UF|SOA Student Computing Requirement

All students must have serviceable computers and software for use in studio. While CIRCA is available to meet most computing needs, downtime or issues with software/licenses may restrict your capability to produce during peak production times. Having your own computer will allow you to be more flexible and fluid with your incorporation of digital media into the design workflow. Windows laptops are highly recommended, as most AEC (Architecture / Engineering / Construction) software is Windows only and do not have viable Mac counterparts. You will also need a webcam (usually built-in to the laptop) and a mouse (trackpads will not work for drafting/modeling programs).

UF|SOA Minimum Laptop Hardware Specifications

LAPTOPS [Updated for 2024 Q3]

Component/Subsystem	Recommended Specs
CPU [3.2 GHz or higher]	AMD Ryzen 7 or 9 Series: Ex: [R9 8945HS] [R7 8845HS] [R7 7745HX] Or Intel Core i7. i9 H,K,F Series Ex: [i7-12700K] [i9-13900HX] [i7-13620H]
Processor Cores	Hex/Octa Core (6-8 physical, 12-16 logical)
Graphics Card	Discrete graphics card (dGPU) with RTX raytracing, 6-8 GB of dedicated video ram (VRAM). Ex: [Nvidia GeForce RTX 3060] or [Nvidia GeForce RTX 4060] [Nvidia GeForce RTX 3070Ti] or [Nvidia GeForce RTX 4070]
RAM	16GB or higher
Storage SSD: Solid State Drive HDD: Hard Disk Drive	500GB SSD + 2TB USB 3.0 external storage HDD + [WD My Passport, Seagate Backup Plus] Cloud File Storage [Dropbox, OneDrive, GDrive]
Screen Size / Resolution	14" or larger / 1920 x 1080 or higher [A 24-27" desktop monitor can be helpful as a second screen]
Connectivity	802.11ax Wi-Fi 6E, Bluetooth 5.1
Operating System	Windows 10/11 64 Bit
Input	3-button mouse with scroll wheel
Budget (Q3 2024)	$900 - $1800 USD
Example Product Series (Q3 2024)	Dell G15, Dell G16, Dell XPS15 Alienware m16 R2, Alienware x14 R2 Asus ROG Zephyrus G14, Asus ROG Zephyrus G16 [Recommended] Asus ROG Strix G16, ASUS TUF Gaming F15 HP Omen 14, HP Omen 16 Acer Predator Helios Neo 14 or 16 MSI Katana 15, MSI Stealth 14, MSI Cyborg 14 Lenovo Legion Pro 5i, Lenovo Legion Slim 5 Razer Blade 15

Summary: Mid-range gaming laptop, $1200-$2000. Sometimes can be found for $8-900 when on sale.

CPU: AMD Ryzen 7/9 or Intel Core i7/i9

RAM: 16GB or above

Graphics: Nvidia GeForce RTX 3060/4060 or above

Storage: 512 GB SSD or above

Purchasing Notes [Updated for 2024 Q3]

CPU Choice:

- Rendering performance depends on CPU clock speed (GHz) and number of cores (4,6,8, etc…). Generally, the higher number of both means faster, although rendering is well optimized for multi-threading therefore more cores has a larger impact than clock speed.
- **Intel vs AMD:** Currently, AMD laptop processors offer much better power/performance ratio; therefore **AMD CPUs are more recommended**. That being said, recent 12th/13th generation Intel CPUs can compete on performance, but not power efficiency, so they will typically run hotter and run out of power faster.
- **AMD:** The Ryzen 7 or 9 series CPUs are performance-oriented, usually with 8-16 full cores and double the amount of logical cores/threads. Ex: Ryzen 9 8945HS, Ryzen 7 8845HS. Even 1-2 generations older are still very competitive (Ryzen 9 6900HS, Ryzen 9 5980HS).
- **Intel**: To find a true performance-oriented CPU with 4-8 Performance cores, usually these will come with the H, K, or F suffixes (i7-12700K, i9-13900HX). These CPUs will also have 6-12 Efficiency cores for low-power calculations, so they are branded as having 12-20 cores, but it is not equivalent to AMD's full core counts.
- As part of Intel's intentionally confusing branding strategy, there are many low-medium cost laptops with ultra-low voltage mobility CPUs, designated with the U, UL, or E, suffixes (i5-1345UE, i7-1250U). While generally great for battery life and portability, these are underpowered for more intensive tasks like rendering and heavy Photoshop workloads.

Graphics Cards:

- Graphics cards impact the speed and smoothness of your 3D program display (ex: Rhino viewport refresh rate). Additionally, real-time render engines such as Lumion/Enscape/Twinmotion will require a powerful discrete graphics card with 6-8 GB of video memory (VRAM).
- **dGPU:** You want a laptop with a **discrete graphics card**, like the Nvidia GeForce RTX series that has dedicated memory, typically found in "gaming laptops". Look for a GeForce RTX 3060/4060 or higher.
- Nvidia generally has better driver support and is more stable than the AMD Radeon series for our applications, so we will not recommend any laptops with Radeon series graphics cards.
- **iGPU:** Most thin and light laptops come with "integrated" Intel UHD/Iris Xe Graphics, or AMD Radeon RX Graphics for Laptops. These graphics processors are embedded within the CPU but share system memory (which is slower) for texture application. These are passable early on, perhaps for years 1-2 but will struggle with heavier and more complex models later.

Storage: SSD vs HDD vs Cloud

- The single component that can speed up the user experience greatly is the Solid State Drive (SSD). While much more expensive per GB than traditional mechanical platter-based Hard Disk Drives (HDD), they are much faster and much less prone to failure due to lack of moving parts.
- SSDs come in smaller capacities (512GB, 1TB) so the ideal situation is to install all your frequently used programs (Windows OS, applications) on the SSD for speed, and have a larger 2TB+ external USB 3.0 HDD for storage of media and data that are accessed less frequently (older project files, photos, music, etc…).
- Mission critical files should have redundant backups and stored simultaneously to a cloud-based file service such as Dropbox or OneDrive (5TB) as provided by the university: https://it.ufl.edu/services/gatorcloud-onedrive-uf

Mac Users

- Macs are <u>not recommended</u> due to lack of software support, higher price, and the need to dual-boot or emulate to access some of the necessary software.
- The MacBook Air will be underpowered and is not suitable. The best Mac choice is an upgraded 14" or 16" MBP with Apple M3 Pro or M3 Max chip but will cost close to $3000, and compatibility with some programs is not always guaranteed.
- Many of the applications required in architecture are Windows exclusive, therefore Mac users are required to dual-boot using Bootcamp or Parallels and an installation of Windows 10/11. Bootcamp comes with Mac OS, but you will need to purchase a Windows license. At the very minimum 300 GB should be allocated for your Windows partition to install and run everything you need.

UF|SOA Software Requirements

You will be required to purchase software and specific software will be listed on each course syllabus. Plan on budgeting $300-$500 per year for software. Most software will also be available at the CIRCA Architecture computer labs in ARC 116, 118, 120. (https://labs.at.ufl.edu/computer-labs/architecture/)

It is **highly recommended** that your operating system is Windows 10/11 64-bit. Architectural design programs often work with large datasets and benefit greatly from the memory overhead as well as stability that a 64-bit OS provides.

The following is a list of commonly used software and where/how to obtain them for installation on your own personal computers.

Commonly used software:

GatorCloud: Microsoft OneDrive   https://it.ufl.edu/services/gatorcloud-onedrive-uf

   All UF students have access to 5TB of cloud storage via GatorCloud. This is the safest way to backup data/work.

Microsoft Office Suite: Word | PowerPoint   http://www.it.ufl.edu/gatorcloud/free-office-365-downloads/

   As part of UF's campus-wide licensing agreement, the Microsoft Office 365 program allows multiple full downloads of Microsoft Office to personal computers and mobile devices at no charge.

Autodesk: AutoCAD Architecture | Revit Architecture | Revit Structures | Green Building Studio

   http://www.autodesk.com/education/free-software/all

Adobe CC: Photoshop | Illustrator | InDesign | Acrobat https://www.adobe.com/creativecloud/buy/education.html

   Alternatively, students may consider using UF Apps (https://info.apps.ufl.edu/), which is a "streaming" option available for a variety of applications, listed on the UF Apps website. However, please note that this requires a fast internet connection to use reliably, and user customization preferences are not retained between sessions.

McNeel Rhinoceros 8.0:   https://www.rhino3d.com/sales/north-america/United_States

   Academic License Windows Version $195. Please note the Mac version is not fully-featured and will not work for our purposes. **UF has a special licensing agreement with McNeel Miami** and **Educational Licenses are offered at a discount rate of $95** at this link: https://mcneelmiami.com/inc/sdetail/23049

Chaos Group: **V-Ray for Rhino**   https://www.chaosgroup.com/education/academic

Lumion Student https://lumion.com/product/educational-licenses

  Free for students with status verification. Note that Lumion will require a powerful graphics card in order to run.