Computer Recommendations for CDM Programs

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School of Computing

A laptop is highly recommended for students who are on campus or travel to campus. Battery life is important because outlets may not be reachable in classrooms. Laptops with USB-C charging are ideal because they can be recharged from portable battery packs.

We do recommend systems with:

- Memory: at least 12GB RAM; 16GB RAM is recommended.
- Storage: at least 512GB.

Display size is a personal preference. An external monitor may be useful at home to view more information on the screen.

General Computing Degrees

- BS Computer Science - Software Development concentration
- BA Computing
- BS Information Systems
- BS Information Technology
- BS Math and Computer Science
- MS Computer Science
- MS Business Information Technology
- JD/MS Computer Science Technology
- MS Human-Computer Interaction
- MS Information Systems
- MS Software Engineering -Software Development and Architecture concentration

Many courses in these degree programs do not have special requirements regarding hardware or operating systems (Windows, Linux, or Mac). However, most degree programs allow courses to be taken in areas such as artificial intelligence, cybersecurity, data science, game programming, real-time systems, and robotics. Courses in these areas have additional requirements shown below.

Artificial Intelligence and Data Science

- BS Computer Science - Artificial Intelligence concentration
- BS Data Science
- MS Artificial Intelligence
- MS Data Science
- MS Health Informatics
- MS Software Engineering - Artificial Intelligence in Software Engineering concentration

Data Science can involve significant quantities of data, so:

- A faster processor is required (Intel Core i7 is recommended, AMD Ryzen 5 or better, Apple M1 or better).
- Storage: at least 512GB.

Artificial intelligence tasks can use GPUs to accelerate certain tasks, so:

- A GPU is highly recommended. Nvidia GPUs are the most compatible. GPUs in recent Apple Macs are fast but not as compatible with as much software.
- The processor and storage requirement/recommendation for data science also applies.

Cybersecurity and Network Engineering

- BS Cybersecurity
- BS Network Engineering and Security
- MS Cybersecurity
- MS Network Engineering and Security

These degree programs require:

o   Windows as the host operating system (dual booting is acceptable; running Windows in a VM will not suffice).
o   A processor with 4+ cores and virtualization support (Intel VTx or AMD-V). Intel is preferred over AMD for official support with some software.
o   16GB of RAM.

In particular, Macs with Apple silicon (M1, M2, M3, etc.) cannot be used for these degree programs.

Game Programming and Real-Time Systems

o   BS Computer Science - Game Systems concentration
o   BS Game Programming
o   MS Game Programming
o   MS Software Engineering (Real-Time Software and Game Systems concentration)

These degree programs require:

o   Windows as the host operating system (dual booting is acceptable; running Windows in a VM will not suffice).
o   Faster processors (Intel i7 or better, AMD Ryzen 7 or better) with 8+ cores.
o   16GB of RAM.
o   An Nvidia GPU is strongly recommended over ATI/Intel GPUs.

In particular, Macs cannot be used for these degree programs.

Intelligent Systems Engineering and Robotics

- BS Intelligent Systems Engineering
- BS Robotics

These degree programs require:

- Windows as the host operating system (dual booting is acceptable; running Windows in a VM will not suffice).

School of Design

Graphic Design

MacBook Air or better laptop (or comparable Windows laptop). Mac is the preferred platform as it is the standard in the industry—and it's what your professors will be familiar with—but a Windows machine is equally capable. If you use a Windows-based laptop, it should be running Windows 10 or higher. You'll want at least 500 GB of storage on an SSD disk. 16 GB (or more) of RAM would be ideal, but 8 GB is okay if you're not working with video or 3D modeling.

A 15" laptop screen is necessary if you plan on spending any amount of time working as a designer on your laptop. It would be a good idea to invest in an external monitor as well. While it's difficult to beat the technical specifications of Mac's Studio Display, other brands like LG and Dell make 24–27" monitors that are sufficient in quality at a fraction of the price.

Please do not expect to be able to use a tablet. While Adobe ships mobile versions of some of its applications, these are not the same as the desktop versions and lack many necessary features.

Cloud storage for storing project files. Be aware that DePaul provides access to Adobe Creative Cloud while you're enrolled in courses that require its use (which includes most of your graphic design coursework)—but this access does not extend through breaks between quarters.

User Experience Design

We do not have a specific recommendation in terms of a suggested personal computer, however having a laptop computer will be more useful than a desktop machine. Either a PC or a Mac would work for most situations in the UXD program—most software you'll use (e.g. Adobe products, prototyping software) work on both systems or have a cloud-based version.

Game Design

A laptop or desktop running Windows (7 or higher, 64-bit) is preferred to allow students to work easily across all range of game development environments, though Windows 10 (64-bit) is recommended. We recommend a 2.5 Ghz processor, 8 GB Ram, and a discrete video card with DirectX 11 support and at least 2GB of RAM. Alternatively, a MacBook Pro has its benefits, as it can run both Windows and Mac operating systems as well as be used for iPhone game development. Regardless of your operating system, you'll want to avoid systems that use integrated Intel graphics as their main graphics chipset, as they just don't hold up when you begin to work on more complicated uses of most commercial game engines.

Industrial Design

For industrial designers, Windows is the hardware standard for several reasons:

- Rhino will be taught using the Windows version, plus more functionality-extending plugins are available on the Windows platform.
- SolidWorks is Windows-only and will only run on Mac when dual-booted into Windows using Parallels, a sizable performance compromise.
- Keyshot is running on a Mac sacrifices GPU rendering—plus, Macs are incompatible with RTX-class GPUs.

Although Macs are capable machines, for Industrial Designers, Windows provides better performance and more flexibility for less money.

Graphics Processing Unit—A dedicated graphic processor improves performance over integrated graphics. An independent GPU facilitates accelerated rendering (including textures, shading, and lighting) and smoother motion at higher resolutions. Adobe, Rhino, Keyshot, and Solidworks highly recommend it.

Display—You'll need every millimeter of a 15" screen, but don't spend more for 4K resolution, 142% color gamut score, touch screen, or OLED technology. Instead, buy a 27-32" external display for your room. Your eyes will thank you - 3D CAD eats up almost as much space as the foam prototypes in your closet.

Capable Laptop Specifications for Industrial Design

CPU: i7 64-bit Intel processor with 8-16 Cores or higher and support for SSE4.2 or higher
OS: Windows 10 or 11 (64-bit)
GPU: Nvidia GeForce RTX 30xx to 40xx or higher, 8 GB VRAM or higher, DirectX 12 support
RAM: 16 - 32 GB
SSD: 500 MB - 1 TB

Acronym Reveal:

CPU –Central Processing Unit   **RAM** –Random Access Memory
OS –Operating System   **SSD** –Solid State Drive
GPU –Graphics Processing Unit

Digital Sketching Options**:**

- Apple iPad Pro
- Samsung S9
- Wacom Intuos or Cintiq
- Xencelabs Pen Tablet Medium

School of Cinematic Arts

Film and Television

Hardware: Mac or PC laptop or workstation.

*Laptop Display***:** 1080p (1920x1080) or 1440p (2560x1440) is recommended for laptop machines. Larger screen size is more important than resolution.

*RAM***:** 16GB minimum, but 32GB is highly recommended, especially for Editing and Visual Effects courses.

Desktop Graphics Card: 4GB onboard memory minimum. If looking to build or buy a desktop system, an NVIDIA GTX 1660Ti is the minimum requirement, and an RTX 2060/2060 SUPER or better card is recommended. AMD Radeon 5700 XT or better will also work, but NVIDIA is preferred for its proprietary encoding solutions (NVENC).

*Laptop Internal Storage***:** An SSD for the base OS and a hard drive or additional SSD for extra storage capacity. 1TB is the recommended minimum, however, more is preferable.

*Desktop Internal Storage***:** 500GB SSD (M.2 nvME OR 2.5") & 1TB Hard Drive are recommended minimum. More storage is better; opting for a larger hard drive vs a larger SSD is the most cost-effective.

*Ports***:** Thunderbolt 3, USB-C, USB 3.0, and Ethernet (for networking) are all recommended. If using a laptop, USB hubs are a recommended accessory to expand connectivity. The reference photo below indicates the labeling used to distinguish Thunderbolt from USB C.

Thunderbolt 3 40Gb/s   USB 3.1 Gen 2 10Gb/s
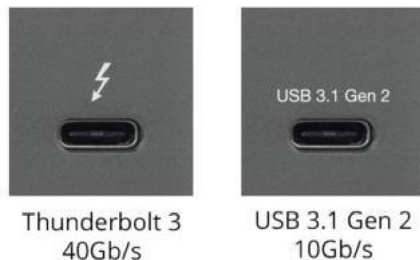
External Hard Drive: 2TB or more with Thunderbolt 3 or USB-C connectivity. After purchasing, the drive should be formatted to exFAT so it can be used with both PC and MAC workstations.

Hardware Discounts

Students are eligible for [hardware discounts](#) from preferred vendors.

Animation

The animation program recommends that students wait until after their first year to determine if they need their own computer. This will give them time to figure out what their interests are in animation which will in turn dictate what setup best fits their needs.

Priority Specifications
- The most powerful processor possible, for Intel and AMD CPUs, i7/i9 and Ryzen 7/Ryzen 9

should be preferred over 3 or 5 series processors, even if the latter are newer.
- A discrete graphics card from either AMD or NVIDIA is recommended. The more *video memory* (GDDR5+) the better.
- The main drive, containing the OS, should be an SSD, with a secondary, larger HDD drive for storage.
- Much like the rest of the School of Cinematic Arts, a larger display will be useful. If buying a laptop, a physically larger screen takes precedent over a higher resolution screen. 1080p or 1440p is the highest necessary resolution, 4K is more demanding on the machine and detracts from performance.
- If looking to do drawing, consider a machine with pen input support, or buying a separate drawing tablet to use with the machine.

Mac or PC
The animation program is designed for *either* platform to be used. The animation labs on campus are predominantly PC based. The software that students will use in class is available for either platform. Students focused on 3D Animation will likely benefit more from a PC based system as it is native to most 3D software and hardware.

Software Recommendations
Our labs are loaded with all software our students are required to use for class. If students wish to purchase copies for their own computer they should consider the following:
- Adobe Creative Cloud (CC): Available as a month to month purchase. Photoshop, After Effects, Premiere, Animator, are the most commonly used applications. Students interested in motion graphics may also want to get Adobe Illustrator. These are available as part of a suite or for individual purchase. Information about [software downloads and discount offers can be found here](#).
- Autodesk Suite: This is essential software for all 3D animators. It includes a full range of Autodesk products including Maya, Max, Mudbox, and Motionbuilder. It is available as a free download for current students at https://www.autodesk.com/education/free-software/featured.
- TV Paint: Excellent and versatile software for 2D animators.

Hardware Discounts
Students are eligible for [hardware discounts](#) from preferred vendors.