

## ARC 251 Architecture Representation

NCSU, SOA

### TIME AND LOCATION:

Lecture: T 1:30 – 4:15; 140 WI

Lab: TH 7:10 – 9:55; Brooks 320

### FACULTY:

Jeremy Ficca, Assistant Professor, Architecture  
Office Hours: T 10 - 12 by appointment, 301A Brooks Hall  
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### TEACHING ASSISTANTS

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### INTRODUCTION:

REPRESENTATION, as both a communicative device and conceptual tool, is integral to all facets of the process of architecture. Given that much of the practice of architecture is removed from the reality of building, representation acts as a mediator between the conceptual and the built. It is both a means to an end and an end in itself, inherently an abstract symbol, through which architects catalog and express design intent.

This course examines methods of analog and digital representation and seeks to impart students with a repertoire of visual communicative techniques. A majority of course time covers digital media, which has reinvigorated historical methods of representation such as perspective and ushered in novel methods of communication and simulation. It is a medium inherently in flux, providing an increasingly complex array of tools whose application is redefining traditional design methodology.

### COURSE TEXTS:

Required texts for the course can be purchased from most major online bookstores.

#### REQUIRED:

3DS MAX 8 BIBLE  
Murdock, Wiley, 2006

MASTERING AUTOCAD 2007 & LT 2007 \*  
Omura, Sybex, 2006

\*Course instruction will cover AutoCad 2007 (since yearly updates are minor, students should purchase the book that matches their software version. AutoCad 2005 and 2006 is fundamentally the same as 2004)

#### OPTIONAL:

ESSENTIAL CG LIGHTING TECHNIQUES  
Brooker, Focal Press, 2003

3DS MAX 6 KILLER TIPS  
Bell, New Riders, 2004

#### RESERVE:

THE ART OF COLOR: THE SUBJECTIVE EXPERIENCE AND OBJECTIVE RATIONALE OF COLOR  
Itten, Johannes  
ND1493.IB 1993

THE PROJECTIVE CAST: ARCHITECTURE AND ITS THREE GEOMETRIES  
Evans, Robin  
NA2760.E93 1995

VIRTUAL DIMENSION  
Beckman, John  
NA2543.T43 v57 1998

CONVENTIONS OF ARCHITECTURE REPRESENTATION; REPRESENTATION AND MISREPRESENTATION  
Ackerman, James

DISCREET 3DS MAX 7 [instructional electronic resource]  
VTC training CD  
2005 DISC 1-2

RHINO 3D [instructional electronic resource]  
VTC training CD  
2005 DISC 1-2

3DS MAX MASTER CLASS SERIES [instructional electronic resource]  
DISCREET  
TR897.7 .A156 2004 DISC 1,2,3

3DS MAX 7 FUNDAMENTALS AND BEYOND COURSEWARE MANUAL AND DVD / DISCREET  
Autodesk  
TR897.7 .A15 2005

DIGITAL LIGHTING & RENDERING  
Birn, New Riders, 2000

DIGITAL TEXTURING & PAINTING  
Demers, New Riders, 2002

**ORGANIZATION:**

**LECTURES AND TUTORIALS:**

The course is divided into two segments; analog and digital. Classes are divided into two segments, lectures and tutorials. Students are expected to attend both.

**LAB SESIONS:**

Teaching Assistant run weekly lab sessions will provide follow up instruction to weekly lectures.

**ASSIGNMENTS:**

Detailed assignment descriptions are posted on the course website. Completed assignments are due as noted on the course calendar, unless otherwise noted. Each assignment must be posted on your website and viewable for the following class. Follow the file naming conventions described with each assignment. Late assignments are not accepted and receive a grade of 0.

**COMPUTERS:**

Following school of Architecture requirements, each student is required to purchase a laptop computer that meets the minimum computer requirements established by the College of Design. Laptops are used in the instruction of this course and are required for each class.

**RESOURCES:**

**COURSE WEBSITE:**

The course syllabus and all course support material, including tutorials and reference guides can be found online on the NCSU Wolf Ware course website at the following link:

<http://courses.ncsu.edu/arc251/lec/001/>

**TRAINING DVDS AND CDS**

The library course reserve contains 3ds Max video training material from Discreet and VTC. These can be checked out for a short time and viewed on your laptop. Students are expected to review this material.

**WEEKLY TA SESSIONS:**

A teaching assistant is available for individual assistance. The weekly time and location is TBD. Please respect the teaching assistant's schedule and refrain from disturbing the assistant outside of scheduled class and help sessions.

**MESSAGE BOARD:**

This course has a message board with frequently asked questions and answers. Review this message board periodically to find solutions to common difficulties and post questions you have concerning the software. You will need to log into the message board.

**HANDOUTS:**

There is a collection of PDF tutorials and reference documents for most topics covered in class. You are encouraged to reference these for solutions to your problems.

**WEBLINKS:**

Noteworthy links to helpful websites are provided on the course website.

**COMPUTERS / SOFTWARE:**

- Following school of Architecture requirements, each student is required to purchase a laptop computer that meets the minimum computer requirements established by the College of Design.  
**Laptops are used in the instruction of this course and are required for each class.**
- Students are strongly encouraged to fully charge their battery prior to class to ensure battery life for the duration of class. There are a limited number of power outlets in the room. Come prepared.
- Students are expected to purchase and install the following software packages:  
Adobe Illustrator CS2 or higher  
Adobe Photoshop CS2 or higher  
Autodesk AutoCAD 2005 or higher  
Discreet 3ds Max 8 or higher  
  
Academic discounted software can be purchased from the following vendors:  
The CAD Store  
Academic Superstore
- Temporary demo version s of the following software can be downloaded from the respective developers::  
Macromedia Fireworks  
Macromedia Dreamweaver  
Rhino

**OPERATING PROCEDURES:**

**ATTENDANCE:**

Due to the nature of course instruction, attendance and on time arrival is critical and required. Attendance will be logged. You are allowed 1 excused absence, each absence there after results in a 5 point deduction from your total grade. Students found logging attendance for absent students is strictly forbidden. All students involved will receive a 20 point deduction from their total grade.

**DISTRACTIONS:**

Use of Cell Phones, Pagers and all other communication devices is prohibited during class time. STUDENTS USING ANY FORM OF CHAT OR PEER TO PEER SOFTWARE WILL BE ASKED TO LEAVE CLASS.

**ASSIGNMENT COMPLETION:**

Each assignment must be posted on your website and viewable by 8pm on the evening prior to the date due. Late assignments are not accepted and receive a grade of 0.

**SICKNESS AND EMERGENCIES:**

Please contact me if you must miss class for sickness or other another emergency. This will enable us to discuss the duration of missed classes and plan as best to prevent you from falling behind.

**DISABILITIES:**

Students with disabilities should contact me to schedule a meeting to discuss academic accommodations. Please be prepared to provide the university accommodation letter.

**EVALUATION:**

A – F grading convention is used in this course with +/- half grades.

- A Highly advanced technical and design skills clearly evident through consistently rigorous work. Proven experimentation with various media. All assignments completed on time.
- B Above average technical and design skills. Marked development in design and technical skills over the course of the semester. Potentially 1 missed assignment.
- C Produces average work that fulfills the bare requirements of each assignment. Potentially 2 missed assignments.
- D Assignments lack the depth of understanding for the issues at hand. Work is insufficient and incomplete. Potentially 3 missed assignments.
- F Requirements of course not met. Missing 5 or more assignments

#### ASSIGNMENT GRADING IS AS FOLLOWS

Assignment 1 [Photo Composition]:	10 points
Assignment 2: [Sections   Diagrams]:	15 points
Assignment 3: [2d   3d diagrams]	15 points
Assignment 4: [2d   3d diagrams]	15 points
Assignment 5: [Renderings]	20 points
Assignment 6: [Renderings]	25 points
A+ =	100 points

#### **Religious Holidays, Sickness or Other Emergencies:**

Please contact me if you must miss studio for sickness or other another emergency. This will allow us to discuss the duration of missed classes and plan as best to prevent you from falling behind.

#### **Health and Safety:**

As part of your educational experience at the College of Design, you will be expected to participate in classes, field trips, and workshops in locations both on and off campus. You will be expected to fulfill your class assignments using equipment, tools and machinery. It is expected that you will use proper care and caution and will assume responsibility for your health and safety.

#### **Honor Code:**

All students who enroll at NC State are required to adhere to the guidelines for academic integrity as outlined in the NCSU Code of Student Conduct. For more information contact the Office of Student Conduct at 515.2963 or access the Code at the following web site: [www2.ncsu.edu/ncsu/studaffairs/counselingcenter/bss/](http://www2.ncsu.edu/ncsu/studaffairs/counselingcenter/bss/)

#### **Students with Disabilities:**

Students with disabilities that may affect participation in this class should notify the instructor so that any necessary adjustments can be made. You may also contact the NSU Disability Services for Student Center regarding campus services at room 2000 Harris Hall or on the web at [www2.ncsu.edu/studaffairs/counselingcenter/bss/](http://www2.ncsu.edu/studaffairs/counselingcenter/bss/)

#### **University syllabus details:**

[www.ncsu.edu/provost/academic\\_policies/syllabus/reg.htm](http://www.ncsu.edu/provost/academic_policies/syllabus/reg.htm)

ARC 251 – S2007

SCHEDULE:

**1.10 Studio – Formal Operations Assigned**

1.16 Lecture: Course Introduction | Website Template | Personal server space access  
Photoshop | digital collage

Reading: Conventions of Architectural Drawing: Representation and Misrepresentation  
"Introduction: The conventions and rhetoric of architectural drawing", James S. Ackerman  
pgs. 9-36

Reference: Mastering AutoCAD 2007, Chapters 1,2,3

1.18 Lab - Input | Raster technology | Photoshop | Output to print – screen – web

1.23 Lecture: Lecture: AutoCAD 2d Introduction | Fundamental Concepts | Basic Drawing Tools

Reading: The Virtual Dimension. "Terminal Velocities: The Computer in the Design Studio",  
Stan Allen

Reference: Illustrator - tbd

1.25 Lab – AutoCAD 1

**1.26 Studio – Formal Operations Due | Precedent Analysis Assigned**

1.30 Lecture: Illustrator | Vector technology | digital collage | Output to print - screen -web  
**Due: Assignment 1 – Formal Operations Poster**

Reference: Mastering AutoCAD 2007, – Chapters 5,6,7

2.1 Lab – Illustrator | AutoCAD 2

2.6 Lecture: AutoCAD 2d | Extended Drawing Tools | Printing – Plotting  
**Initial Review: Assignment 2 – Precedent Section and Diagram Drawings**

Reference: Mastering AutoCAD 2007 – Chapters 8,9

2.8 Lab – AutoCAD 3

**2.12 Studio – Precedent Analysis Due / Performance Spaces Assigned**

2.13 Lecture: AutoCAD 2d | Advanced Drawing Tools | XREF | Blocks | Hybrid techniques  
**Due: Assignment 2 – Precedent Section and Diagram Drawings Initial Review**

Reference: Rhino Level 1 Training Manual (pdf) – Chapters 1,2,3,4  
[Video] VTC Rhino Training Series "Viewports", "Modeling in Rhino", "Basic Tools", "Working with Primitives"

2.15 Lab – AutoCAD 4 | Rhino 1

2.20 Lecture: Rhino 2d and 3d Introduction

Reference: Rhino Level 1 Training Manual (pdf) – Chapters 5,6,7,8  
[Video] VTC Rhino Training Series "Creating Curves", "Curve & Surface Tools", "Solid & Surface Tools"

2.22 Lab – Rhino and Illustrator integration

2.27 Lecture: Rhino 2d and 3d Extended Modeling Tools  
**Due: Assignment 3 – Theater Precedent 3d Diagrams**

Reference: 3ds max 8 Bible - Chapters 1,2,3  
[Video] VTC 3ds max Training Series "Getting Started", "Working with objects", "Using 2d Shapes to make 3D objects"

3.1 Lab – Rhino 3

- 3.6 No Class - Spring Break
- 3.8 No Lab - Spring Break
- 3.13 Lecture: 3ds max | Introduction | Interface setup | fundamental concepts | AutoCAD file linking  
**Initial Review: Assignment 4 - Performance Center 3d Diagrams and Spatial Massing**
- Reference: 3ds max 8 Bible – Chapters 5,6,7,8,9  
 [Video] VTC 3ds max Training Series “Modifying Objects”, “Transforming & Cloning”
- 3.15 Lab – 3ds max 1
- 3.19 **Studio – Circulation and Program Distribution pin-up**
- 3.20 Lecture: 3ds max | Basic Modeling Tools | Basic Modifiers  
**Due: Assignment 4 - Performance Center 3d Diagrams and Spatial Massing**
- Reference: 3ds max 8 Bible – Chapters 12,13,18  
 [Video] VTC 3ds max Training Series “Transforming & Cloning”, “Groups & Layers”
- 3.22 Lab – 3ds max 2
- 3.27 Lecture: 3ds max / Materials, lighting and rendering fundamental concepts | Animation fundamental Concepts
- Reference: 3ds max 8 Bible – Chapters 22,23,24,25  
 [Video] VTC 3ds max Training Series “Previewing & Rendering”, “Basic Cameras & Lights”
- 3.29 Lab – 3ds max 3
- 4.3 Lecture: 3ds max | Advanced Modeling Tools | Advanced Modifiers  
**Initial Review: Assignment 5 - Performance Center Tectonic and Material Condition Renderings**
- Reference: 3ds max 8 Bible – Chapters 28,29,30,33
- 4.5 Lab – 3ds max 4
- 4.9 **Studio – Tectonics and Materiality Review**
- 4.10 Lecture: 3ds max | Materials, lighting and rendering advanced concepts 1 | light tracer | radiosity | vray  
**Due: Assignment 5 - Performance Center Tectonic and Material Condition Renderings**
- Reference: None
- 4.12 Lab – 3ds max 5
- 4.17 Lecture: 3ds max advanced rendering concepts 2  
**Initial Review: Assignment 6**
- Reference: None
- 4.19 Lab – 3ds max 6
- 4.24 **Due: Assignment 6(undergrad)**
- 4.26 Lab – 3ds max 7
- 4.27 **Studio – Performance Center Final Review (undergrad)**
- 5.1 **Due: Assignment 6 (grad)**
- 5.4 **Studio – Performance Center Final Review (grad)**

## **ASSIGNMENTS:**

### **Assignment 1: Formal Operations Poster**

#### DESCRIPTION:

- Manipulate four black and white photographs of your formal operation object.
- Scan one charcoal drawing of a spatial condition within the object.
- Compose the 5 images along with your definition onto one 18 x 24 poster.

#### SPECIFICS:

Adjust scanned images to be clear. The overall composition of the text and images must be taken into account. Consider the use of color, tone and transparency to create a visual narrative across the poster.

Save the final image as a jpeg and place this file in your www folder. Be sure the link works properly.

#### FILENAME:

assignment1.jpeg

#### SIGNIFICANT DATES:

Due 1.30.07

#### MAXIMUM GRADE: 10

You will be graded on comprehensiveness of information, legibility and composition.

### **Assignment 2: Precedent Section and Diagram Drawings**

#### DESCRIPTION:

- Cut a vertical section through your precedent building and site. Adjust lineweights and selectively collage an image for texture.
- Generate 2d diagrams of two significant formative ideas found in your precedent.

#### SPECIFICS:

Use AutoCad to complete your drawing. Add as much detail as you can using the material on your building. When the drawing is complete be certain you have no more than 4 layers, each corresponding to a lineweight that you will define in Illustrator. It is critical that all your drawing objects are on the correct layers. Save the file as AutoCad format. Open the file in Illustrator and apply a unique lineweight (stroke) to the objects on each layer. Selectively use color to assist the communication.

Export this file as SVG format and place in your www folder.

#### FILENAME:

assignment3.jpeg

#### SIGNIFICANT DATES:

Review 2.06.07

Due 2.13.07

#### MAXIMUM GRADE: 15

You will be graded based upon the amount of information conveyed, legibility and general quality of the linework within the drawing. Composition of the drawing upon the sheet and use of color and tone will also affect the grade.

### **Assignment 3: Theater Precedent 3d Diagrams**

#### DESCRIPTION:

- Generate three-dimensional diagrams of significant spatial, programmatic and contextual relationships found within your theater precedent

#### SPECIFICS:

For this exercise you will utilize AutoCAD, Rhino and Illustrator to generate a series (no less than 3) of three-dimensional diagrams. They must selectively utilize color and should be considered as part of a set.

Export this file from Illustrator as SVG format and place in your www folder

FILENAME:  
assignment3.svg

SIGNIFICANT DATES:  
Due 2.27.07

MAXIMUM GRADE: 15

You will be graded based upon the amount of information conveyed, legibility and general quality of the linework within the drawing. Viewing position is equally critical. Composition of the drawing upon the sheet and use of color and tone will also affect the grade.

#### **Assignment 4: Performance Center 3d diagrams and spatial massing**

DESCRIPTION:

- Generate three-dimensional diagrams of the circulation and program distribution within your performance center.
- Generate three-dimensional spatial massing renderings

SPECIFICS:  
For this exercise you will utilize Rhino and Illustrator to generate your diagrams.

Export this file from Illustrator as SVG format and place in your www folder.

FILENAME:  
assignment4.svg

SIGNIFICANT DATES:  
Review 3.13.07  
Due 3.20.07

MAXIMUM GRADE: 15

You will be graded based upon the amount of information conveyed, legibility and general quality of the linework within the drawing. The use of lineweights will be affect the grade. Composition of the drawing upon the sheet and use of color and tone will also affect the grade

#### **Assignment 5: Performance Center Tectonic and Material Condition Renderings**

DESCRIPTION:

- From within 3ds Max, construct a detailed three dimensional model of a materially complex segment of your Performance Center. While these renderings are intended to communicate a tectonic | material condition of your project, the use of materials within the rendering software must be used sparingly.
- Focus on qualities of materials more so than colors of materials. Consider the scope and scale of your model carefully.
- Establish a light source(s) for your model.
- Position three cameras and produce three renderings.

SPECIFICS:  
Produce three renderings, each to the size of 1280 x 1024. Save these files as JPEG's and place them in your www folder.

FILENAME:  
assignment5a.jpeg  
assignment5b.jpeg  
assignment5c.jpeg

SIGNIFICANT DATES:  
Review 4.03.07  
Due 4.10.07

MAXIMUM GRADE: 20

Broadly stated, you will be graded on the completeness of the model and visual quality of the renderings. In general the more tectonic focused modeling, the better. Just as with hand drawn perspectives, the view cone must be carefully considered. Lighting is critical and must be thoughtfully positioned and numbered. Use restraint with materials, more is not necessarily better.

#### **Assignment 6: Performance Center Experiential Renderings**



DESCRIPTION:

- From within 3ds Max, construct a three dimensional model of your Performance Center. It is expected that your model will have a significant amount of detail such as doors, windows and structural elements.
- Establish a light source(s) for your model.
- Position three cameras and produce three renderings.

SPECIFICS:

Create three independent cameras. Experiment with camera position, lenses and clipping. Keep your lighting simple at first and be certain to have control over your shadows. Advanced lighting must be utilized as either Light-Tracer, Radiosity or V-Ray. You are encouraged to utilize the render farm to complete these renderings.

Produce three renderings, each to the size of 1280 x 1024. Save these files as JPEG's and place them in your www folder.

FILENAMES:

assignment6a.jpeg

assignment6b.jpeg

assignment6c.jpeg

SIGNIFICANT DATES:

Review 4.17.07

Due 4.27.07 (undergrad)

Due 5.01.07 (grad)

MAXIMUM GRADE: 25

Broadly stated, you will be graded on the accuracy of the model and visual quality of the renderings. Major building elements such as floors, walls and openings must be correctly located. In general the more detail, the better. Just as with hand drawn perspectives, the view cone must be carefully considered. Lighting is critical and must be thoughtfully positioned and numbered. Use restraint with materials, more is not necessarily better.