School of Design Laptop Requirement for New Majors Industrial Design (BSID) Fall 2024

The School of Design requires that each incoming Design student own a laptop with performance suitable for the work they will be expected to do, and that they be prepared to purchase certain software programs and accessories required by their courses.

You should budget for the purchase of the necessary hardware and software the same way you would books and other supplies for class. Educational purchase discounts for both hardware and software are offered by the SFSU Campus Store and by many online vendors. Most of the software you need will be provided to you for free as long as you are a student.

You will begin using demanding graphics applications by your junior year (or your first semester in the program as a transfer student), so it is important that you have a laptop capable of running these programs well by that time. Below are details of the hardware and software requirements for all BSID students.

Hardware — Laptops for BSID Majors

The most performance-demanding applications used in the BSID program are 3D modeling and rendering applications — SolidWorks, Rhinoceros 3D, KeyShot, and Fusion 360 — so these set the basic hardware requirements. SolidWorks only runs in Windows and Rhino is primarily developed for Windows, so at this point a Windows PC laptop is recommended for all students in the BSID program. In general, good quality PC laptops are available from Dell, Lenovo and HP. Following the specifications below, you should expect to spend $1500-$2500 on a laptop that should last you several years.

*Note: Please do not purchase a Microsoft Surface. This product does not have suitable graphics and rendering performance for the BSID program.

If you have a particular affinity for Macintosh computers, or if you already own a powerful Macintosh laptop, it is possible to use it in the BSID program. Most of the programs you will use are available in versions for Windows or Mac OS. SolidWorks is the one exception, and to run it on a Mac you will need to purchase software called Parallels Desktop ($120 per year) for compatibility. You will also need to have a very powerful computer, i.e. a recent MacBook Pro, for good performance, as the translation from Windows to Mac OS makes SolidWorks run somewhat more slowly in Parallels than it would on a Windows PC.

Hardware — Specifications

- **Operating System:** Windows 10 (64-bit) or Windows 11.
- **Processor:** 10th generation Intel Core i5 or better, 4 or more cores. Later generations, i7 or i9 models, and more cores will all increase performance. Intel processors follow a naming convention where the first two digits are the generation and the remaining digits give the relative performance within that generation. So an i5-11400 is 11th generation and slightly slower than an i5-11500.
- **Memory:** Minimum of 16 GB of RAM for new computers in 2023. 32 GB will give superior performance, especially when running several applications at once. It is worth getting more RAM up front to extend your laptop's useful lifetime, as software tends to become more RAM-hungry in newer versions.
- **Storage:** 512 GB or larger solid-state drive (SSD). SSDs increase performance dramatically over older hard disk drive technology. Some laptops may have both an SSD and a hard disk for additional storage space, but do not purchase a laptop which only has a hard disk.

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- **Graphics:** Intel HD Graphics 620, Iris Xe, or better required. While Intel graphics chips will run the applications, performance will be reduced. An NVIDIA graphics card with at least 4 GB of VRAM (e.g. RTX 3060) will provide significantly better 3D performance.
- **Size/Display:** 15" display with at least 1920 x 1080 resolution. Higher resolution (2560x1440, 4k) will give you more working space. A smaller, lighter (e.g., 13") laptop may be a reasonable choice if you have a large display at home, but can be cramped for graphics use if you only use the built-in display.
- **Mouse**: To use 3D modeling software efficiently, you will need a mouse with at least two main buttons and a center wheel-button. Note that the Apple Magic Mouse, with virtual multi-touch buttons, generally does not work very well for these 3D applications; get one with regular buttons. You can get a wireless mouse or one with a retractable cord for convenience.
- **Backup and Storage**: In the BSID program you will be creating a lot of large files that can quickly fill up your laptop's storage drive — and you certainly don't want to lose all your work should something happen to your laptop. **To help prevent loss of data, all students are required have an online ("cloud") storage/backup that syncs automatically.** As an SFSU student you have a free Box account, accessible at https://sfsu.app.box.com/. This is a safe and secure way to store and back up your work. Other options include Google Drive, Microsoft OneDrive, or iCloud; all sync automatically with your file system and have relatively low fees for the service.

As noted, the School of Design does not currently recommend Macintosh laptops for BSID students. However, if you are committed to using one, most of the above recommendations will still apply, and in general the fastest MacBook Pro you can afford is the best option.

Hardware — Useful Extras

- **External display** for working at home; more workspace and a larger image are always nice to have. You may be able to use a TV for this purpose as well.
- **USB flash drive** for exchanging files with others, loading files onto 3D printers and CNC tools, and presenting work. Note: these are not generally stable enough to serve as backup drives, especially because they tend to bang around on your keychain, get forgotten in the labs, go through the laundry, and so on.
- **External hard disk drive** for backing up your work (in addition to the cloud storage mentioned above). La Cie or Seagate are good brands. Read about the "3-2-1 Backup Strategy" for more information.
- **Spare AC adapter** so you can leave one at home and keep one in your backpack. This is the most frequently seen object in our lost and found.
- **Laptop sleeve** to keep your computer looking nice as it bounces around in your bag.
- **Extended warranty** for your laptop, if available, may be a good idea.
- **Insurance policy coverage** for your laptop may be added to your home or renter's insurance.
- **Laptop security cable** to tether your machine wherever you are working at school, assuming laptop has a Kensington-type security slot. Never leave your laptop unattended! Thefts do sometimes occur, and it takes only a few seconds for someone to peek in a propped-open door and grab a laptop off a table.
- **External battery or power pack** (10000-20000 mAh) for charging laptops and smartphones.

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Software — Basic Productivity Applications

To perform basic tasks like word processing, building simple slideshows, and working with spreadsheets, as an SFSU student you have free access to Microsoft Office: https://its.sfsu.edu/service/office365students. If you like, you may use alternatives like **Apple iWork** or cloud-based software like **Google Docs** instead.

Software — Design Applications

Nearly all of your design classes will require that you use **Adobe Photoshop, Illustrator, InDesign,** and **Acrobat Pro** in various ways. As a student in the School of Design (declared majors and minors only), you have free access to these programs, and all other Adobe applications, through the Adobe Creative Cloud. The process for accessing Adobe software for installation on personally-owned computers is at https://athelp.sfsu.edu/hc/en-us/articles/360034974694-How-to-install-Adobe-applications-on-personal-machines. Use your SFSU credentials to log in, and you should have immediate access to the Creative Cloud programs. The four programs listed above should be installed before you start your first classes in the School of Design.

If you have trouble accessing the software when logging in with your SFSU credentials, please send your name, ID number, and registration status (Major or Minor) to design@sfsu.edu. You can also call 415-405-5555, or email service@sfsu.edu. Please note that SFSU IT support is limited to troubleshooting access to the Adobe software or access to the Adobe Creative Cloud portal. SFSU IT cannot provide support or training for the use of the Adobe software or support student computers themselves.

After you graduate or leave the University, you will lose access to the SFSU Adobe Creative Cloud license. To migrate any content that you have stored on the Adobe Creative Cloud to a personal account, you will need to either download and transfer it manually, or contact service@sfsu.edu for assistance. SFSU IT has indicated that you will have at least a few months post-graduation to deal with this before the access ends.

Software — Industrial Design-Specific Applications

The BSID program requires the use of certain 3D computer-aided design and modeling software in addition to standard 2D applications. The main applications in this category are SolidWorks, Rhinoceros 3D, Keyshot, and Fusion 360, all of which are provided free for BSID students. Make sure your hardware meets the specifications outlined earlier in this document in order to run the software properly.

- **SolidWorks** is used for mechanical modeling and solid product design. This is provided to you through a free educational license that is renewable every year. Your instructor will provide information on how to access this software when you start to use it.
- **Rhinoceros 3D** is used for sculptural surface modeling and advanced form work. This is provided through a floating license server that requires access to the SFSU network. Your instructor will provide information on how to access this software when you start to use it.
- **KeyShot** is used to produce photorealistic 3D renderings. This is provided through a floating license server that requires access to the SFSU network. Your instructor will provide information on how to access this software when you start to use it.

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- **Fusion 360** is used for CNC machining and manufacturing. This is available as a free download from www.autodesk.com when you sign up for a student account with your SFSU credentials.

Software — Additional Applications

Some advanced or special topic courses require additional software which may be made available to students in the course through an educational license, which may be purchased before taking the class, or which is open-source and free. Information about accessing specific programs will be provided in these classes' syllabi.

Where to Purchase Additional Student Priced Software

Make sure that you are obtaining student/educational pricing for any applications that you purchase! Many companies offer student discounts, sometimes as high as 90%. If you have questions, please work with your faculty to ensure you are getting the best price. Two good places to start are https://sfsu.onthehub.com, which has a variety of educational software packages for sale; and http://www.novedge.com/, which is a volume-license reseller that often beats even the companies' own student pricing.

Be ready to provide documentation supporting your student status — this may include your SFSU email address, a picture of your student ID card, or a screenshot of your class schedule.