

# CS-4501/SYS-4582

## F1/10: Autonomous Racing

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### Installing Ubuntu on a Virtual Machine

The following instructions are for installing Ubuntu 14.04 because it supports ROS Indigo and it allows you to program in the same environment as the on-board computer, the NVIDIA Jetson TK1. If installing a different version of Ubuntu ( 16.04 ) replace the OS images appropriately.

1. Download the desktop image which is appropriate for your machine: <http://releases.ubuntu.com/14.04/> It is recommended to download the 32-bit version. You may want to use a torrent client like BitTorrent to download the image faster.
2. If you want to explore installing the OS directly on your machine, dual booting etc., a comprehensive installation instruction can be found here: <http://howtoubuntu.org/how-to-install-ubuntu-14-04-trusty-tahr>
3. For the course, installing a virtual machine on your laptop and installing ubuntu within the VM is enough. To do so, go to <https://www.virtualbox.org/wiki/Downloads> and download the Virtual Box application for your host operating system.
4. In the same page as above, download the extension pack to support USB 2/3 devices and NAT drivers.
5. Install the Virtual Box application on your host machine and enable the Extension Pack. Watch this [video](#) for reference. Do not get lost watching random Youtube videos, so resume the installation.
6. Follow [this tutorial](#) to install the Ubuntu 14.04 Trusty OS in your Virtual Environment and set the virtual box parameters, but point your Virtual Machine application to the directory where you downloaded the Ubuntu image.
  - (a) Memory: 4GB Recommended
  - (b) Storage: Dynamically allocated - at least 10-15 GB, more if possible.
  - (c) Video RAM: Minimum of 128MB
7. Launch the new Virtual Machine and follow the on screen instructions to finish installing the operating system including setting up your user name, password and theme. That's it, you are now ready to install ROS using Tutorial 0b.
8. **NOTE for OS X users:** Virtualbox has recently been known to run slowly on the latest versions of Mac OS X. IN some cases, allocating enough RAM (>4GB) and VRAM can fix this but if the VM is painfully slow on OS X and unusable then we encourage you to install Parallels [paid software] and install Ubuntu using that.
9. NOTE for all users: If you have display troubles with VirtualBox in which the Ubuntu window does not scale to full screen Mount the Guest Additions by selecting Devices --> Insert Guest Additions CD image... Follow the prompts to run and install the guest editions. reboot. the vm should scale to full screen easily.