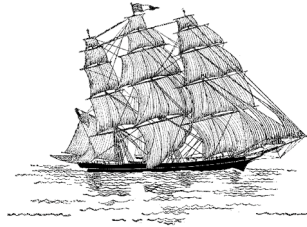# Architecture 207: Computer Aided Design / Drafting

Preliminary Course Description and Syllabus for Fall 2007
Updated 1 August 2007

General Description

Computer Aided Design/Drafting (CADD) has become an essential tool for architecture students while in school and for professional work. This course includes instruction in applying CADD techniques: producing measured two-dimensional drawings, building three-dimensional models, and rendering images. A quick introduction will be given on animation. This course will focus on AutoCAD and 3D Studio VIZ. Assignments will be given in these areas, and the final grade for the course will be based on completion of these assignments. Students will be expected to purchase reference materials, Zip disks or USB flash drives, and output materials (color printouts and plots). As the course focuses on graphic applications, it is equally applicable to engineering, film, cinema, theater, and others who have an interest in two-dimensional and three-dimensional computer modeling and rendering. If you have had substantial background using software such as AutoCAD 2D and a 3D modeling and rendering program, you might consider enrolling in a more advanced course. **Check with the instructor to see what other course might be appropriate: Architecture 307, 407, 507, or 599.**

Architecture 207 (**# 11207 R**) is a 2 unit class that meets for the first half of the semester only. Architecture 307 (**# 11221 R**). is a two unit course that meets at the same time for the second half of the semester. It is intended that students sign up for both Architecture 207 and Architecture 307 concurrently if they wish to have a full semester long set of courses (4 units total). You can sign up for just one of the courses, however, if that is what your schedule allows.

Homework Assignments

Assignments are usually one week in duration; although usually due on Wednesdays, please consult the dates on the syllabus for the specific due date for each assignment. **Late assignments will not be accepted; turn in what you have on the due date.** It is crucial that you turn in whatever you have done on the due date; the assignments build upon each other.   There are six assignments. Grades will be posted on Blackboard at totale.usc.edu . Students are strongly encouraged to come by with work in progress for suggestions before the assignment is due and come by after grading to learn how they could improve in the future.

Readings

There is a **required** textbook for this class. It is **Residential Design using AutoCAD 2006/2007/2008** by Daniel John Stine. All *Lessons* listed are from this book. It should be available at the USC Bookstore. It is also on reserve in the AFA library.

The is no required textbook for 3D Studio VIZ. However, I suggest that you purchase any book as a reference source. I have also uploaded several pdf files to Blackboard that you should download as references.

Other Important Items

You will need methods for backing up your assignments and for occasionally turning them in. I recommend portable hard drives and Flash drives. Do not just have one copy of your assignment! Have multiple backups! Label all media with your name and e-mail address. Bring the Flash drive to class each day with your current files.

A USC e-mail account is required for this course. Go on-line and verify that your USC account is working. Call 0-5555 if you have problems accessing your account. You will need to use your **USC account** for posting some assignments and for reading your email. Read your e-mail at least once a day!

If you have your own computer, please download AutoCAD (hint: download Civil 3D and only install the AutoCAD part) and 3D Studio VIZ from students.autodesk.com . Contact Enrique if you have problems (ebarajas@usc.edu). Other tutorials and help are also available at that website.

INTRODUCTION TO THE CLASS AND AUTOCAD

August 27, Monday   WPH B36   Lecture: Introduction, Administration, Course Overview
Show images and plots
Handout course descriptions with syllabi (Arch 207 and 307), all homeworks,
    AutoCAD Basic Command List, Architectural Imperial.dwt template file
Have students select buildings

Residential Design using AutoCAD 2006/2007 by Daniel John Stine
Lab: AutoCAD hands-on using commands covered in the book, *Lessons 1 - 4*

Homework 1: Introduction to AutoCAD, *Lessons 1 – 4;* building drawings

FUNDAMENTALS OF AUTOCAD
** Bring **Residential Design using AutoCAD 2006/2007** and all *Lesson* files to class every day on a Flash drive.

August 29, Wednesday   WPH B36   Lab: AutoCAD Workshop
Bring handouts from Monday

September 3, Monday   **Holiday**

September 5, Wednesday WPH B36   Lecture: blocks, dynamic blocks (Tool Palettes), DesignCenter, scale of blocks
www.ceco.net
Lab: *Lesson 7 (pg. 7-21 to 7-35, blocks and hatching)* in **Residential Design
    using AutoCAD 2006/2007**

Homework 1 due
Homework 2: Computer Aided Drafting (CAD): 11"x17" plans to scale

September 10, Monday   WPH B36   Lecture: hatching/shading (no gradients!), xref, grips
Lab: *Lessons 5 and 6* in **Residential Design using AutoCAD 2006/2007**

September 12, Wednesday WPH B36   Lecture: plotting techniques
Lab: mspace, pspace, lineweights, plotting, review solid hatching/shading (no
    gradients!)

Make sure that you have your homework 2 drawing files with you in class!

Homework 2 due
Homework 3: Plotting (24"x36", files): plans and elevations/sections

September 17, Monday   WPH B36   Lecture: vector / raster, file formats, constructing 3D models
Lab: AutoCAD to AutoCAD 3D, Photoshop, Illustrator, VIZ
Lab: Quick Introduction to 3D Studio MAX/VIZ using model pieces including
    attaching multiple lines together for elevation extrusions; transparency

FUNDAMENTALS OF 3D STUDIO VIZ MODELING

These files are available on Blackboard.
    Autodesk_VIZ_Reference_Vol1.pdf
    Autodesk_VIZ_Reference_Vol3.pdf
    Autodesk_VIZ_Reference_Vol2.pdf
    viz2008_tutorial_1_user_interface.pdf
    viz2008_tutorial_4_materials.pdf
    viz2008_tutorial_11_using_autocad_files.pdf

    ** additional tutorials available at students.autodesk.com

September 19, Wednesday WPH B36	Lab: Introduction to 3D Studio VIZ modeling Modeling: units, shapes (imported, drawn, same object), parametric modeling, stack and gizmo, modifiers (extrude, lathe) Transformation: selecting, move, rotate, scale Viewing: zoom, pan, layer, color, visibility Rendering: transparency, one/two sided Printouts: save and view renderings Lighting: environment light Villa Rotunda and glass storefront examples **Read:** Spline-Based Modeling in Autodesk VIZ **Read:** viz2008_tutorial_1_user_interface.pdf **Homework 3 due** Homework 4: Creating a Three Dimensional Model (black and white printouts)
September 24, Monday WPH B36	Lab: 3D Studio VIZ modeling Review – especially the idea of bringing in elements from AutoCAD Modeling: compound objects (Boolean operations, loft, terrain), box modeling introduction, grid, trees, stairs **Read:** viz2008_tutorial_11_using_autocad_files.pdf
September 26, Wednesday WPH B36	Lecture: 3D Studio VIZ lights and viewing Materials: very simple materials and colors: diffuse, transparent, two-sided Lighting: omni, direct, spot, sun, shadows Viewing / cameras: perspectives, axons, clipping planes **Homework 4 due** Homework 5: Expanding the Building Model (color printouts, shadows, perspectives)
October 1, Monday WPH B36	Question/answer and work session **Bring current homework files to class**

FUNDAMENTALS OF 3D STUDIO VIZ RENDERING

October 3, Wednesday   WPH B36   Lecture: Materials and Mapping
Lab: material editor, material library, UVW modifier

Read: viz2008_tutorial_4_materials.pdf

Homework 5 due
Homework 6: Rendering the Building (rendered jpg images; files)

October 8, Monday   WPH B36   Lecture: Bitmapped Textures
Review from Monday
Lab: jpgs as textures, sky

October 10, Wednesday   WPH B36   Question/answer and work session
Bring current homework files to class

INTRODUCTION TO 3D STUDIO VIZ ANIMATION

October 15, Monday   WPH B36   Lecture: key frame and motion path animation
Lab: introduction to animation, sun path animation
If time, look at renderings.

Homework 6 due

October 17, Wednesday   WPH B36   **Begin Architecture 307**

Please read.

REHABILITATION ACT (LAB 504) AND THE AMERICANS WITH DISABILITIES ACT (ADA)

The University of Southern California is committed to full compliance with the Rehabilitation Act (Lab 504) and the Americans with Disabilities Act (ADA). As part of the implementation of this law, the University will continue to provide reasonable accommodation of academically qualified students with disabilities so those student can participate fully in the University's educational programs and activities. Although USC is not required by law to change the "fundamental nature of essential curricular components of its programs in order to accommodate the needs of disabled students," the University will provide reasonable academic accommodations. The specific responsibility of the University administration and all faculty serving in a teaching capacity is to ensure the University's compliance with this policy. The general definition of a student with a disability is any person who has "a physical or mental impairment which substantially limits one or more of such person's major life activities," and any person who has "a history of, or is regarded as having, such an impairment." Reasonable academic and physical accommodations include but are not limited to: extended time on examinations; substitution of similar or related work for a non-fundamental program requirement; time extensions on papers and projects; special testing procedures; advance notice regarding book list for visually impaired and some learning disabled students; use of academic aides in the classroom such as note takers and sign language interpreters; early advisement and assistance with registration; accessibility for students who use wheelchairs and those with mobility impairments; and need for special classroom furniture or special equipment in the classroom.

Obtaining Accommodations

Physical Accommodations
Students with physical disabilities should contact Disability Services and Programs (DSP) prior to or during the first week of class attendance or as early in the semester as possible. The office will work with classroom scheduling, the course instructors and their departments, and the students to arrange for reasonable accommodations.

Academic Accommodations
Students seeking academic accommodations due to a physical or learning disability should make the request to the course instructor prior to or during the first week of class attendance, as well as registering with DSP as early in the semester as possible. Course instructors should require that a student present verification of documentation when academic accommodations are being requested. For assistance in how to provide reasonable accommodations for a particular disability, course instructors are encouraged to consult with Disability Services and Programs (DSP). Students requesting academic accommodations who do not have DSP documentation should be referred to that office.

Disability Services & Programs contact: (213) 740-0776

RELIGIOUS HOLIDAYS

The University of Southern California recognizes the diversity of our community and the potential for conflicts involving academic activities and personal religious observation. The University provides a guide to such observances for reference and suggests that any concerns about lack of attendance or inability to participate fully in the course activity be fully aired at the start of the term. As a general principle students should be excused from class for these events if properly documented and if provisions can be made to accommodate the absence and make up the lost work. Constraints on participation that conflict with adequate participation in the course and cannot be resolved to the satisfaction of the faculty and the student need to be identified **prior to the drop/add date for registration**. After the drop/add date the University and the School of Architecture shall be the sole arbiter of what constitutes appropriate attendance and participation in a given course.