

Laptop Requirements for Visualization students

The Department of Visualization **requires** that all incoming students (Freshmen, Change of Majors, Transfer Students and Graduate Students) have a serviceable laptop computer and suggests the following minimum system configuration. Because the requirements for a useful system vary from program to program, these suggestions supersede College requirements and apply only to students in Visualization degree programs. It is important to note that no student will be denied admission to the College because of an inability to provide a laptop.

Background

As in most programs, computing requirements are uneven, based on the course and the individual instructor. In Visualization, the most computational intensive applications are rendering, video editing, programming and real-time interaction. Of these, rendering (creating visual images from 3D models) is the most resource intensive. It is not unusual for projects to require several days of computing to create an animation of 30 seconds. In some classes, in excess of 20 hours may be required to render a final image. Coupled with the requirement to produce intermediate animations/images for review and critique, it is easy to see that the fastest affordable systems can be insufficient to meet demand. However, students can – and do – find moderately priced systems that, with careful planning and judicious use of resources, are sufficient to meet program demands.

As previously mentioned, not all classes require a high level of computing power, so it is helpful to understand when those courses occur in the curriculum. Looking at the four major application areas, the chart below indicates when those resources will be most in demand.

	RENDERING	VIDEO & 2D	PROGRAMING	INTERACTIVE
FRESHMAN	Light	Light	Light	Light
SOPHOMORE	Moderate	Moderate	Moderate	Light
JUNIOR	Heavy	(Moderate)	(Moderate)	(Moderate)
SENIOR	(Heavy)	(Heavy)	(Heavy)	(Heavy)

GRAD STUDENT	(Heavy)	(Heavy)	(Heavy)	(Heavy)
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Note: parentheses indicates that requirements are variable depending on student interests and elective classes.

“Light” demands can be accomplished with very moderate resources. A functional laptop even 3 or 4 years old will be sufficient for the first year in the program. In the second year of the program and beyond, usage increases substantially. As technology progresses, we certainly expect that similar equipment purchased next year will either be more capable, cheaper or a combination. A laptop purchased next year will most certainly be a better value than one purchased today. For that reason, if you have a usable laptop for the first year of the undergraduate program, we recommend delaying a major laptop purchase until the beginning of the second year. As the useful life expectancy of a computer system is 3 years, this approach will provide the highest level of computing resources during the time of greatest need. Graduate Students will be expected to enter their program with a laptop capable of higher performance.

Remember, the major advantage of a laptop is its portability, not its computational power. A number of students maintain a separate, more powerful desktop system for use outside the classroom environment.

Hardware Requirements

PC or Mac? Both platforms are used in the program. The division is not very clear as representative software is available for both platforms. Both platforms have advantages and disadvantages, so the choice is more a matter of personal preference than programmatic requirements. Students will have the opportunity to use both platforms in the program. Additionally, the LINUX operating system is used for the programming classes and some computing and animation electives. In the PC environment, the easiest way to gain access to LINUX is through the installation of a “virtual appliance” which allows LINUX to be installed and appear as a regular application to the host operating system. With the Mac, the native operating system is very similar to LINUX and can be used for programming courses.

Listed below are requirements that should be met by either platform.

1. a 6-core i7 processor minimum (this will change as processors develop in performance)
2. approximately 3 GB of memory per core (16GB of RAM minimum)
3. a 512GB hard drive (minimum)
4. a discrete graphics card, not an imbedded graphics chip on motherboard (Nvidia graphics recommended for future software which includes GPU rendering capability but not a firm requirement as ATI graphic chips have a similar but incompatible functionality)

Note: as much memory, graphics card performance and hard drive as you can afford, above the minimums listed above, will be a benefit. Increased memory and graphics performance is more important than exceeding the minimum spec on CPU.

5. minimum screen size of 13"
6. on-board camera
7. external 3 button mouse
8. wi-fi
9. a 32GB USB flash drive

There are several external devices that are useful at various times throughout the program. These are not required, but increase productivity. Graphic design classes, digital painting, digital sculpting, 3D surfacing and related classes frequently use a **Wacom-style tablet** as an input device which allows pressure sensitive input. These courses are generally taken during the 3rd and 4th years in the program but may occur during the second year for change of majors and transfer students. A **500GB external USB hard drive** is very useful for backup and to transfer large volumes of data between personal and University machines. External drives that are usb powered are more convenient and flexible than drives that require an external power source. This requirement will be more prevalent in the 3rd and 4th years of the program. Depending on the type of connector on the laptop for external display, an **HDMI adapter** may be very useful.

If the laptop is the primary system, there are additional devices that can make the system more productive. An **external keyboard** and **full sized monitor** actually increase the speed with which the system can be used. A **spare battery** can be useful, however, all the studios are now provided with power drops.

Software Requirements

It is completely possible to complete the undergraduate program using only open source software. However, students may choose to use industry standard commercial software based on personal preference. Many software providers have free, or low cost, options for students. Consider waiting until the need exists so that the latest version of the software can be obtained. Your computer will be the workhorse during your professional career. Consider getting comfortable with investing in licensed software for your personal machine, much as you would purchase textbooks.

Existing Departmental Resources

The Department maintains laboratories used for both teaching and general access outside of class hours. These labs contain Mac, Windows and LINUX systems with software used in the various courses and are available after hours on a first come-first served basis. A variety of printers, scanners and other input/output devices located throughout the Department and College are available to the student.