

## CS 271 Visual Studio Setup Instructions

The following consists of installation & setup tutorials for Visual Studio 2019. If you prefer to configure Visual Studio 2017, that version can also be used in this class.

**\*Note: Although the latest Visual Studio 2022 is available, we will be using Visual Studio 2019 (or 2017) for this class**

**If you want to use Visual Studio via Citrix, please see the bottom of this page.**

Coming out of this module you should have done the following:

- Set up Microsoft Visual Studio
- Install and configure Kip Irvine's libraries
- Started a new Assembly code project
- Verified that Visual Studio is installed properly

Please also note that your Visual Studio install will need to be "Activated" with your Product Key. You can retrieve this key at any time through the [Microsoft Azure interface](#) by looking in "All Services --> Other --> Education --> Software" and clicking on the Visual Studio product.

### Installation on PC

**Part 0: For Linux or Mac Users Only (Windows Users may skip this part):**

#### **Setting Up a Virtual Machine**

##### **Option 1 (Virtual Box):**

This video will show you how to set up a virtual machine running Windows if you are using Linux or Mac. Doing this will allow you to run Visual Studio and MASM inside of your virtual machine.

[https://www.youtube.com/embed/JWmGpMM-P\\_c](https://www.youtube.com/embed/JWmGpMM-P_c)

##### **Option 2 (VMware):**

OSU students get free access to virtualization products including VMware Fusion (for Mac OS) and VMware Workstation (for Linux). Both of those tools are available for download at the [VMware Academic Site](#). The Linux version supports Ubuntu, RHEL, CentOS, Oracle Linux, and SUSE.

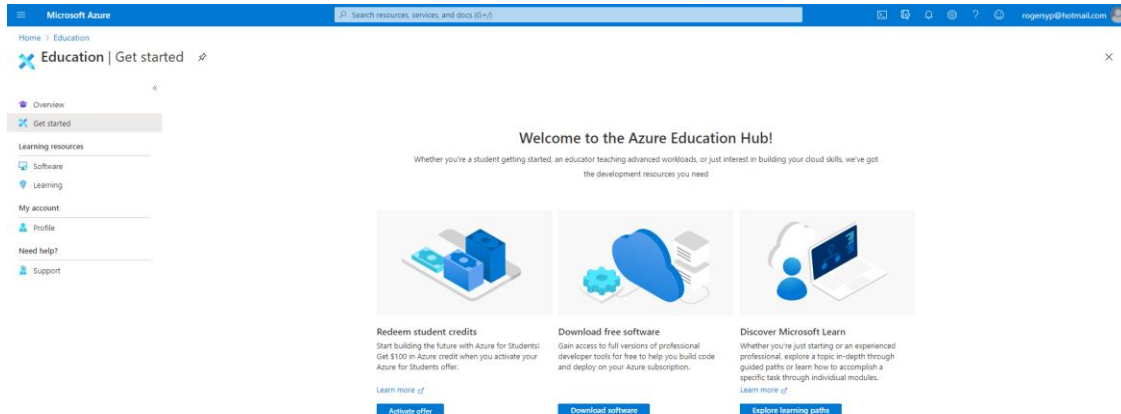
After downloaded VMware products, use the following video to complete the Virtual Machine setup (Note: you may skip the VMware download part).

<https://www.youtube.com/watch?v=mtxtqw95484>

## Part 1

Visual Studio is now available through the Microsoft Azure program.

**Step1:** To get started, visit <https://azureforeducation.microsoft.com/devtools> and log in using a Microsoft account. Ironically, Microsoft requires that you log in with a non-OSU email (if you have an existing account you can use it) and then verify your OSU email to obtain access. Once you are logged in, the main portal should look similar to the following:



**Step 2:** In order to access the Visual Studio download, go to Software, type “Visual Studio” in the search bar, and locate “Visual Studio Enterprise 2019”. You can view your assigned license key.

Microsoft Azure Search resources, services, and docs (G+)

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Visual Studio

Product category: All Operating System: All System type: 64 bit,Service  
Product language: English,Multilanguage

7 Items

Name ↑↓	Product category ↑↓	Operating System ↑↓	System type ↑↓	Language ↑↓
Visual Studio Enterprise 2019	Developer Tools	Windows	64 bit	Multilanguage
Visual Studio Code	Developer Tools	Windows	64 bit	Multilanguage
Agents for Visual Studio 2019 ...	Developer Tools	Windows	64 bit	Multilanguage
Agents for Visual Studio 2019 ...	Developer Tools	Windows	64 bit	Multilanguage
Remote Tools for Visual Studi...	Developer Tools	Windows	64 bit	English
Visual Studio Community 201...	Developer Tools	Windows	64 bit	Multilanguage
Visual Studio 2019 for Mac	Developer Tools	Mac	64 bit	Multilanguage

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Visual Studio Enterprise 2019	Developer Tools	Windows
Visual Studio Code	Developer Tools	Windows
Agents for Visual Studio 2019 ...	Developer Tools	Windows
Agents for Visual Studio 2019 ...	Developer Tools	Windows
Remote Tools for Visual Studi...	Developer Tools	Windows
Visual Studio Community 201...	Developer Tools	Windows
Visual Studio 2019 for Mac	Developer Tools	Mac

**Software**  
Education

Visual Studio Enterprise 2019

An integrated, end-to-end solution for developers looking for high productivity and seamless coordination across teams of any size.

**Operating System**  
Windows

**Product language**  
Multilanguage

**System**  
64 bit


View Key

Generate URL

**Step 3:** To download Visual Studio Enterprise 2019, go to <https://docs.microsoft.com/en-us/visualstudio/releases/2019/release-notes>, and select “Enterprise 2019” in the dropdown list. And your download should start shortly.

# Visual Studio 2019 version 16.11 Release Notes

Article • 12/16/2021 • 22 minutes to read

Is this page helpful?  

## Tip

Watch the recordings of the Visual Studio 2022 launch event<sup>↗</sup> to learn about what's new, hear tips & tricks, and download free digital swag.

[Developer Community](#)<sup>↗</sup> | [System Requirements](#) | [Compatibility](#) | [Distributable Code](#) | [License Terms](#)<sup>↗</sup> | [Blogs](#)<sup>↗</sup> | [Latest Release Known Issues](#)<sup>↗</sup> | [Whats New in Visual Studio Docs](#)

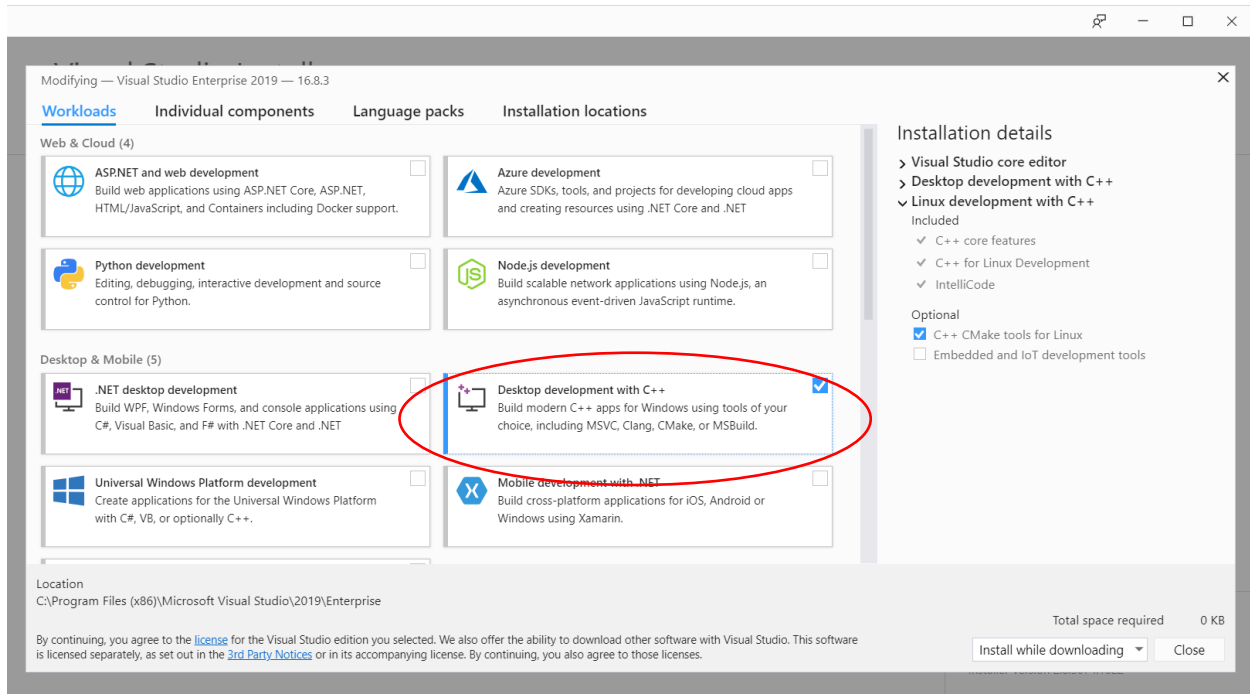
Click a button to download the latest version of Visual Studio 2019. For instructions on installing and updating Visual Studio 2019, see the [Update Visual Studio 2019 to the most recent release](#). Also, see instructions on [how to install offline](#).

Download Community 2019 

Download Professional 2019 

Download Enterprise 2019 

**Step 4:** Once download is finished, follow instructions to install the software on your PC (Note: you will need the 5X5 license key in step 2.) When you install Visual Studio, you will be asked to select your intended workload (e.g. how do you plan to use Visual Studio). You should select "Desktop development with C++" as that is the best option for our purposes. I suggest installing either the 2019 or the 2017 versions, since the newer versions of Visual Studio have better compatibility with Windows 10.



## Part 2:

In this video, Stephen Redfield explains how to install and configure the libraries provided by the textbook's author. <http://www.asmirvine.com/>

Note that the textbook website now contains updated libraries for Visual Studio 2019 so you can follow that tutorial directly (click the following link to view the video).

Note:

1. You may skip 64-bit and 16-bit tutorial as we will only use 32-bit program for this course

### Topics:

- [Tutorial: Building and running a 32-bit program](#)
- [Tutorial: Building and running a 64-bit program](#)
- [Building 16-bit programs](#)

2. If your antivirus reports a virus on the project that you download, you may:
  - a. Modify the setting and allow it to run
  - b. Use the sample project under `\\Irvine\\examples\\Project32_VS2019` instead

### Here's how to get started:

Right-click [here](#) to download the code examples and required libraries for the book. Unzip the downloaded file into a directory named Irvine on Drive C. Next, [Right-click here to download a zip file containing a 32-bit Visual Studio 2019 project](#). After downloading, extract the Zip file into any folder on your computer. Finally, [Right-click here to download a zip file containing a 64-bit Visual Studio 2019 project](#). You can extract this file into any folder on your computer. Now you are ready to begin the tutorials listed below.

[https://media.oregonstate.edu/media/1\\_u2rpcwp3](https://media.oregonstate.edu/media/1_u2rpcwp3)

### **Part 3:**

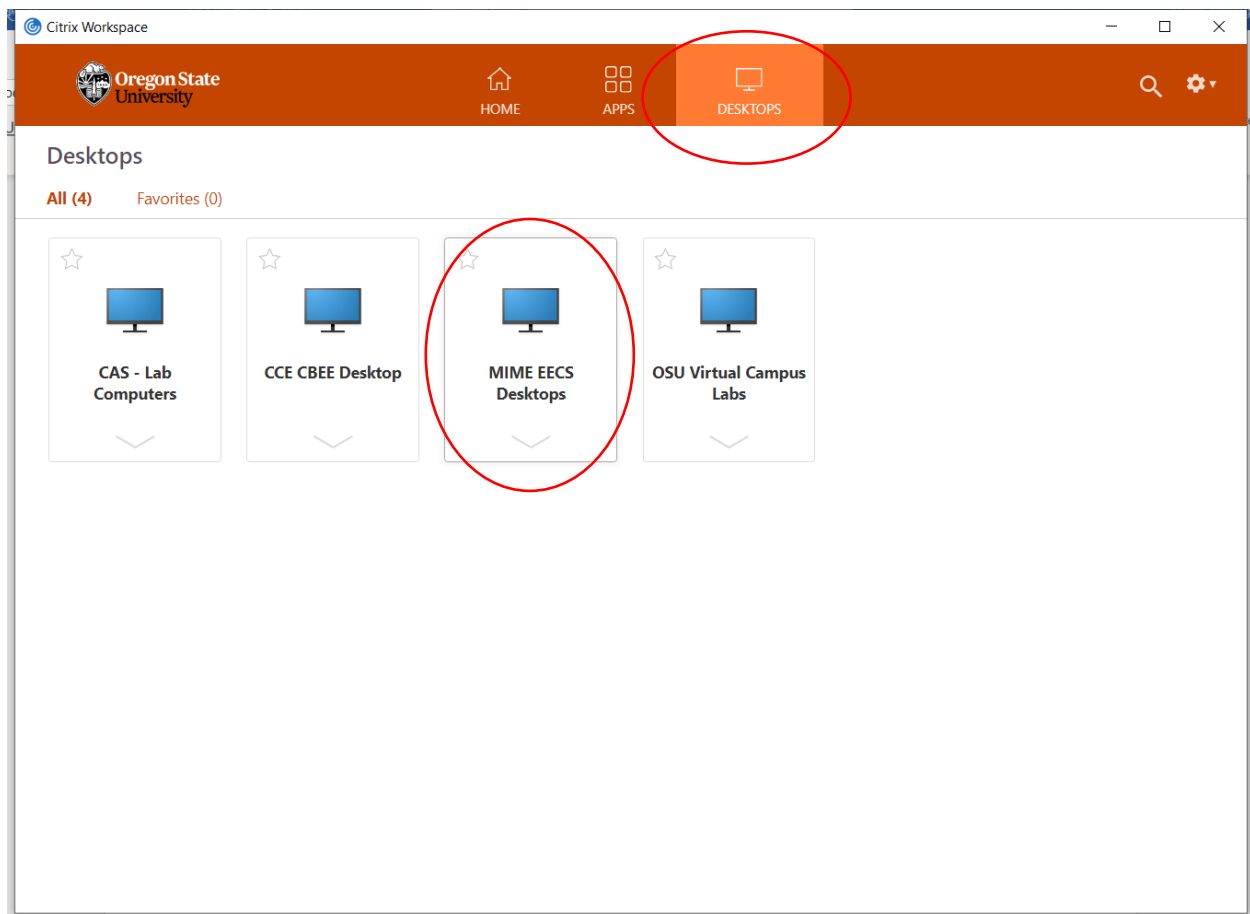
This last video shows how to start a new Assembly code project and verify that Visual Studio is installed properly.

[https://media.oregonstate.edu/media/1\\_5qfbq9od](https://media.oregonstate.edu/media/1_5qfbq9od)

### **Using Citrix (not required)**

Citrix is a software product that allows you to access programs on a remote computer as if you were sitting at the desktop. Personally, I **strongly recommend that students install Visual Studio on their local computer**, rather than using Citrix. However, if you want to try it, you should be able to access Visual Studio on our [OSU Citrix Servers](#) as follows:

Once download, open Citrix, choose the “Desktop” choice at the top of the screen after you are logged in and then the “MIME EECS Desktops” choice.



This will create a session as if you were logged on to an on-campus lab computer. In the Citrix session, download the updated zip file [here](#) and extract it to

**z:\bin\CS271\**

You will have to make this folder (it does not exist by default). All your projects should live in this directory, since in order to execute code on Citrix the executable should be in the bin folder or a subdirectory thereof. Also note that you need "execute" permissions in the 'bin' folder, which may or may not be set by default. If you are having trouble with this folder, they can create/reset it [here](#).

NOTE 1: You do not have to download/install the Irvine .msi file if you use the Citrix machine (in fact it won't let you). But you will have to transfer it from the network drive V:\Irvine (which should be mapped to "\\stak\engr.oregonstate.edu\" to the network drive Z:\Irvine and update the project properties. Once you get to the point where you're opening a project, do the following:

1. Open the Project.sln from "Z:\bin\CS271\Project32\_VS2019 " after you've extracted it to this location (one of the videos shows you this).
2. Select Project (from the top menu) -> Project Properties
3. In the project properties window select "Linker"
4. On the right you should see "Additional Library Directories:" and c:\Irvine part of the listing here
5. Change c:\Irvine to Z:\Irvine
6. Now select "Microsoft Macro Assembler" from the same part you selected "Linker"
7. Under "Include Paths" change c:\Irvine to Z:\Irvine
8. File->Save All
9. Close Visual Studio, and re-open Project.sln from the same directory.

NOTE 2: Be aware that the files will NOT reside on your home computer, and if you want them on your computer/laptop you'll have to transfer them using an SFTP utility.

## **Common issues with Visual Studio setup**

1. LNK1104 cannot open file 'Irvine32.lib'

If you're getting this error, it's likely that you did not extract the Irvine library files into the correct folder. Ensure that the folder structure is such that the Irvine32.lib file exists in the C:\Irvine\Irvine32.lib folder and try again. The most common issue is that you will end up with the following incorrect path due the zip extraction process:  
"C:\Irvine\Irvine\Irvine32.lib".

2. "File not found" or "cannot execute the specified program" errors

Visual Studio generates executable programs (.EXE files) that run when after you assemble your source code for your programming assignments. Even after working fine for a while, at some point you may see an error message that the file cannot be found, or your program prints the message "The system cannot execute the specified program." This probably means your antivirus program has falsely identified your executable program as a threat (false positive) and block it from running. Exclude your entire CS271 folder (and all its subfolders) from being virus scanned, and you should be able to proceed without further antivirus interference with your work.

3. INCLUDE errors: By installing additional extensions beyond what is required for this course, the INCLUDE structure may be prone to error.

Please ensure that the path "C:\Irvine" is explicitly written in the Project Properties in the two fields specified below:

To enter the Project Properties select the "Project" menu, then select "Project Properties". Or, right click "Project" in the Solution Explorer and select "Project Properties"

- Configuration Properties → Linker → "Additional Library Directories" should be: "c:\Irvine;%(AdditionalLibraryDirectories)" (without quotes).
- Configuration Properties → Microsoft Macro Assembler → "Include Paths" should be: "c:\Irvine" (without quotes).

4. Eliminating the "... exited with code 0." message

If when you run a program, the message ".... (process xxxxxx) exited with code 0." becomes annoying, here are the steps to keep that message from showing:

- From with Visual Studio select the "Debug" menu, then select "Options".
- Under Debugging > General, ensure "Automatically close the console when debugging stops." is checked.
- Run your program again. The message should be gone.

5. Syntax Highlighting

By default, Visual Studio does not include syntax highlighting for Assembly code. This can sometimes make it more difficult to read your source code. To enable syntax highlighting in Visual Studio 2015 or later, you may want to install AsmDude:

- From within Visual Studio select the "Extensions" menu, then select "Manage Extensions".
- Search for AsmDude, select it, click Download, and wait for it to complete.
- Close Visual Studio and a VSIX Installer dialog will pop up asking for permission to install AsmDude. Let it do so.



- Reopen Visual Studio. MASM syntax highlighting support should now be installed.
- Disable syntax highlighting options that interfere with the INCLUDE Irvine32.inc statement: Go to Tools>Options>AsmDude, find the Intellisense section, and uncheck the "Show in error list" and "Decorate with Squiggle" options for Undefined Labels, Clashing Labels, and Undefined Includes, then click OK.
- If you are unable to complete Project 0, disable AsmDude.
- If you use the dark Visual Studio color scheme, you can change the color of certain text to be more readable. Go to Tools>Options>AsmDude and change the color for Mnemonic.
- Special note: if you are an advanced Visual Studio user and want to use its native (and imperfect) MASM syntax highlighter, you must choose it or AsmDude -- you cannot use both at the same time.

#### 6. "Inconsistent Line Endings" error from Visual Studio

A fairly catch-all solution to this is eliminating any non-Unicode characters from your .ASM file. To do this...

- Copy the entire body of your .ASM file.
- Paste it into a non-formatting text editor like Notepad. Save this copy to be sure you don't lose anything.
- Open a new, working project (copy one known to work from a different folder, or use the clean template from the Canvas site)
- Copy everything from the Notepad file into this new, clean project file and try running again.

#### 7. Windows Environment Variables

It is recommended you do not try to locate, read, or alter any environment variables created and assigned by Visual Studio. VS has a complex way of managing them while it is running, and using them is way beyond the scope of what is needed in CS 271.

## Visual Studio Debugger Settings

You may follow instructions here to customize your debugger settings:

<http://asmirvine.com/debug/vstudio2019/index.htm>