



# HARDWARE AND SOFTWARE REQUIREMENTS

Computing in Architecture\_ARCH 472\_Fall 2008  
Kansas State University Department of Architecture  
Professor Matthew Knox (revised 21 April 2008)

## INTRODUCTION

The computer is a vital tool in architectural design. It is not a replacement for other tools such as drawing, sketching and material models but acts as part of a system; a system directed toward understanding, conceiving, composing, visualizing and communicating architectural space and elements.

Department of Architecture students entering their third year of study are required to provide a computer workstation capable of running the software used in the Computing in Architecture course and ADS 3+4.

The Computing in Architecture course will provide a basic overview of computer use as part of our architectural education. The objective of the course is to provide students with the essential concepts as a stepping stone toward using the computer in design.

## OPERATING SYSTEMS

The Department of Architecture's overall concern is using the tool best suited for the endeavor at hand. Faculty and students are using Windows-based systems as well as Macintosh systems. This openness is important to our flexibility and the thoughtfulness of our work. However, AutoCAD, Viz, 3ds Max and Revit software are only on Windows. This has become less of an issue as Macintosh systems are now running Intel based chips and through a program called Boot Camp can run Windows. I have been running the course software in XP Pro and Vista Ultimate on a MacBook Pro and a Mac Pro without any serious problems. For now I recommend running Windows on the Mac under Boot Camp instead of emulation software such as Parallels as the full resources of the machine are devoted to Windows.

All computers must be running one of the following:

Windows Vista Business

Windows Vista Ultimate

WindowsXP Professional (XP support will be discontinued after the 2008-2009 academic year)

Mac OS 10.5 Leopard

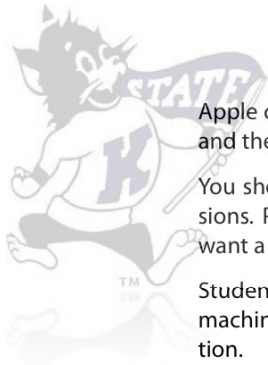
## HARDWARE OVERVIEW

There are many important issues to consider in selection of a workstation or notebook. Foremost is getting a machine that will grow with your skills and ambitions. You must consider a "three-year window" covering the third, fourth and fifth year of your education. The things you will be doing in third year are just a start and by your fifth year you may be doing something more hardware intensive. If your machine is robust now and/or has the ability to expand and change your initial investment will make more sense. Secondly, quality is important. You will be doing professional level work on your machine requiring high-quality components. Consumer level computers designed for home use, while less expensive in most cases are unsuitable.

## PURCHASING

I recommend you purchase a machine from Dell or Apple. Each of these companies offers computers that have been above average in reliability and service and have represented the most common choice for our students. Each of these companies offers educational discounts.

Dell offers a ready to go system that will meet the needs of the course. Apple offers an education store to purchase a computer at an educational discount. Visit the College CNS web page at <http://capd.ksu.edu/cns/purchasing-a-pc> for links and specifications. If you are purchasing an



Apple computer you can also visit the Union Computer Store. The Apple MacBook Pro, Mac Pro and the iMac will run the necessary software for the class.

You should not order your machine until later in June or early July to get the most recent versions. Please check the above site for any course or computer news over the summer. If you want a more customized machine you will have to contact Dell or Apple yourself.

Students must be actively involved in purchasing a machine. You will be the manager of that machine and need to know as much as possible. This is part of your computer literacy education.

I would love to be able to help you choose exactly what to get in all instances but I just don't have the time to research all of the possibilities or research a product for you. There are many web sites reviewing computer products so please take advantage of them. I am happy to answer questions from students only on general issues. Questions about a particular computer should be directed to the manufacture.

The manufactures listed here are completely optional for you to use and the specifications listed can be met by many other manufactures. I cannot in anyway control the systems, quality and service they offer. I have no control over the production and shipping schedules of Dell or Apple so you will need to work with them on scheduling your order to ensure that your machine is here the first week of classes.

Warning: If you are contemplating a custom machine make sure that it is set up for high-end 3D modeling, rendering and animation work using programs like AutoDesk 3ds Max and Maya. If you, or whomever, is putting it together is not experienced and confident in assembling and setting up a high-end graphics workstation then you are much better off buying a complete unit. Ultimately you are responsible for the computer you provide for use in the academic environment.

### **NOTEBOOKS**

There are some very powerful notebooks that will run the software we use. The ability to upgrade is more limited but many students choose this route. A notebook can be used for study abroad, etc. If you do get a notebook, I don't recommend the 17-inch or larger models because they are very difficult to travel with. Instead, I would get a 15-inch model and purchase a larger monitor to connect with in studio.

### **WHICH ONE?**

If you cannot decide to get a PC or a Mac I personally would go with a Mac because there are some really nice multimedia programs that are Mac only such as Final Cut Pro Studio that you may want to use at some time and you can run Windows on the machine when you need a Windows only program. I like the flexibility. The Mac may appear to be more costly initially but I think the quality, integration of the components, support and user experience justify the cost. The most flexible option is probably a MacBook Pro 15-inch with an external monitor along with an external keyboard and mouse. The Mac Pro with two quad core Intel Zeon processors is amazingly fast using the Mac OS and running Windows if you want to go all out.

On the other hand, I have had five Dell computers and have been very pleased with the quality and support so I don't think you can go wrong with a Dell PC.

### **HARDWARE DESCRIPTIONS**

Listed below are hardware descriptions for a system with flexibility for the "three-year window." See the CNS website for more information. <http://capd.ksu.edu/cns/purchasing-a-pc>

**Monitor:** 19 inches + Flat Screen.

Getting a good monitor is extremely important. You will be looking at your screen for many hours and a low quality screen will lead to fatigue. The minimum resolution you should consider is 1280 x 1020. Pixel resolutions around 1600 x 1000 or 1900 x 1200 are optimal.



Dual monitors are an advantage but two larger monitors most likely will not fit in your box. A 20 to 24-inch monitor would be an excellent choice. These can be rather expensive but a good one is worth the extra cost (I have experience with 23-24" Dell and Apple monitors and each works very well with the programs we are using. A widescreen format is recommended as it is the trend and it makes working on documents easier.

**Processor:** 2.4 GHz Intel Dual Core 2 Duo or Xeon Quad Core or equivalent.

The processor chip is responsible for doing the calculations. In most cases the faster it is rated the more quickly it will do things for you. If you get a desktop unit I recommend one or two Quad Core Xeon processors. In programs like Autodesk Viz, rendering speed is determined by the speed and number of processors—the faster the better.

**Memory:** 2 GB minimum.

RAM or Random Access Memory holds the information that the processor is working on. The more you have the more programs you can have open, the larger the files you can work with such as in Photoshop, and the more complex your 3D models can be. For the most part, 2 GB will suffice in third year but eventually you will want more. The maximum amount of RAM you can add is very important. Do not consider anything less than four Gig of total memory

**Graphics Card:** supporting 1280x1024 32-bit color with 256MB RAM and OpenGL and Direct3D hardware acceleration minimum. nVidia based graphic cards recommended.

The graphics card is responsible for processing graphic information, such as colors, number of pixels seen on your screen, video signals and 3D transformations. The best way to think about it is the better your graphics card the better it will be at rendering large 3D models for display on your monitor in real time. Make sure the card supports Open GL and Direct X 9.0. The card should have at minimum 256MB of built in memory. Do not buy a system with an integral graphic card. You do not need a really expensive graphics card for the work you will be doing. A mid-range card will serve you well.

**Hard Drive:** 100 GB or more at 7200 RPM.

The hard drive stores information. It holds the OS, your programs and your files until the processor and the RAM put them into action. The more capacity you have is generally better. The faster the hard drive can read information the faster your machine will access data. Make sure your computer has the capability to add a second internal HD. Having two HDs is encouraged. Stand-alone portable HDs are available for notebooks. You do not really need a RAID hard drive setup.

**Optical Drive:** 48X/32X CD-RW/DVD-RW Combo.

This drive will allow you to read software discs and also make CD or DVD copies for backing-up and distributing files. The higher the numbers the faster the drive is at reading and writing files. Good computer cases at this level allow you to have two 5.25-inch drives so you can add another drive later.

**Network Card:** Ethernet 10/100/1000.

You will need this card to hook up to the network in Seaton. You might consider a wireless card. Wireless support is coming to Seaton but no dates have been set.

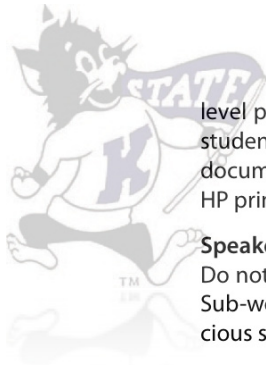
**Keyboard:** A good high-quality keyboard is important because they are easier to type on and just feel better. Bluetooth and other wireless means of connecting your keyboard (and mouse) are nice but not necessary. If you purchase a Mac and run windows under Bootcamp you will need a USB keyboard.

**Mouse:** Three-button optical wheel mouse.

Just like a keyboard a better mouse that fits nicely to your hand is important. The wheel between the right and left buttons is used for scrolling and zooming in programs like AutoCAD.

**Printer:** 8.5x11 color photo ink jet minimum (11x17 color ink jet preferred).

You will need a printer for printing at your desk. The photo quality printers are good for printing your renderings. An 11x17 (\$400) will allow flexibility in printing and students with the larger format printers get a lot of use out of them. Epson, Canon and HP are good choices. Most mid-



level photo printers (\$100 or more for an 8.5x11) with 5740 x 1440 dpi resolution will work. The student Plot Club provides service to students for a per sheet cost for large and small format documents. They have an 11x17 black and white and color laser printer as well as large format HP printers.

**Speakers:** Two small desktop Speakers and a set of Head Phones.

Do not spend your money on fancy speakers. Spend your money on a good set of headphones. Sub-woofers and so forth are great but they are a distraction in the studio and they take up precious space in your box. Music is not allowed to be played during third-year studios.

**Surge Protector:** A surge protector will protect your computer from spikes in current that can wipe out your system. An APS or auxiliary power source, or UPS (Uninterrupted Power Source) will run your machine for a short time if the power goes out but saving your work often is a less expensive alternative.

**Ethernet Cable:** You will use this to connect your workstation to the network. These can be purchased at the Union Computer Store when you know how long a cable you will need.

### **OPTIONAL HARDWARE**

**Scanner and Digital Camera.** A digital camera of at least 6 mega pixels and a flatbed scanner are useful for studio and course work but not essential for third year.

**USB Flash Memory Key:** (USB hard drive) 1 GB or larger. USB flash memory keys are an excellent way to do quick back-ups of large files or to transfer files between computers in studios or when the network is down and are often faster than burning a CD.

### **SOFTWARE**

The only software you must purchase for the course is the Adobe Creative Suite 3, SketchUp 6 student license, Microsoft Office 2007 and, of course, Windows Vista or Mac OS. The other software is provided for you. All of the software required is offered at an education discount for full time students. You can purchase all these programs except for SketchUp at the KSU Student Union Computer Store for very low prices.

The following software packages are required for the Computing in Architecture course:

#### **Microsoft Office 2007.**

You will need Word, PowerPoint, and Excel in your studies. You can get a student price at the KSU Union Computer Store. (This software is not used for computing in architecture but will be essential in all of your classes.)

#### **SketchUp 6 Pro.**

Each student will be required to purchase a \$49 one-year license for this 3D modeling software at the beginning of the semester.

#### **Adobe Creative Suite 3 Design Standard or Premium**

This is the core of much of the 2D graphic work you will do with your 3D models and drawings done in other software. The student cost is approximately \$300 at the KSU Computer Store

Photoshop: Used for manipulating images.

Illustrator : Used for making and manipulating vector based drawings.

InDesign: Used for laying out presentations.

Acrobat Pro: Used for preparing documents for printing.

The Premium version contains Flash and Dreamweaver for web design and an extended version of Photoshop and Illustrator. It is more expensive but I recommend it if your budget allows. The standard version will be OK for ARCH 472.

If you go with a Mac you need to decide on purchasing a Windows or Mac version of the software. There is not an easy answer to this. If you think that you will spend more time in Windows go with the Windows version and go with the Mac version if you think the opposite.



## **SUPPLIED SOFTWARE**

### **Viz, AutoCAD, and Revit Architecture.**

Used for drawing and 3D modeling work. You do not need to buy these, they are provided by the Autodesk Student Engineering and Design Community at [students.autodesk.com](http://students.autodesk.com)

NOTE: There is a chance that students will need to purchase a one-year license of Autodesk 3ds Max for approximately \$200.

### **AntiVirus Software**

The University will provide antivirus protection software that must be used by each student.

## **BOOKS**

Texts for the course are not all confirmed at this date due to the upgrades on the major packages we use. These will be announced in the fall and can be purchased on the web.

### **These required books will be used:**

*The Non-Designer's Design Book* by Robin Williams 3rd edition.

*Photoshop CS3 Essential Skills* by Galer and Andrews

*Introducing Revit Architecture 2008: BIM for Beginners* by Krygiel, Demchak and Dzambazova

## **STUDIO SETUP**

You need to have your computer ready to go in your studio the first week of studio to start the network setup procedures.

## **BOXES**

The Department of Architecture will provide a box to place your computer. The dimensions of the box are: 30 inches wide, 27 inches deep and 58 inches tall.

All students must use a Department of Architecture box. Personal storage solutions are not allowed.

## **COSTS**

Total cost of a minimum system with software will be around \$2500 to \$4000. Because this is a required purchase you should check with the financial aide department for an increase in funds available to you.

## **SUPPORT**

Computers and software unfortunately are finicky beasts that sometimes refuse to do what we want them to do. Given the large number of students, configurations, and limited resources the Department of Architecture cannot supply support for your machine. It is important that you purchase from a source that will provide good service. However, the College does provide limited assistance. The following is from the College Computer Networking Services web site (<http://capd.ksu.edu/cns/>):

*We are available for first line troubleshooting and support. We provide this service as a courtesy. Stop by the CAPD CNS office (Seaton 12) and fill out a work request and we will stop by at our earliest opportunity. In our experience the majority of the problems are caused by incorrect network settings configured by the user. These are easily solved.*

*Be aware that student-owned PCs are not our responsibility. The ultimate responsible party for student-owned PCs is the student. We cannot be responsible for replacing or installing components or software in student systems since the college cannot assume liability for your PC should any damage or failures occur in the process. Contact the manufacturer for warranty support or local vendors for walk-in service.*

**ARCH 472 FORMAT**

Computing in Architecture consists of a lecture on Thursday and lab time on Tuesday.

**QUESTIONS**

If you have any questions my e-mail is [mknnox@ksu.edu](mailto:mknnox@ksu.edu) or my office number is 785.532.1112. As a favor, please read this document carefully before asking questions. Students only please.

**WEB SITES**

<http://aalto.arch.ksu.edu/personal/knoxweb/arch472.html>

<http://capd.ksu.edu/cns/>

