Course software installation instructions EDH7916 | Summer C 2020

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Overview

This course requires you to install a few bits of software on your computer. Specifically, you need:

- R
- RStudio
- LaTeX

These instructions should help you find and download what you need. You do not need to use this guide, but it may help, particularly if you aren't used to downloading and installing open source software.

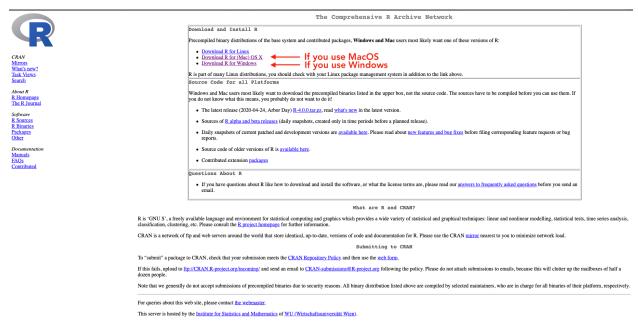
I've done my best to include screenshots of each step. One snag, however, is that while some in the class may use Windows/PC, others use Apple/MacOS (I'm making the assumption that no one is using Linux — if you are, you probably don't need these instructions!). I personally use MacOS. This means that some of the screenshots are based on what I see

as a Mac user on the software websites. But where I can, I show sections for MacOS and Windows downloads.

I also can't walk you through each step of the installation once you've downloaded the correct files, again, because operating systems differ. That said, he good news is that with only one exception (sorry Windows users!), you should be able to install all software using the default process like you do with most other software.

Installing R

First things first, we'll get R, which you can find at https://cran.r-project.org. Depending on your operating system (OS), you'll click one of the following links at the top of the home page.



MacOS

When downloading R for MacOS, you'll want to click the link for the latest version of R: R-<#>.<#>.exp.seq where <#>.<#> represent the major, minor, and patch numbers. As of the writing of this document (May 2020), the latest version of R is R 4.0.0 — it may be different (higher) when you download. Just grab the one inside the red box.

You may be asked if you want to allow the download. If so, say yes and pay attention to where you save it (typically your Downloads folder). Once it has finished downloading, double click on the package icon and follow the default directions to install.

		R for Mac OS X		
		ackages to run on Mac OS X (release 10.6 and above). Mac OS 8.6 to 9.2 (and Mac OS X 10.1) are no longer supported but you can find the last supported release of R for OS X systems (through Mac OS X 10.5) and PowerPC Macs can be found in the old directory.		
	Note: CRAN does not have Mac OS X systems and cannot of	Note: CRAN does not have Mac OS X systems and cannot check these binaries for viruses. Although we take precautions when assembling binaries, please use the normal precautions with downloaded executables.		
CRAN	Package binaries for R versions older than 3.2.0 are only av-	ailable from the CRAN archive so users of such versions should adjust the CRAN mirror setting (https://cran-archive.r-project.org) accordingly.		
Mirrors What's new?		R 4.0.0 "Arbor Day" released on 2020/04/24		
Task Views Search	Please check the MD5 checksum of the downloaded image 1 nd5 R-4.0.0.pkg	to ensure that it has not been tampered with or corrupted during the mirroring process. For example type		
About R R Homepage		he R-4.0.0.pkg image. On Mac OS X 10.7 and later you can also validate the signature using		
The R Journal		Latest release:		
Software R. Sources R. Binaries Packages	<u>R-4.0.0.pkg</u> (notarized and signed) SHA1-http://staatestaat	8.4.0.9 binury for mac/S0 10.13 (High Sierra) and higher, signed and notarized package. Contains R 4.0.0 framework, R app C011.71 in 64-bit for Intel Mass, Tcl/Tk 8.6.6 X11 libraries and Texinfo 6.7. The latter two components are optional and can be ommitted when choosing 'custom install', they are only needed if you want to use the ext. R kackage or build package documentation from sources.		
Other Documentation	Click this link, allow the	Note: the use of X11 (including telth) requires <u>XQuartz</u> to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your macOS to a new major version.		
Manuals EAQs Contributed	download, and follow the instructions to install	Important: this release uses Xcode 10.1 and GNU Fortran 8.2. If you wish to compile R packages from sources, you will need to download and GNU Fortran 8.2 - see the tools directory.		
	NEWS (for Mac GUI)	News features and changes in the R.app Mac GUI		
	Mac-GUI-1.70.tar.gz MD5-halt: b1cf5128526496891229658688008	Sources for the R.app GUI 1.70 for Mac OS X. This file is only needed if you want to join the development of the GUI, it is not intended for regular users. Read the INSTALL file for further instructions.		
	Note: Previous R versions for El Capitan can be found in th	e <u>el-capitan/base</u> directory.		
		Binaries for legacy OS X systems:		
	<u>R-3.6.3.nn.pkg</u> (signed) 3HA1-taak: c#02/0619964547786505869aa25e912353557c4 (ca. 77MB)	R 3.6.3 binary for OS X 10.11 (El Capitan) and higher, signed package. Contains R 3.6.3 framework, R app GUI 1.70 in 64-bit for Intel Macs, Tei/Tk 8.6.6 X11 libraries and Texinfo 5.2. The latter two components are optional and can be ommitted when choosing "custom install", they are only needed if you want to use the vel-tack R package or build package documentation from sources.		
	R-3.3.3.pkg MD5-hash: 893ba10101036666e19866e1801fibrf SHA1-hash: Sav71b000b15805695918608c48972d51ce14027 (ca. 71MB)	R 3.33 binary for Mac 0S X 10.9 (Mavericks) and higher, signed package. Containts R 3.33 framework, Rapp GUI 1.69 in 64-bit for Intel Macs, Tel/Tk 8.6.0 XII libraries and Texinfo 52. The latter two components are optional and can be ommitted when choosing "custom install", it is only needed if you want to use the text R package or build package documentation from sources.		
		Note: the use of X11 (including teltx) requires XQuartz to be installed since it is no longer part of OS X. Always re-install XQuartz when upgrading your OS X to a new major version.		
	R-3.2.1-snowleopard.pkg M35-bab. 5864801314646555896669944605 SIA1-bab. before file 132w2202488681crelef868ceeb30 (ca. 685MB)	R 3.2.1 legacy binary for Mac OS X 10.6 (Snow Leopard) - 10.8 (Mountain Lion), signed package. Contains R 3.2.1 framework, R.app GUI 1.66 in 64-bit for Intel Mas How The Terms and Terminopy Control (UL) (Rapp), Tel/TR 5.60 X111 libraries and Texinfop 5.2. GNU Fortran is NOT included (needed if you want to comple packages from sources that contains IPORTRAN code) please see the local directory. NOTE: the binary support for OS X before Mavericks is being plased out, we do not expect further releases!		
	The new R.app Cocoa GUI has been written by Simon Urba	nek and Stefano Iacus with contributions from many developers and translators world-wide, see "About R* in the GUI.		
		Subdirectories:		

Windows

When downloading R for Windows, you'll first be taken to an intermediate screen. Just click the indicated link to go to the next page.

		R for Windows
R	Subdirectories:	Click this link to go to next page
	base	Binaries for base distribution. This is what you want to install R for the first time.
CRAN	contrib	Binaries of contributed CRAN packages (for R >= 2.13.x; managed by Uwe Ligges). There is also information on third party software available for CRAN Windows services and corresponding environment and make variables.
Mirrors	old contrib	Binaries of contributed CRAN packages for outdated versions of R (for R < 2.13.x; managed by Uwe Ligges).
What's new?	Rtools	Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.
Task Views Search	Please do not submit binaries to CRA	N. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windows binaries.
About R	You may also want to read the R FAQ	and R for Windows FAQ.
R Homepage The R Journal	Note: CRAN does some checks on the	ese binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.
Software R. Sources R. Binaries Packages Other		
Documentation <u>Manuals</u> FAQs <u>Contributed</u>		

On the next screen, click the link to "Download $R-<\!\!\#\!\!>.<\!\!\#\!\!>$ for Windows" where

<#>.<#>.<#> represent the major, minor, and patch numbers. As of the writing of this
document (May 2020), the latest version of R is R 4.0.0 — it may be different (higher) when
you download. Just grab the one inside the red box.

You may be asked if you want to allow the download. If so, say yes and pay attention to where you save it (typically your Downloads folder). Once it has finished downloading, double click on the installation icon and follow the default directions to install.

Depending on the level of control you have on your computer and how you typically install software, you may want to install R as an administrator. I would recommend that to head off issues down the road, but if you don't have administrator privileges then go ahead an install as a user.



Installing RStudio

Now that you've installed R, it's time to get RStudio, the program we'll use to work with R. Start by going to the RStudio home page: https://rstudio.com.

At the very top, you'll see a link to "Downloads": click that.

R Studio	Products ~ Re	SOURCE SUPPORT COMMUNITY COMMUNITY SOURCE Pricing About Blogs >	
	product update, you can now sha		
	thon content with your stakehold		
	LEARN MORE		
	ntroducing RStudio Tea d professional data science solution for e		
R		۲	
RStudio Server Pro	RStudio Connect	RStudio Package Manager	

You'll be presented with a number of versions of RStudio to install. We'll choose the free desktop version (naturally!).

R Studio		Products	POWNLOW Resources V Pricit	•	
	Dov	vnload RStu	ıdio	nter Catenary Press	
Choose Your RStudio is a set of integrati productive with R. It inclue supports direct code exect viewing history, debugging	ed tools designed to help des a console, syntax-hig ution, and a variety of rot g and managing your wo	hlighting editor that oust tools for plotting,	professional da Team includes	R Studio Team solution for every ta science team. RStudio Studio Package Manager.	
	RStudio Desktop Open Source License Free DOWNLOAD	RStudio Desktop Commercial License \$995 /year BUY	RStudio Server Open Source License Free DOWNLOAD	RStudio Server Pro Commercial License \$4,975 /year (\$ Named Users) BUY	

You'll now see a button to download RStudio. Step (1) is to download R, but we've already done that so we're good.

One thing: the RStudio website is smart and tries to guess your OS so that it can present you with a big button to download the correct version. As you can see, it worked for me: I'm

shown a button to download RStudio for MacOS. If you go to the website on a computer using Windows, the button should instead be a link to install RStudio for Windows. If all works, then you can click the button either way (yours just may look different), download, and install as normal. If the button doesn't have your correct OS, then go to the next step.

NOTE: This box will be different if you are using a PC, meaning you should be able to click it to get what you need	RStudio Desktop 1.2.5042 - Release Notes 1. Install R. RStudio requires R 3.0.1+. 2. Download RStudio Desktop. Recommended for your system: 1. Install R. Brownload RStudio Studio FOR MAC 1.2.5042 122.65M8 Requires macOS 10.13+ (4-bit) LInstallers Linux users may need to import RStudio's public code-signing key prior to installation, depending on the opera RStudio 1.2 requires a 64-bit operating system. If you are on a 32 bit system, you can use an older version of RS				
either way	OS	Download	Size	SHA-256	
	Windows 10/8/7	▲ RStudio-1.2.5042.exe	149.84 MB	5d4cd644	
	macOS 10.13+	& RStudio-1.2.5042.dmg	126.89 MB	74ea68eb	
	Ubuntu 14/Debian 8	🛓 rstudio-1.2.5042-amd64.deb	96.41 MB	485e2757	
	Ubuntu 16	🛓 rstudio-1.2.5042-amd64.deb	104.07 MB	e2f15cc2	
	Ubuntu 18/Debian 10	🛓 rstudio-1.2.5042-amd64.deb	104.93 MB	99e0f57b	
	Fedora 19/Red Hat 7	▲ rstudio-1.2.5042-x86_64.rpm	119.75 MB	5ab559e2	
	Fedora 28/Red Hat 8	🛓 rstudio-1.2.5042-x86_64.rpm	120.39 MB	cb962044	
	Debian 9	🛓 rstudio-1.2.5042-amd64.deb	105.40 MB	92684c84	

Just below the big button, you'll see the full list of RStudio versions. You can also pick your correct version here. Same as before, just click the link, download, and install as normal.

All Installers

Linux users may need to import RStudio's public code-signing key prior to installation, depending on the operating system's security policy. RStudio 1.2 requires a 64-bit operating system. If you are on a 32 bit system, you can use an older version of RStudio.				
os	Download	Size	SHA-256	
Windows 10/8/7	RStudio-1.2.5042.exe Windows	149.84 MB	5d4cd644	
macOS 10.13+	& RStudio-1.2.5042.dmg	126.89 MB	74ea68eb	
Ubuntu 14/Debian 8	🛓 rstudio-1.2.5042-amd64.deb	96.41 MB	485e2757	
Ubuntu 16	🛓 rstudio-1.2.5042-amd64.deb	104.07 MB	e2f15cc2	
Ubuntu 18/Debian 10	🛓 rstudio-1.2.5042-amd64.deb	104.93 MB	99e0f57b	
Fedora 19/Red Hat 7	🛓 rstudio-1.2.5042-x86_64.rpm	119.75 MB	5ab559e2	
Fedora 28/Red Hat 8	🛓 rstudio-1.2.5042-x86_64.rpm	120.39 MB	cb962044	
Debian 9	🛓 rstudio-1.2.5042-amd64.deb	105.40 MB	92684c84	
SLES/OpenSUSE 12	🛓 rstudio-1.2.5042-x86_64.rpm	98.88 MB	a419cef8	
OpenSUSE 15	🛓 rstudio-1.2.5042-x86_64.rpm	106.56 MB	c050eb25	
Zip/Tarballs				
os	Zip/tar	Size	SHA-256	
Windows 10/8/7	🛓 RStudio-1.2.5042.zip	219.03 MB	76a7c2f2	
Ubuntu 14/Debian 8	🛓 rstudio-1.2.5042-amd64-debian.tar.gz	144.32 MB	8e830b95	

Installing LaTeX

LaTeX is a document typesetting system/language. While it's probably best known for its ability to nicely typeset mathematical equations, LaTeX works really well quantitative research workflows. That said, it can be difficult to install and work with.

We'll use LaTeX later in the semester so that you can make nice PDF reports. The good news is that you won't really need to interact with LaTeX at all to do so — other than to install it now.

Since you don't need a full TeX distribution on your computer, you can most likely get by using the TinyTeX distribution that we can install directly from R. If you want a full version of TeX on your computer (**NOTE:** It's very large), then skip to the full installation for your computer.

TinyTex

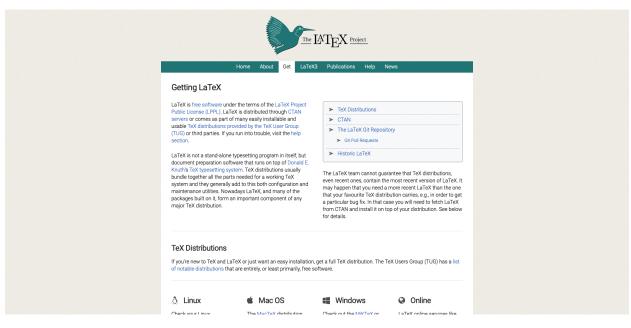
Once you've installed R and RStudio, open RStudio and type the following in the Console:

```
install.packages("tinytex")
tinytex::install_tinytex()
```

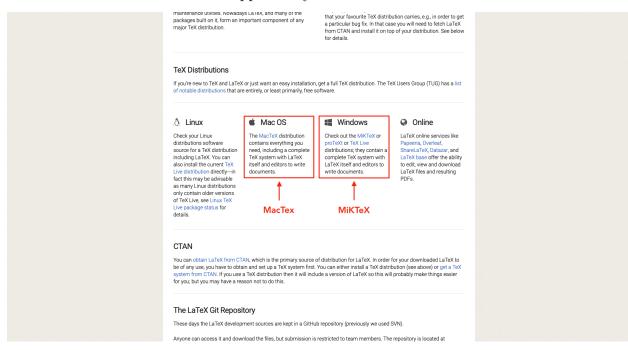
This will install the tinytex R package and then install the TinyTeX distribution (it may take a minute or two).

OPTIONAL: Full installation

If you want the full installation, first go the LaTex home page at https://www.latex-project.org.



If you scroll down slightly, you'll see options for MacOS (MacTeX) and Windows (MiKTeX) installations. Click the link that applies to your OS and follow the instructions below.



MacOS

On the MacTeX home page, first click the link for the MacTeX Download.





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The MacTeX-2020 Distribution

The current distribution is MacTeX-2020 This distribution requires Mac OS 10.13, High Sierra, or higher and runs on Intel processors.

To download, click MacTeX Download.

You can also install TeX Live 2020 using the TeX Live Unix Install Script. This method supports MacOS 10.6, Snow Leopard, and higher and runs on Intel processors.

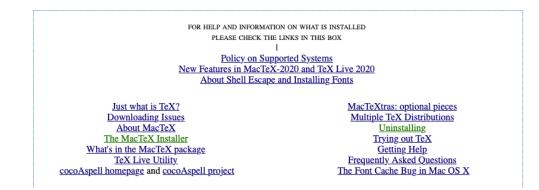
To download, click Unix Download.

To download the smaller BasicTeX, click Smaller Download.

For suggestions on keeping TeX up to date, go to Update Schedule.

To Obtain Older Versions of MacTeX If You Are Running Mac OS 10.3 through 10.12, click here

The link below leads to other optional download packages: <u>MacTeXtras: optional pieces</u>



On the next page, click the link for MacTeX.pkg, agree to download, and then double click on the downloaded file to install. Note that this package is very big (~ 4GB) because you are downloading just about everything TeX-related, including some software. It's what I use, but I use TeX all the time. Just know this in case your storage space is limited on your computer.





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Downloading MacTeX 2020

To obtain the distribution, click the link below. While downloading, please skim read the rest of the page. Users who run into trouble often write us without noticing that the solution is on this very page. All install packages are developer-signed and notarized by Apple.

> MacTeX-2020 requires macOS 10.13, 10.14, or 10.15 High Sierra, Mojave, or Catalina



[approximately 4.0G - 08 April 2020] The MD5 sum is **f20cf74887e5fee800f78953bfbf6a01**

The SHA512 sum is 157c64c8c3c7a33e83dbb28c6ebc7e0fa64c9054deb69ca78f70a0f171b9ccf13221bd7b8008e944aae5b3347b5f631ec412e85585601e77356646ed94c644bd Download with Safari strongly recommended

Installing MacTeX

After downloading, move the file MacTeX.pkg to the desktop or another convenient spot, and double click it to install. Follow the straightforward instructions. Installation on a recent Macintosh takes about ten minutes

The installer presents a Welcome page. Then it presents a ReadMe page with more information. It presents a Software License page, and then a Final Page; clicking the "Install" button on this page will start the actual installation. The final page also has a "Customize" button, which leads to a panel allowing users to decide which pieces to install: Ghostscript, the Ghostscript Library, the GUI applications, and TeX Live itself. Most users will take the standard installation and ignore "Customize". Users who use MacPorts or HomeBrew may prefer to use the Ghostscript provided by these projects; if so they should use "Customize" to disable Ghostscript installation.

At the end of installation, the installer will report "Success." But sometimes, the installer puts up a dialog saying "Verifying..." and then the install hangs. In all cases known to us, rebooting the Macintosh fixes this problem. After the reboot, install again.

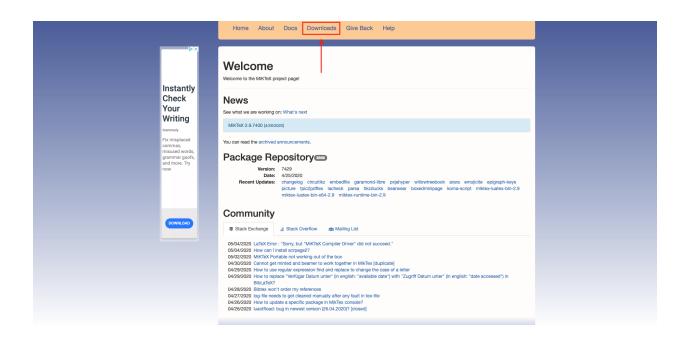
If other problems are reported during installation, skip to the section "Installation Errors" below.

MacTeX writes a symbolic link /Library/TeX/texbin which indirectly points to the TeX Live binary directory. Configure your GUI programs to use this link. The GUI programs we supply should automatically configure themselves. On older systems, you may have seen the link /usr/texbin which did the same thing. When Apple produced El Capitan, they modified the system so users could no longer write directly to the /usr directory and this rule remains in effect today. Therefore we replaced /usr/texbin with /Library/TeX/texbin.

MacTeX installs TeX Live, the actual TeX Distribution. in /usr/local/texlive/2020. a location often hidden in the Finder. Most users access TeX using a "front end". a program

Windows

Once you reach the Windows (MiKTeX) homepage, click the Downloads link at the top of the page.



On the next screen, you'll want to click on the blue "Download" button, agree to the download, and then install.

ONE NOTE MiKTeX is much smaller than MacTeX, but that's because it doesn't download everything. Instead, it opts to only install packages as you need them. Cool, expect that doesn't always work well with RStudio.

The fix is this: when going through the installation, on the "Settings" screen, be sure to change the default selection for "Install missing packages on-the-fly" from "Ask me first" to "Always". Continue the installation with the other default options.

Settings

The wizard allows you to set the preferred paper size:



You also have the option to change the dault behavior of the integrated package installer. Select Ask me first, if you want to confirm installation of required packages. Select Always, if required packages are to be installed without confirmation. Select Never, if you disallow the installation of missing packages.

All the preferences can be changed later.

Click Next, to go to the next page.