Visualizing Architecture
Digital Techniques in Representation

Instructor: Karen Lewis
Office: KSA 232
Office Hours: Tuesdays, 11:30–1:30 and Wednesdays, 12:00–1:30
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Lecture Times: Tuesdays, 10:20–11:15
Location: Gateway Cinema, Theater 3

Lab Times Group A: T, 12:00–12:55 and Th, 10:20–11:50
Group B: T, 1:10–2:05 and Th, 12:05–1:35
Lab Location: Knowlton Hall 430

Credit Hrs: 3 units

Architectural Representation I is the first semester in a year-long sequence that introduces students to digital techniques in architectural representation. The first semester covers fundamental digital drawing and modeling techniques; the second semester explores contemporary output techniques related to three-dimensional modeling.

In this class, we will investigate the ways in which architects use forms of representation to make statements about their designs. Specifically, we will look how drawings, digital models, diagrams and presentation techniques are used as modes of representation that not only link architectural forms to ideas but also are an integral part of the process of designing and understanding architecture. Every architectural project is as much an exploration of the possible forms of these modes of representation as it is the development of a building design. This is especially true in contemporary practice. Drawings are still based in plan, section, elevation, and perspective, but these are linked together to afford new relationships as well as new insights into architectural projects. Computer models exploit digital and physical possibilities in a variety of ways. And diagrams have evolved from the once ubiquitous bubble diagram, popular since the 1950s, allowing other disciplines to shape the form and understanding of architecture.

The class is broken into seven assignments, each focusing on a different mode of architecture representation: orthographic projection (section), physical and digital models, perspectives, diagrams and presentations will be discussed and tested. Each mode will comprise an introductory lecture, a few weeks of hands-on representation labs, and a culminating assignment. In the lectures, we will focus on contemporary practice to explore the possible forms of representation and the ways in which drawings help architects shape and make statements about their work. The labs will be a chance to practice and exploit these drawing skills as gleaned from the lectures. And the assignments will synthesize the concepts demonstrated, as well as give students direct feedback on how they have approached the problem. It is understood the class focus is not on learning software, but rather on how contemporary modes of representation position, communicate and demonstrate an architectural thesis.
COURSE GOALS
Along with introducing you to the computer programs that inform an understanding of how to visualize and be critical of architectural representation, this course focuses on developing your abilities to:

- Produce clear, accurate, expressive drawings that demonstrate an understanding of the modes of architectural communication
- Demonstrate an ability to discover, evaluate, and clearly present drawings in support of a visual argument
- Synthesize and organize architecture ideas through various modes and scales of representation
- Be aware that composing a successful drawing frequently takes multiple drafts, with varying degrees of focus on generating, revising, editing and proofing your work

GENERAL COURSE REQUIREMENTS
- Use of computers, cell phones and other electronic equipment during lectures is prohibited.
- During the labs, only the instructed software programs may be opened and used.
- Hand in all drawing assignments on paper (as per the assignment requirements included in the syllabus).
- Keep electronic copies of all of your work. Final documentation will be turned in on paper and electronically.
- Save back-ups of your work. Computer crashes and technology failures are not accepted reasons for late or missing work.

COURSE STRUCTURE AND MATERIALS
The schedule for this course is organized to support different methods of learning representation techniques and critical analysis.

- **Lectures:** Tuesdays, 10:20-11:15, Gateway Cinema, House 3
  The lectures will introduce you to different kinds of representation techniques architects have used throughout history and continue to produce, critique and position today. The lectures serve as a visual survey to inform your visual repertoire and inspire you to position your own work within the context of architecture representation history.

- **Labs:** Sections are offered on Tuesdays directly after lecture from 12:00–2:05 and Thursdays, from 10:20–1:35, KSA 430
  Each student will sign up for one lab section. The labs will be run by the TA's and will review the software programs as well as answer general software questions. TAs will also provide direct feedback on assignments.

- **Software Instruction:** [www.lynda.com](http://www.lynda.com)
  Each student is required to prepare for labs by reviewing the on-line software modules on Lynda.com prior to attending lab. Students are required to sign up for a monthly subscription to Lynda (25 dollars / month) to access the assigned software tutorials. Limited Lynda subscriptions are available to use on-site at the Digital Union, 3rd floor of the Science and Engineering Library (check the Digital Union website for current hours, which are more limited). Note that Lynda availability is limited to 2 key-codes and may only be used at the Digital Union, which does not have AutoCAD or Rhino installed on their computers. Each assignment will include a selected number of “chapters” to be watched and practiced prior to begin each assignment. Modules will demonstrate how to use each piece of software.

  **It is essential that students prepare for labs by reviewing the modules. This way lab time can be used to answer specific questions and to review, rather than introduce, the software.**

COURSE MATERIALS
Representation Software
The following software packages are available on KSA computers labs 430 and throughout the studio floor.

- **Auto CAD:** In this course, we will use CAD to draw measured sections and other planometrics
- **Rhino:** 3-D modeling software to model complex surfaces
- **Adobe In Design:** Layout software that manages images and texts
- **Adobe Illustrator:** Vector-based drawing software that allows for linework and text. Good for diagrams.
- **Adobe Photoshop:** Raster-based software used for photo manipulation. Good for perspective montages.

Lynda Software Tutorials will be distributed per assignment. Students are encouraged to work ahead and to explore other programs and tutorials available on the site as their curiosity and skills develop.
ATTENDANCE
Students will not be given credit for this course if they accrue three unexcused absences. As a class we will discuss the best way to track attendance and to reward class participation.

Excused Absences: Written verification for excused absences is required. Excused absences are as follows:

• Personal Illness: Please notify the instructor within one week after the period of illness.
• Serious illness or death of a member of the student’s immediate family: Please notify the instructor within one week after the funeral or period of illness.
• Military or Government Duty: Please notify the instructor prior to service.
• Official University trips (sponsored by classes; intercollegiate athletics or other activities). Notice must be given prior to the event.
• Major Religious Holidays: A student must notify the instructor in writing (email is fine) of these dates; please submit to the instructor no later than the last day for adding class (Friday, August 30, 2014).

GRADING
As this course ultimately concerns design concepts and techniques, it will emphasize the fulfillment of a series of interrelated exercises. Grading will be based on the demonstration of a synthetic understanding of computer graphic design skills with particular emphasis on their relationship to architectural knowledge. Final Grades are at the discretion of the instructor. The following will be used as a grading metric:

- Participation 10 points
- Assignment 1: Spatial Scavenger Hunt 5 points
- Assignment 2: Synthesized Section 10 points
- Assignment 3: Isometric Projection 15 points
- Assignment 4: Physical Models 15 points
- Assignment 5: Digital Models 20 points
- Assignment 6: Diagramming Form 10 points
- Assignment 7: Design Portfolio 15 points

The percentage breakdowns above are used as a guide for determining grades. Final grades are at the discretion of the professor. Much like a regular design studio, attendance, work habits and skill development will be considered as a synthetic whole in determination of the grades assigned. The work will be evaluated on its design merits as well as its demonstration of technical skill. The following standard University breakdown will be used in determining final grades.

In order to pass the course:
- You must complete all of the required work
- You must earn a grade of D or higher on all assignments
- Failure to complete any assignment will result in a failing grade (F) for the course

A 93% or higher
A- 90 to 92.9%
B+ 87 to 89.9%
B 83 to 86.9%
B- 80 to 82.9%
C+ 77 to 79.9%
C 73 to 76.9%
C- 70 to 72.9%
D+ 67 to 69.9%
D 63 to 66.9%
D- 60 to 62.9%
F below 60%

Assignment Deadlines
Course assignments are due as noted in the syllabus.
- Students who miss deadlines due to excused absences may submit the required work at a date agreed upon with the instructor.
- Students must be present in class to receive credit for assignments. Students who turn assignments in but do not attend the class will not be given credit for the assignment.
- Unexcused late projects are not accepted, incomplete projects are evaluated in relation to their degree of completion.

Resubmitting Assignments
In order to facilitate synthetic understanding between the lectures, assignments and computer software, students who wish to resubmit drawings for an improved grade may do so within one week of receiving a graded assignment. However, this privilege is dependent upon a students’ participation. For every class a student misses, they relinquish the ability to resubmit an assignment.
ACADEMIC CONDUCT
All members of the class are expected to follow the rules of proper academic conduct as defined in section 3335-31-02 of the university’s legal policies (see below). Academic misconduct includes, but is not limited to, giving or receiving information during an exam and submitting plagiarized work for academic requirements.

Students are encouraged to discuss class concepts and coursework with one another as this furthers understanding and fosters critical thought. However, any work submitted for evaluation must be your own work. The instructor reserves the right to ask you to explain your approach to particular exercises or exam questions. You must be able to verbally demonstrate your understanding of the principles involved and failure to do so may affect your grade.

Any work submitted for evaluation that includes work done by another, copying of another’s work, or the result of following another’s direct guidance is a case of academic misconduct. When academic misconduct is found in any assignment or examination you submit for evaluation it will be reported to the Director of the School and you will receive a zero grade.

Students with Disabilities: If a student requires accommodation for a disability, he or she should immediately arrange an appointment with the professors and the Office for Disability Services. At the appointment, the professors, disability counselors, and student can discuss the course format, anticipate needs and decide upon accommodations. Professors rely on the Office for Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies.

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me to discuss your specific needs. Please contact the Office for Disability Services at 614-292-3307 in room 150 Pomerene Hall to coordinate reasonable accommodations for students with documented disabilities.

Sexual Harassment: O.S.U.’s Sexual Harassment policy, which applies to all faculty, staff, and students, includes lewd remarks and inappropriate comments made in the studio environment, classroom, and computer labs as well as the “display of inappropriate sexually oriented materials in a location where others can see it.” Students can file a complaint by contacting Student Judicial Affairs at 614-292-0748. Sanctions include reprimand, suspension, and dismissal from the University.

HEALTH AND WELLBEING
Students are strongly encouraged to develop healthy working habits and practice managing the stress that comes from college life. Students are always welcome to come speak with the instructor during office hours or GTAs about any personal or professional challenges that may hinder their performance in class.

KSA Student Services is a great resources for helping answer any and all questions about life at the KSA. You can make an appointment to speak with at any time:

Angi Beer, Student Services Manager
(e): beer.38@osu.edu (t): 614-247-7244
Appointments | (t): 614-292-1012 (w): KSAadvising.genbook.com

The University Counseling and Consultation Services: http://www.ccs.ohio-state.edu/
Provide counseling and consultation to currently enrolled undergraduate, graduate and professional students. They also work with spouses/partners of students who are covered by the Comprehensive Student Health Insurance.

Ohio State Police Department: http://www.ps.ohio-state.edu/
OSU has its own Police Department. You can contact them at any time.
To Report an Emergency: from a campus phone, dial 9-1-1
General Non-emergency: 614-292-2121

Buckeye Alerts: http://buckeyealert.osu.edu/
All students should sign up for buckeye alerts to receive text messages in emergency situations.
UNIT 1: ORGANIZING SPACE THROUGH SECTION

Workflow: Observation ➔ Autocad ➔ Illustrator

WEEK ONE
Tuesday, September 2
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

CLASS OVERVIEW
Introductions and course logistics. Presentation of course material and class objectives

Labs A + B / 12:00– 2:05 / KSA Main Space
• Assignment 1: Spatial Scavenger Hunt distributed and discussed
• Lab assignments

Thursday, September 4
Field Work / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430
• Continue work on Assignment 1. Students may use this time for field research.

WEEK TWO
Tuesday, September 9
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

VISUALIZING THICKNESS
Drawing details add physical and spatial thickness to describing volumes. Architecture drawings become dimensional through the evocation of cut, reveal and reference. Line weight and shading techniques are also described as tools for building accuracy as well as atmosphere.
• Presentation and discussion of Assignment 2: Synthesized Sections
• Group discussion: Attendance policy

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430
• Continue work on Assignment 1
• Tools: Auto CAD, Illustrator

Thursday, September 11
Lab / Lab A 10:20–11:50; Lab B 12:00–1:35 / KSA 430
• Assignment 1: Spatial Scavenger Hunt Due. Bring field notebooks to lab
• Tools: Auto CAD, Illustrator

WEEK THREE
Tuesday, September 16
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

REPRESENTING VOLUME
How are volumes described in architectural drawings? Drawing types such as section, axonometric and exploded projection are representation methods used to reveal architecture relationships and spaces.

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430
• Continue work on Assignment 2
• Tools: Auto CAD, Illustrator
Thursday, September 18
Lab / Lab A 10:20–11:50; Lab B 12:00–1:35 / KSA 430
• Continue work on Assignment 2
• Tools: Auto CAD, Illustrator

UNIT 2: EXPANDING SURFACE THROUGH AXONOMETRICS

Workflow: Autocad → Illustrator ↔ Photoshop

WEEK FOUR
Tuesday, September 23
Review / 10:20 – 11:15 / Knowlton School Jury Space

PIN UP: SPATIAL SCAVENGER HUNT / SYNTHESIZED SECTION
Pin up and participatory discussion of work from Assignment 1 + 2: Spatial Scavenger Hunt / Synthesized Section
• Presentation and discussion of Assignment 3: Exploding Axonometric

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430
• Begin work on Assignment 3
• Tools: AutoCAD, Illustrator, Photoshop

Thursday, September 25
Lab / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430
• Continue work on Assignment 3
• Tools: AutoCAD, Illustrator, Photoshop

WEEK FIVE
Tuesday, September 30
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

ISOMETRIC PROJECTIONS
An overview to different types of architectural projections, how spaces are represented and configured through different methods of isometric projection. How do these projection types present architectural ideas different from other types of orthographic projections, or through perspective projection.

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430
• Continue work on Assignment 3
• Tools: AutoCAD, Illustrator, Photoshop

Thursday, October 2
Lab / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430
• Continue work on Assignment 4
• Tools: AutoCAD, Illustrator, Photoshop
UNIT 3: ENVISIONING INHABITATION

Workflow 1: Physical Model → Photography → Photoshop
Workflow 2: Rhino → Photoshop

WEEK SIX

Tuesday, October 7

Review / 10:20 – 11:15 / Knowlton School Jury Space

PIN UP: ISOMETRIC PROJECTIONS

Pin up and participatory discussion of work from Assignment 3: Isometric Projections
- Presentation and discussion of Assignment 4: Physical Modeling

Thursday, October 9

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / 2nd Year Studio Floor
- Physical Modeling Demonstrations
- Continue work on Assignment 4: Physical Models

WEEK SEVEN

Tuesday, October 14

Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

PHOTOGRAPHING YOUR WORK

Guest presentation / Workshop: Phil Arnold, KSA Photographer

Lab / Knowlton Hall, TBA
- Assignment 4: Physical Model Due. Bring models to lab
- Photography Workshop
- Presentation and discussion of Assignment 5: Digital Modeling

Thursday, October 16

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / 2nd Year Studio Floor
- Continue work on Assignment 5
- Tools: Rhino, Photoshop

WEEK EIGHT

Tuesday, October 21

Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

CONSTRUCTING VISION

This lecture looks at how architects use perspective drawing to pursue an atmosphere and sensibility about space, rather than document its physical attributes. Basic rules of 1, 2, and 3, point perspective are presented.

Lab / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430
- Continue work on Assignment 5
- Tools: Rhino, Photoshop
Thursday, October 23  
**Lab** / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430  
• **Optional Lab Day:** day before mid-review. Students may work in lab on their studio mid-review projects.

**WEEK NINE**  
**Tuesday, October 28**  
**Lecture** / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3  
**APPROXIMATING ARCHITECTURE**  
Architectural drawings are about ideas. How does one visualize an architectural evocation when one is uncertain of its physical details? This lecture looks at how architects use perspective drawing to pursue an atmosphere and sensibility about space, rather than document its physical attributes.  
**Lab** / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430  
• Continue work on Assignment 5  
• Tools: Rhino, Photoshop

Thursday, October 30  
**Lab** / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430  
• Continue work on Assignment 5  
• Tools: Rhino, Photoshop

**UNIT 4: DIAGRAMING FORM**  
**Workflow:** Rhino → Illustrator

**WEEK TEN**  
**Tuesday, November 4**  
**Lecture** / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3  
**PIN UP: PHYSICAL AND DIGITAL MODELS**  
Pin up and participatory discussion of work from Assignment 4 and 5: Physical and Digital Models  
Presentation and discussion of Assignment 6: Diagramming Form  
**Lab** / Lab A 12:00–12:55; Lab B 1:10–2:05 / KSA 430  
• Continue work on Assignment 6  
• Tools: Rhino, Illustrator

Thursday, November 6  
**Lab** / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430  
• Continue work on Assignment 6  
• Tools: Rhino, Illustrator
WEEK ELEVEN

Tuesday, November 11
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

ARCHITECTURE DIAGRAMS
How do architects use diagrams to explain their work, and what are the various extents of architectural diagramming. This class will examine not only how diagrams are used to situate decisions, but also how these types of drawings can explain different types of interactions, flows, sequences and structures in the environment.

Lab / Lab A 12:00-12:55; Lab B 1:10-2:05 / KSA 430
• Continue work on Assignment 6
• Tools: Rhino, Illustrator

Thursday, November 13
Lab / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430
• Continue work on Assignment 6
• Tools: Rhino, Illustrator

UNIT 5. SYNTHESIZING INFORMATION
Workflow: Autocad → Rhino → Photoshop → InDesign → Acrobat → Printed Material

WEEK TWELVE

Tuesday, November 18
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

LAYOUTS, GRIDS AND ORGANIZATION
Architects use systems of grids and guides to organize the visual presentation of their work. This lecture will look at an overview of presentation techniques used to structure boards and portfolio pages.

Lab / Lab A 12:00-12:55; Lab B 1:10-2:05 / KSA 430
• Continue work on Assignment 7
• Tools: InDesign

Thursday, November 20
Lab / Lab A 10:20 – 11:50; Lab B 12:00 – 1:35 / KSA 430
• Continue work on Assignment 7
• Tools: InDesign

WEEK FOURTEEN

Tuesday, November 25
Lecture / 10:20 – 11:15 / South Campus Gateway Cinema, Theater 3

PAGE TYPES & TEXT TYPES
Breaking apart the portfolio to look critically at how books are structured and organized. Thinking about how text is used as a system of navigation through the portfolio.

Lab / Lab A 12:00-12:55; Lab B 1:10-2:05 / KSA 430
• Continue work on Assignment 7
• Tools: InDesign
Thursday, November 28
No Class - Thanksgiving

WEEK SIXTEEN
Tuesday, December 2
No Class - Previous day was Studio Final Review

Thursday, December 4
Review / 10:20 – 12:20 / KSA Main Space

PIN UP: DESIGN PORTFOLIO
Final presentation of design work from the first semester.