command shown on the MSYS2 website if prompted.
14. Open MSYS2 UCRT64 from the Start menu.
15. Install the C++ compiler by typing this command and pressing Enter:

```
pacman -S --needed mingw-w64-ucrt-x86_64-gcc
```

When asked to continue, type Y and press Enter.

[Screenshot placeholder: MSYS2 UCRT64 window after compiler install]

Part 4 Add the Compiler to Windows PATH

16. Open the Start menu and search for environment variables.
17. Choose Edit the system environment variables.
18. Click Environment Variables.
19. Under User variables, select Path and click Edit.
20. Click New and add C:\msys64\ucrt64\bin.
21. Click OK on all windows.
22. Close and reopen VS Code so it can see the new PATH.

[Screenshot placeholder: PATH entry with C:\msys64\ucrt64\bin]

Part 5 Check That the Compiler Works

23. Open VS Code.
24. Open the Terminal menu and choose New Terminal.
25. Type the command below and press Enter.

```
g++ --version
```

If setup worked, you should see version information for g++.

Part 6 Create Your First Project

26. Create a folder named C:\CppCourse.
27. Inside it, create a folder named Lesson01_HelloWorld.
28. In VS Code, choose File, then Open Folder.
29. Open C:\CppCourse\Lesson01_HelloWorld.
30. Create a new file named main.cpp.

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {  
    cout << "Hello, world!" << endl;  
    return 0;  
}
```

Part 7 Compile and Run

31. Save the file.
32. Open the VS Code terminal.
33. Compile the program:

```
g++ main.cpp -o hello.exe
```

34. Run the program:

```
.\hello.exe
```

Expected output:

```
Hello, world!
```

File and Folder Naming Rules

- Use simple names with letters, numbers, and underscores.
- Avoid spaces in file and folder names while learning.
- Use .cpp for C++ source files.
- Name the main file main.cpp unless your teacher says otherwise.
- Keep each lesson in its own folder.

Good Names	Avoid for Now
Lesson01_HelloWorld	Lesson 1 Hello World
main.cpp	main
robot_score.cpp	robot score final!!.cpp

Troubleshooting

Problem	What To Try
g++ is not recognized	Close and reopen VS Code. Check that C:\msys64\ucrt64\bin is in PATH.
No output appears	Make sure you ran .\hello.exe after compiling.
The file compiles but old text prints	Save main.cpp, compile again, then run again.
Missing semicolon error	Check the end of each statement, especially cout and return lines.
Cannot find main.cpp	Use cd to move into the project folder, or open the correct folder in VS Code.

Setup Completion Check

- ☐ I installed VS Code.
- ☐ I installed the C/C++ extension.
- ☐ I installed MSYS2 and g++.
- ☐ I can run `g++ --version`.
- ☐ I created `main.cpp`.
- ☐ I compiled and ran Hello, world.