Purchasing a Personal Computer

Overview

We're often asked, "What's the best kind of computer to bring to Carleton?" The honest answer is that there isn't really a "best kind;" it's more of a "best fit". The best computer for any person is a computer that they are comfortable using, and that can do the work that they need it to do. For example, a person interested in video editing has a different "best" computer than someone who plans to spend most of their time reading articles or writing essays.

Regardless of the type, we do recommend that all students bring a computer with them to campus. The computer purchasing portal (details below) provides a great start on recommended specifications and models, and also offers a small discount on pricing. If purchasing a computer presents an unmanageable financial burden, the college has several ways to help meet demonstrated need. Please contact Austin Robinson-Coolidge for more information.

Comfort with a computer covers familiarity with and preference for the operating system and software. For example, do you prefer Windows or macOS? Comfort also refers to the physical size and build of the machine. A larger screen will be easier to read, but will also be heavier. Keyboard layout and wrist space will influence your comfort when typing. Ideally, you should test any given computer before you invest in it. Try the machine out in a local store, put it through its paces, and form your own opinion.

For most students, a mid-range laptop from a reliable brand will be flexible enough to cover the majority of their academic and residential needs. If you truly want the best fit, you need to take the time to think through the ways that you intend to use the computer. What are the most important needs which it must fulfill? The remainder of this article will attempt to guide you through these considerations.

Computer Purchasing Portal

In conjunction with the our computer purchasing vendor, CDW-G, Carleton is able to offer a Computer Purchasing Portal for our students, faculty, and staff. The site offers a number of bundles featuring laptops that meet our recommended baseline (or mid-tier) specifications, but also allows you to choose whatever options or equipment you feel best suits your needs or means. Equipment purchased through this portal is offered featuring Carleton's purchasing discount through CDW-G.

If you have any questions on the following information, please don't hesitate to contact the ITS Helpdesk via our support portal at go.carleton.edu/helpdesk, by phone at 507-222-5999, or through email at helpdesk@carleton.edu.

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The first time that you try to sign on to this site, you will need to use the "Forgot Password" feature. When prompted, enter your full Carleton email address for both Username and Email Address. You will then receive an email allowing you to set a password.
Note that our bundles do include the accidental damage warranty, which we feel is a must-have for college-bound laptops. Since modern laptops offer fewer component-level repair options, the cost of fixing the damage arising from a single drop or spill can easily justify the cost of the warranty.

Specs and Suggestions

Below, you will find our recommendations for three levels of price/performance. In some cases, we have provided specs and a couple of few examples of specific machines that meet those specs (please see our disclaimer). This can be a little tricky because manufacturers revise their product lines with surprising regularity. Below the specs, we’ve provided information on a few additional factors that may influence your decision.

A note on terminology...

If you need a quick refresher (or a crash course) on technology terms, please take a look at this Beginner's Guide to Reading Computer Specifications.

Baseline Model (Mid-Tier)

For our baseline, we try to describe the best value machine that will function well for all four years of a student’s Carleton career. This takes into consideration the progressively increasing demands of operating systems and commonly used software for schoolwork and leisure. Our specification typically matches the equipment that Carleton’s ITS department is purchasing this year for faculty, staff and labs, with the expectation that they will function well for four years.

All-around excellent, these laptops are versatile, small, and light, with great keyboards, screens, and battery life—the sweet spot for almost everyone.

Mid-tier does not imply mid-range with respect to price. Pricing at this level may vary significantly, especially between manufacturers, from as low as $700 up to $1,500. In general, devices in the $700 - $1,100 range will represent the best value. Devices above that price point will offer enticing features: touchscreens, aluminum chassis, smaller and lighter form factors, as well as higher quality screens.

Once again, we highly recommend the four year Accidental Damage

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<tr>
<th>Baseline Model</th>
<th>CPU:</th>
<th>RAM:</th>
<th>Storage:</th>
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<tbody>
<tr>
<td></td>
<td>Intel Quad Core i5</td>
<td>16GB</td>
<td>256GB SSD*</td>
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<td></td>
<td>Ryzen 5</td>
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<td>512GB SSD*</td>
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<td>Apple M1</td>
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Matching Machines

- Lenovo ThinkPad L14 Gen 1 - 14" - Ryzen 5 Pro 4650U - 16 GB RAM - 512 GB SSD
- Apple MacBook Air with Retina display - 13.3" - M1 - 8 GB RAM - 256 GB SSD

*You should choose hard drive size based on your own expected usage, as hard drives are generally no longer upgradeable. Many people are relying more on cloud storage these days, however that does come with a monthly or annual cost, and overall slower file access.

Economy Model (Lower-Tier)
Our approach to the Economy Model has less to do with specification, and more to do with expected price and longevity.

In today’s market, it’s not easy to distinguish a low-end machine from a mid-range machine in terms of specification or performance. The difference tends to revolve around the processor (e.g. i3 vs i5), memory, and the size or type of hard drive. For our Economy Model recommendation, we have provided a specification that will certainly cost less than those of our Baseline model. We have also offered some other buying options that will likely have a greater impact on the overall cost of the machine.

Offering good bang for your buck, these laptops usually include the same CPU and RAM options as ultrabooks but come in a physically larger size, with a lower-resolution screen, a slower hard drive, a bulkier chassis, and worse battery life. Prices will generally range from $450 to $650.

### Economy Model

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<tr>
<td>Intel Quad Core i5</td>
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<tr>
<td>Apple M1</td>
<td></td>
<td>256GB SSD (lighter use of cloud storage)</td>
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</table>

### Matching Machines

- Microsoft Surface Laptop 3 - 13.5” - Core i5 1035G7 - 8 GB RAM - 128 GB SSD
- Apple MacBook Air with Retina display - 13.3” - M1 - 8 GB RAM - 256 GB SSD

You may notice that the Apple MacBook Air M1 is included in both the Mid and Low tier options. The price point on this machine is a little higher than true economy, but it is the lowest entry point for Apple hardware, and the new M1 chip offers remarkable performance for the price.

### Purchasing Options

**Refurbished Computers**

Most computer manufacturers offer refurbished models at a significantly reduced price, often with full warranties. These machines tend to be a year or two old, so the specifications may be a little lower but not so low as to take them out of the running.

Apple offers a link to “Refurbished and Clearance” equipment at the bottom of their main Store page.

Both Dell and Lenovo have “Outlet” stores online.

You may also be able to find refurbished equipment at your local computer retail or repair store.

**On Sale This Week!**

Most electronics retail stores offer weekly or monthly deals featuring extremely affordable computers. These machines will typically be lower spec and, quite likely, manufactured with cheaper, “consumer grade” components. Such machines might not last as long or perform quite as well as a better-built machine, but often mean spending just a few hundred dollars versus perhaps over a thousand. Even if you find yourself having to buy a replacement machine part way through your college career, it may still prove more economical. And some such machines, when well cared for, will last four years and never experience any problems.

**Consumer vs Enterprise Grade**

ITS tends to recommend enterprise grade (often listed as small business) equipment because, in our experience, it tends to be built with higher quality components and is, as a result, more robust. With that said, many students on campus purchase consumer line machines which perform flawlessly during their Carleton careers.

Consumer line machines tend to be less expensive because the manufacturing process uses less expensive parts. One way in which manufacturers manage this is by sourcing parts from multiple providers across the same manufacturing run. (The only time that this specifically impacts the owner of the machine is if/when they have to upgrade hardware drivers, at which time it can be tricky to identify the specific hardware installed in the machine.)

### High-End (Higher-Tier)
In past years, we included a high-end specification to finish out our three tiers. However, processor speeds have crept up across the board, to the point where even our mid-tier choices can be considered more power than is needed by many people. RAM in higher amounts than 16GB is really only necessary if you will be running high-impact software (such as large statistical analysis packages, or multi-media editing). And hard drive size and type depend largely on how much data, and of what type, you will be storing locally on your machine versus online in the cloud.

If you are looking for a more powerful machine than we have specified above, it's likely that you will know and understand better than us where your own needs lie, whether that's raw processing power, more RAM for multi-tasking, or sheer volume of disk space. This is the type of machine that will be favored by, for example, digital artists working with multimedia (in particular video production), and die-hard gamers. We could try to provide a spec, but the differing needs of high-end computer users vary so much according to function, that it would be harder to pick one direction and call it good for all. A digital artist will likely want faster processor and more RAM. A gamer will be focused on the graphics card, and may want to consider multiple hard drives (an SSD for the operating system, and an HDD with greater storage for game data).

In a college environment, the high-end user is also the most likely to consider a desktop system over a laptop. While we've seen specifications in the two arenas converge during the last few years, it still holds true that the biggest performance upgrades at the best prices lie in the desktop world. Windows desktops also continue to offer the ability to upgrade individual components, increasing the overall longevity of the device.

If you would like advice or suggestions on a high-performance machine, please feel free to contact the ITS Helpdesk online at go.carleton.edu/helpdesk, or by phone at 507-222-5999 and we'll be happy to talk over some options with you.

### Additional Considerations

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<th>Operating System or Mac vs Windows</th>
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<td>We have found that Chromebooks don't provide enough functionality or options to meet all the needs of a four year career at Carleton. While they can easily be used to check Moodle, email, chat sessions, etc. they are not always suited for curricular work. Chromebooks are incompatible with a lot of software packages commonly used on campus, such as Office, the stats suite R, or Mathematica. Chromebooks can connect to the wireless and wired networks, as well as print to Carleton printers. However, depending on the classes that you take in any given term, you should expect to make liberal use of the public campus labs work.</td>
<td>Tablets are the pinnacle of portability. Unfortunately, those running iOS or Android operating system cannot install much of the software used in the Carleton curriculum (Microsoft Office Suite, Rstudio, etc.). Windows tablets circumvent these issues, but often at the cost of performance and disk space on low-cost models, or price on the higher-performance models. Wirecutter has a great breakdown of tablets in their article Can an iPad Pro or Surface Pro Tablet Replace Your Laptop?</td>
<td>A small minority of students on campus own and utilize personal desktop machines. The vast majority of these students build and maintain these machines themselves, and they often use a laptop in addition for most of their academic needs. They are particularly knowledgeable about the unique benefits of these setups and the specs required for their use cases. ITS does not recommend desktop computers for the majority of students, but we are happy to answer questions in a case by case basis over the phone or via email.</td>
<td>Despite the often vocal supporters in each camp, neither operating system is superior to the other; they are simply different. It’s really a matter of personal preference. However, if there is particular software that you (want to) use heavily, and it is only available for one of the operating systems, that may make the decision for you.</td>
<td>The size of the screen is really what governs the overall size (and most of the weight) of a laptop. The importance of screen size is related perhaps most importantly to your vision. There has been a definite trend towards smaller screen sizes in laptops in recent years. Smaller screens with higher resolutions often means smaller text on the screen, which can be a problem if poor eyesight is a consideration (While you can change the resolution settings on laptops, the picture is far superior when running in the native resolution i.e. the default). Another consideration is the type of work you will be doing on the laptop and the amount of “real estate” you want on your desktop. For example, if you prefer to work with multiple windows open and visible, a larger screen will be more important.</td>
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For more information, please consult the What is a Chromebook section from this fantastic article by **Wirecutter: The Best Chromebook**.
Physical Size (Laptops)

If you plan to carry your machine with you most places, it will be worth considering the size and weight of the laptop. Overall, the average weight of laptops has decreased over the years, however a larger screen or more powerful laptop can add a significant few pounds to your backpack.

Graphics: Discrete vs. Integrated

You will see references to "integrated" or "on-board" graphics versus "discrete" graphics when you look at machine listings, but what's the difference? And why is a discrete graphics processor better?

The primary disadvantage of an integrated graphics card is that it does not have its own resources (processor and memory) for performing graphics tasks. Instead, it taps into the main system resources, which reduces the amount available to other processes or programs. The more intense the graphics, the slower other processes or programs will perform.

A discrete graphics card or chip, on the other hand, has its own processor and memory and handles all of the graphics work itself. This means that graphics processes are far less likely to adversely affect the performance of the machine. In fact, overall performance should be better.

Current integrated graphics are vastly superior to those of the past and may be adequate for many people. However, the graphics (or visual) demands placed on personal computers is only going to increase, so more machines are offering the option of an upgrade to a discrete chip.

Service Plans

Most computer manufacturers offer a basic service plan with the purchase of a new machine, with an option to upgrade. While it tends to be a fairly pricey upgrade, we typically recommend that you purchase an extended service plan from the manufacturer (not the retailer), especially in the case of a laptop.

Some manufacturers will also offer an insurance plan which covers damage as the result of accidents such as drops or spilled drink. This is the type of damage we see most commonly at the ITS HelpDesk, and may be considered the most likely on a college campus.

A repair to a laptop can and typically does cost hundreds of dollars—for example, replacing the LCD on a laptop normally costs around $300–500 plus labor; this is similarly true for anything that is attached to the main logic board (aka motherboard) such as the power jack or network port. An extended service plan will often pay for itself with a single repair such as this. Based on our experience at the ITS HelpDesk, many laptops will experience some fault or accidental damage over the course of four years, either due to normal wear and tear or due to manufacturing issues. It is also true that laptops have become much harder for individuals to repair themselves in recent years, often requiring working with the manufacturer and perhaps pay higher prices.

With all that said, you can certainly make a decision based on your own experience. If you have owned a computer in the past and have never needed to repair it, and consider your typical usage to be low risk in terms of damage, you may consider it a better option to just pay for a repair if the need arises.

Disclaimer

Please note that we have no arrangements, deals, or kick-backs with any of the manufacturers included in our matching machines above. Once we had decided on our specifications for each category, we simply checked the manufacturer's websites and selected those models that matched our numbers.

In the interests of disclosure, the bulk of Carleton's computers are purchased from Apple, Dell, Lenovo, and Microsoft, through our vendor CDW-G. Apple offers no special discount for members of the Carleton community, but rather offers a standard Educational Discount to any customers who qualify. Both Dell and Lenovo have, in the past, worked with Carleton to offer computer packages matching our baseline specification at a reduced price, but no such arrangement exists at the time of publishing these recommendations. The Computer Purchasing Portal offered through CDW-G does, however, offer the same discount that Carleton receives on our equipment orders.