

## Computer Recommendations for CIT Students

### February 2019

Due to the nature of the CIT program and college in general it is recommended that students have a laptop computer rather than a desktop. A laptop can be used to take class notes, work on projects at group meetings, or where/whenever a student has a few extra minutes to work.

The key when selecting a laptop is to balance size, weight, power, and battery run time. Of these factors the most important is battery run time: It doesn't matter how fast the computer is or how nice the screen looks if the battery dies halfway through the day. A run time of at least 5-6 hours on a full charge should be sufficient.

Weight is subjective, but a nine plus pound desktop replacement is too heavy to carry around consistently and a super lightweight machine will have too small of a keyboard for fast typing and inadequate enough battery run time to make it through a day. Shoot for something in the middle. You want something full featured, yet not a brick.

There are some significant advantages to a laptop with a touch screen and/or active digitizer for note taking. However, these tend to cost more than normal laptops and limit some of your other choices as there are fewer choices available in the marketplace.

In CIT, students will need to use several Windows-only applications. A computer running Windows natively, an Apple Macintosh, or an Intel based Linux solution can all be configured to meet this requirement.

Tablets such as the Apple iPad or Samsung Galaxy Tab are useful complements to a laptop for reading books and consuming media, but are inadequate for most coursework.

Newer Windows 10 compatible laptop/tablet hybrid devices such as the Microsoft Surface Pro or Samsung Galaxy Book are acceptable, but have limitations in keyboard quality and connectivity options that may make them less desirable than a traditional laptop.

A laptop computer for use by a CIT student should meet the following criteria:

#### Processor

- An Intel Core i3/i5/i7 multi-core processor is adequate for all work required in CIT
  - A 7<sup>th</sup> or 8<sup>th</sup> generation processor (Kaby Lake or Coffee Lake) processor is strongly preferred
    - Earlier chips use more power and will be dropped from support by high end software sooner

#### Memory

- 8 GB RAM is the **bare** minimum – 16+ GB RAM is **strongly** recommended
  - Anything less will not properly run some of the required software
  - Especially when students are implementing virtual machines
- Note that newer, thinner laptop options often have the memory soldered to the system board and are not upgradable later

## Hard Drive

- Hard Drive of **at least** 256 GB capacity
  - 500 GB or more is recommended - More is better
- Solid state drives are highly preferred
  - Much faster boot and application launch
  - More physically durable
- For a traditional magnetic spinning drive choose a 7200 RPM option
  - A 4800 or 5400 RPM drive will be significantly slower, especially at boot time
  - 10K RPM drives offer little real world performance improvement in laptop applications while creating more heat and reducing battery run time

## Networking

- Built-in WiFi required
  - 802.11ac at a minimum
- Bluetooth is required
  - A small USB Bluetooth transmitter can be added for little cost if built-in bluetooth is not available on a given model
  - Bluetooth 3 is the minimum
    - Bluetooth 4 (also known as Bluetooth Smart or Bluetooth Low Energy) is preferable
- Gigabit Ethernet port highly recommended
  - Either built-in or a dongle/USB 3.0 solution
- A traditional telephone modem is not required and would likely never be used
- Built-in broadband wireless service is not needed
  - Wireless LAN service is available across the Purdue campus, at most student residences (both on and off campus) , and at many local restaurants and shops
  - If broadband wireless service is needed in the future a USB connected solution can be added from the carrier that best services the area of need
  - Many newer cell phones have the ability to act as a broadband wireless gateway via a Bluetooth connection to the laptop if needed

## Removable Media

- Several USB flash drives
  - With the cost consistently coming down, five or more large (16+ GB) USB drives are recommended
    - Preferably in different colors/styles to easily distinguish among them
  - USB 3.0 drives are strongly preferred for speed considerations
- An optical rewritable drive (burner) is a nice feature to have
  - DVD or Blu-ray (preferred)
  - USB attached solutions are fine

## Screen

- 12-15 inch wide built-in screen recommended
  - Anything smaller than 12 inches is difficult to use
  - Anything larger than 15 inches adds weight and reduces battery run time
  - Be sure to get a wide screen as the format will ensure a better keyboard layout

## Battery

- Get the highest capacity battery available - This is the one area where weight considerations should not be taken into account.
  - Battery capacity should be given in milli-amp hours (mAh): larger values are better
  - If battery choices are presented as number of cells instead of mAh, larger numbers of cells typically have more capacity

## Operating System

- A 64 bit version of Windows is required
  - Windows 10 is available free to CIT students once they arrive on campus as part of the Microsoft Imagine program to which CIT subscribes
- For Apple Machines, BootCamp, Parallels, VirtualBox, or VMware Fusion are required to run Windows and Windows applications
  - VMware Fusion is available free as part of the VMware Academic Program to which CIT subscribes
- Linux is also a viable operating system choice
  - Ubuntu is the most widely supported Linux client distribution and is freely available
  - A Linux machine can be configured to dual boot into Windows to run required Windows applications or use a free virtualization product such as XEN or KVM to run Windows within Linux

## Software

- If there is a choice in bundled software, don't buy Microsoft Office as a student version can be purchased very inexpensively through the university once the student has their campus login
  - Depending on the current contents of the Microsoft Imagine program, it may even be available to CIT students at no cost
- There are several other discounted software packages available to Purdue students as well
  - For more information see <http://www.itap.purdue.edu/shopping/software>

## Optional Accessories

- A Second flat panel monitor for use at a home desk along with a port replicator/docking station and full size keyboard and mouse is recommended
  - The best laptop keyboard offers poorer feel than the cheapest full size keyboard
  - At a minimum a second charger (power brick) should be purchased
- A large (1TB+) USB attached external drive for backup purposes
  - These are available for under \$100
- Although all dorms have printers available, a local basic black and white laser printer is very convenient
  - These are available for as little as \$100 and are much faster and inexpensive to operate than inkjet printers
    - Brother in particular makes some very nice, inexpensive laser printer solutions
  - Maintaining an inkjet printer is like lighting \$20 bills on fire

## Opinion

If I were to choose a computer for my son/daughter today I would choose a laptop with an Intel i7, 16 GB RAM, a 500+ GB solid state drive, 802.11ac wireless, built-in Bluetooth 4, and an active digitizer (pen). This can be purchased for as low as \$1200 depending on brand/features.

Similar configurations are available from many vendors including Microsoft, Dell, Fujitsu, HP, Lenovo, and Toshiba. While the digitizer functionality adds a bit of cost, in my opinion the advantage of being able to sketch diagrams and formulas by hand when taking notes makes it worth the added expense.