Course Description

Arch 610 Winter Term 2009, 2 credit hours

This course introduces computer concepts and techniques for architectural design. It uses applications for developing and communicating two and three-dimensional design ideas to show how software supports design thinking. Students will model and edit 3D forms and spaces, render them in light and present results on the World Wide Web and in print media.

Students are responsible for developing competency in basic computer graphic skills through class and external resources.

Class Schedule

Large group, Tuesdays 10-11:50a in 246 Gerlinger (CRN 20675)

Optional Tutorial Sections:
- Wed 10:00-11:50a in B13 Klamath Mac lab (CRN 20675)
- Wed 10:00-11:50a in 101A McKenzie Windows lab (CRN 20677)
- Wed 6-7:50p Accelerated laptop section in 206 Lawrence (CRN 20678)

Objectives

- To understand how design exploration and analysis is supported by digital media.
- To develop skills in composing space and form with digital methods.
- To develop learning strategies for adapting to changing technology.
- To introduce an integrated architectural "toolbox" with digital and traditional media.
- To focus on the essence of each application and how applications can be used together.
- To address students with different levels of technical and creative backgrounds.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Software</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 5-7</td>
<td>Expressing your work on the Web</td>
<td>ePortfolio</td>
<td>&quot;www.yourshowroom.edu&quot;</td>
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<tr>
<td>Jan 12-14</td>
<td>3D Creation, Rendering &amp; Lighting</td>
<td>SketchUp</td>
<td>&quot;Climbing Sculpture&quot;</td>
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<td>Jan 21</td>
<td>3D Modeling II and Rendering</td>
<td>SketchUp, IDX Renditioner</td>
<td>&quot;Sculpted Shadows&quot;</td>
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<td>Jan 26-28</td>
<td>Image Manipulation &amp; Rendering Techniques</td>
<td>Photoshop, IDX Renditioner</td>
<td>&quot;Place to Place&quot;</td>
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<td>Feb 2-4</td>
<td>5 Image Manipulation &amp; Rendering</td>
<td>IDX Renditioner, Photoshop</td>
<td>&quot;Overlay Rendering x2&quot;</td>
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<tr>
<td>Feb 9-11</td>
<td>6 Drawing</td>
<td>Illustrator &amp; SketchUp</td>
<td>&quot;Analytic Exposure&quot;</td>
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<td>Feb 16-18</td>
<td>Graphic Layout I</td>
<td>Illustrator</td>
<td>&quot;Supersize It!&quot;</td>
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<tr>
<td>Feb 23-25</td>
<td>Graphic Layout II</td>
<td>Illustrator, InDesign</td>
<td>&quot;Design Brochure&quot;</td>
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<td>Mar 2-4</td>
<td>Conferences</td>
<td>All Tools</td>
<td>&quot;Design Brochure&quot;</td>
</tr>
<tr>
<td>Mar 9-11</td>
<td>Conferences</td>
<td>All Tools</td>
<td>&quot;Design Brochure&quot;</td>
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Mar 16 Final Review, 8-11am

The class will have instruction weeks 1-8, conferences weeks 9 & 10 and a final review 11. Attendance is expected. Unexcused absences or tardiness diminishes participation points, potentially leading to no credit.

Methodology

Large group sessions will explain design concepts through examples and demonstration, supplemented by hands-on work on student laptops. The tutorial sections are hands-on workshops with hands-on guidance and assistance.

Prerequisites

None. Open to non-architecture majors with instructor's permission.
Expected Behavior

Students are expected to take responsibility for their own learning, accessing online and face-to-face tutorials.

- **Foster a learning community**: Contribute to class discussions, activities and resources. Respect others. Learn from different backgrounds, opinions & talents
- **Come to class prepared.**
- **Communicate**: Learn by asking questions, seek help early. Contact your tutor, come to office hours.

Requirements

- Timely submission of weekly assignments
- Active participation in a group project
- Successful completion of an online quiz
- Final digital portfolio summarizing the term's work
- Class attendance, participation & demonstrated comprehension of assigned readings & websites.

Required Software

All students must have primary access to a graphics personal computer and the required software and accompanying manuals:

- Google Sketchup Pro - version 7
- IDX Renditioner
- Adobe Creative Suite - version 4 preferred
- Mozilla Firefox Web browser

Sketchup Pro, IDX Renditioner 1.1 and Firefox are available online. Adobe Programs (Adobe Web Collection) are available at Techhead.org.

Required Course Materials

Video tutorials are online at Sketchup.com and Lynda.com. Students are expected to subscribe to Lynda.com for the term with the class discount rate. Recommended readings are on reserve in the library.

Grading

Assignment grades are based on the following criteria:

- Concept - appropriateness to the assignment
- Design Quality
- Technical Competence
- Completeness

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Points</th>
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<tbody>
<tr>
<td>Weekly Assignments - 7 * 7 weeks</td>
<td>49</td>
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<tr>
<td>Final Group Project</td>
<td>14</td>
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<tr>
<td>Self-access quiz</td>
<td>7</td>
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<tr>
<td>Portfolio</td>
<td>20</td>
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<tr>
<td>Participation</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
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For each 7 point assignment, 7 = A, 6 = B, 5 = C, 4 = D, 0-3 = F. 83 points are required for a Pass.

At the end of the term, students will vote to award bonus points for Most Improved Beginner and Most Helpful Student as well as Best Overall Performance. The instructor and GTF's will assess the final portfolio and poster for the ability to apply technical tools to creative design problems. The portfolio must include assignments 1-7 and may optionally include other applications of digital media.

All assignments are must be uploaded before the weekly lecture session unless noted otherwise. To encourage timeliness, students need to submit a draft on time to have the potential to earn full points, late assignment hand-ins will be penalized. You may submit revised work for periodic re-evaluation if you have submitted a draft on time. It is your responsibility to make sure that your GTF knows your assignment is completed. If disaster strikes you may an e-mail or hardcopy.

Students who require special conditions for optimal learning and students who prefer to be graded by Prof. Cheng rather than their GTF, should inform the professor.
Arch 610 Introduction to Computer Graphics

Assignment 1: "WWW.YOURSHOWROOM.EDU"
Student Role: Curator

- Launch of the UO[v]MoMA website: your virtual exhibition space
- Orientation to learning resources
- Web communications in architectural design and education
- Form and Content: Website structure, embedded images, linked files and formatting
- Copyright and intellectual property guidelines
- Software: Plone ePortfolio blog or an existing website, Photoshop

You will create your own virtual museum, University of Oregon (virtual) Museum of Modern Art on the ePortfolio website. UO[v]MoMA is the hub for the student art and design work. In the role of the curator, you will set up your personal showroom, beginning with a creative project summary and its inspiration. Over the next weeks you will add work to this virtual display to culminate in a final version at the end of the term. Like any other museum, the individual presentation areas must be able to display different forms of expression under a single identity.

Purpose
This exercise introduces Internet communication as a personal expression and guides students in establishing an online presence.

Objectives
To understand

- the relationship of form, content, and perception in graphics
- applying fair use guidelines for intellectual property
- how to download files from remote locations to the local disk
- how to scan, crop, improve and resize images
- how to format text and graphics on a web page and create links

PLEASE NOTE: In order to kickstart the UO[v]MoMA, item I is due Wednesday Jan 7. The rest is due, as all subsequent assignments, the following lecture session from when they are introduced.

I. SELF IMAGE
Use a digital camera or scanner to capture your face or a self-portrait. Open the picture in Photoshop and crop and resize the image to create both a 200 x 200 pixel and a 100 x 100 pixel image. Name the picture lastname_firstname.jpg. Send an e-mail to your GTF, including your name, section info and attach the smaller picture.

II. PLAN
Plan your virtual showroom on the Eportfolio system: Think about who is in your audience and what you want to showcase. Find or create an art or design piece that has a strong
relationship to an inspiration. Write about 300 words to describe your project and its inspiration.

- How was the creative process shaped by tools and methods?
- How was the work's visual presentation shape viewer perceptions?
- Include a citation of the Author, title, source and the year of the work.

III. STUDY
1. Login to Lynda.com and watch Photoshop Essential Training: 1. The interface, 2. Basics (especially resizing) and 6. PhotoManipulation (cropping).
2. Watch the first two Plone introductory videos, and read the tutorial.
3. Read enough about Copyright to pass the Copyright Challenge.

IV. PREP IMAGES
Prepare at least 3 graphic images, starting with scans, digital photos or downloaded public domain images:
1. a face-photo or self-portrait ~200 x 200 pixels (part I.)
2. a visual art or design piece you have created ~600 x 600 pixels
3. an inspiration for your creative work ~100 x 100 pixels

Resize, improve and crop the images in Photoshop. Using the “Save for Web” command, save the image as a high quality JPEG. Images for the first assignment should be named 610.1a.jpg, 610.1b.jpg, 610.1c.jpg, etc. (this facilitates automatic collection).

V. CREATE (see the detailed tutorial)
1. Create a Home page to become familiar with the visual editor: the title should be your full name so it can be searched.
2. Set up the directory structure. Inside the Home folder or Root directory, create a Graphics folder and inside that, a folder called A1 for your first assignment.
3. Upload the images and insert them onto the pages, make links between pages.

FOR THE ADVANCED
- Develop an existing website
- Create custom graphics
- Start on the Sketchup tutorials.

REFERENCES
Bill Buxton's Sketching User Experiences
http://www.billbuxton.com/
Yale Web Style Guide: a classic breakdown of what matters for the web
http://webstyleguide.com/
Fair Use Guidelines: quick overview
http://w2.eff.org/IP/eff_fair_use_faq.php
Stanford University Library's Copyright & Fair Use site: thorough, well-written
http://fairuse.stanford.edu/Copyright_and_Fair_Use_Overview/
Test yourself with the Copyright Challenge
http://www.copyrightkids.org/quiz/quizindex.htm
Creative Commons
http://creativecommons.org/about
BSK Arkiteckten's Swedish Post
http://www.bsk.se/thinktank/english/thinktank_content.html
Learning and Working in the New Collaborative Age
http://www.edutopia.org/randy-nelson-school-to-career-video
Arch 610 Bibliography: Digital Architectural Design
Nancy Yen-wen Cheng – revised Jan 3, 2009

DIGITAL MEDIA – GENERAL
T385.K45(2nd ed.) In-depth view of modeling, rendering, animation, and post-
processing with concepts and practical guidelines clearly spelled out. Covers
production with insight into the industry. Eye-popping graphics.
Ashford, Janet & J. Odam, Getting Started in 3D, TR897.5 .A85 1998:
A fun, picture-filled introduction to computer modeling and rendering. Examples
are oriented towards using graphics for illustration rather than realistic
representation.
Exquisitely illustrated book explains how to achieve professional results,
explaining the process without a bias towards one specific software.
http://www.3Drender.com
Textbook with clear technical explanations of digital graphic tools and artistic
applications. Strong creative examples. Not focused on architecture, dated.
*Weishar, Peter, Digital Space: Designing Virtual Environments, NA2728 .W43 1998:
Oriented towards creating virtual sets for the entertainment industry, this book is
filled with useful how-to tips and tricks for 3D modeling and rendering.

DIGITAL MEDIA - ARCHITECTURAL
Association for Computer Aided Design in Architecture (ACADIA) conference proceedings:
Papers present digital media theory, tool developments, teaching and practice
applications. (see CUMINCAD paper index: http://cumincad.scix.net for latest)
2001 http://books.google.com/books?id=BP3R2AEnM7sC
*Eastman, Chuck et. al., BIM Handbook: A Guide to Building Information Modeling for
Owners, Managers, Designers, Engineers and Contractor, 2008. TH437 .B53
.K35 2004. Explains CAAD topics from virtual environments to automated
construction.
NA2728 .R33 2006. Connects concepts to cutting-edge processes, forms and
resulting experiences
Categorizes and explains different ways that computer graphics can be used for
architectural design. Excellent images.
Responsive architecture
DIGITAL MEDIA - ARCHITECTURAL FABRICATION
Aranda, Benjamin & Chris Lasch, Tooling, AAA NA2728 .A58 2006 Explains how algorithms can create interesting form.
Neumann, Oliver & Philip Beesley, Futurewood : innovation in building design and construction, Riverside Architectural Press, 2007
Stacey, Michael, Digital Fabricators. TH1095 .D54 2004

DESIGN PROCESS, VISUALIZATION & COGNITION

DESIGN DRAWING

DIAGRAMMING
White, Edward T., Site analysis : diagramming information for architectural design / NA2540.5.W48 1983. What information to seek, how to record and analyze it, how to use it for design.