

ARC 6912 Advanced Topics in Digital Architecture | Fall 2016

Prof. Lucas Najle

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Wednesday 5:30–8:30

Office Hours: Available after class. Contact me to schedule.

“As to methods there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble.”

-Ralph Waldo Emerson

Advanced Digital Principles

There are countless methods that can be used to successfully complete a project. This course will focus on understanding the strengths of a variety of modeling and visualization programs to develop a simple and efficient workflow that maximizes flexibility of the design process.

Course Objectives

All students at the end of this course should demonstrate the abilities to:

- Realize and manage inherent strengths and weaknesses of differing approaches while creatively combining different methods
- Build, manage, and represent highly complex scenes for high-quality renderings and animations
- Model, construct, and represent complex geometries as well as produce analytical drawings of architectural elements
- Understand and work with generative design processes, and apply suitable tools to corresponding situations
- Recognize, appropriate, and deploy the major parametric design paradigms and logics into a project on a variety of scales
- Understand the basic guidelines of preparing files for various portfolio and digital fabrication techniques
- Understand the workflow associated with creating and printing a professional quality portfolio.

Prerequisites

Digital literacy and basic 3D modeling ability is required (ARC2180 or equivalent). All students must have basic experience with 3D modeling, digital image editing and 2D digital drafting. As a fundamental baseline this course assumes basic working knowledge of Autocad, Rhino, and the Adobe Creative Suite (Photoshop, Illustrator, InDesign). Rhino OSX WIP is not suitable, all the plugins we use are Windows only. The latest versions of Grasshopper will only work with Rhino 5.0; buying your own copy of Rhino 5.0 is highly recommended. This will be facilitated through a school bulk purchase. Registration for an A2 Fab Lab account will give access to the Lab's fabrication facilities in Gainesville. (Laser Cutters, 3D Printers, etc.)

Course Content

The course content is divided into 3 components that will all work together to expand your digital toolbox.

1. Advanced Modeling

Introduction to basic mathematics, geometries, and theories of CAD

Advanced Rhino Modeling

Paneling Tools for Rhino

Grasshopper [Parametric Modeling]

GH Plugins: Lunchbox, Ladybug, Kangaroo, Weaverbird

Sub-Division Modeling: T-Splines for Rhino [Organic Modeling Basics]

2. Visualization

Rendering with V-Ray for Rhino and Podium for SketchUp

Scene setup and lighting techniques

Material creation and development

Basic camera and scene animation

Production render queuing / Network Rendering

Post-production and video compositing

Diagramming conceptual Ideas

Cleaning up Line Drawings (Floor plans, elevations, etc.) for presentations

3. Adaptive Workflow

Understanding the basic difference between the types of modeling software

Choosing Vector vs. Raster workflows

Setting up a file for exporting into another software

How to preserve the scale and layers of a file

Importing files between software

Laying out presentation boards

Setting up files for printing / laser cutting

Documenting work in a portfolio format

The course will be conducted in the form of weekly lectures. Each week a new homework assignment will be posted on the class page. Homework assignments will be due the following Wednesday at midnight. This is to allow for any questions to be addressed during the following class meeting before the assignment is due.

Students will also be required to create a Portfolio that will document their class assignments. This portfolio must be created using Adobe InDesign with the Blurb.com plugin for printing purposes. The portfolio should be continually updated each week with new assignments so as to not create a large volume of work at the end of the semester.

Requirements

It is assumed that every student in this seminar will take an active role in ensuring its quality. Students are encouraged to bring their own laptops to class and try to follow the lecture demonstrations, for more direct feedback and understanding of the processes at work. Example files and handouts will be uploaded to the course website prior to class for download.

- Come to class (on time). Attendance is mandatory and will be checked every class. Do the work. Complete each assignment by its due date and scheduled time.
- Do your OWN work. Plagiarism will not be tolerated and will result in a failing grade for the semester (not to mention disciplinary action at the university level).
- Get curious. Take this opportunity to test your own personal boundaries.

Software

It will be beneficial to invest in some of the software for personal use in the long term, since this will be your bread-and-butter far into your academic and professional careers. The majority of the companies offer free or discounted educational licenses. In most cases free trial versions are available for download.

Adobe CC: <https://creative.adobe.com/plans?plan=edu&promoid=KTROQ>

(We will cover Photoshop, Illustrator and InDesign)

Autodesk: <http://www.autodesk.com/education/free-software/all>

SketchUp: <http://www.sketchup.com>

Podium: <http://www.suplugins.com/free-evaluation.php>

Rhino: <http://www.rhino3d.com/>

V-Ray: <http://www.chaosgroup.com/en/2/vrayforrhino.html>

Paneling Tools: <http://wiki.mcneel.com/labs/panelingtools>

Grasshopper: <http://www.grasshopper3d.com/>

Kangaroo: <http://www.grasshopper3d.com/group/kangaroo>

Weaverbird: <http://www.giuliofiorentino.com/weaverbird/>

Ladybug: <http://www.grasshopper3d.com/group/ladybug>

T-Splines: <http://www.tsplines.com/>

Texts and Disks

There is no mandatory text for this class. Handouts and readings will be provided and distributed as PDFs for download prior to class; it is your decision if you want to print them out for reference. As the software and methods are undergoing constant evolution with each new release, a lot of documentation can be found online in the form of tutorials or help forums; there are no standardized methods or texts that apply to all situations. The course is meant to introduce you to the basic fundamental knowledge regarding the conceptual and practical uses of each tool, while further detailed exploration is up to you.

The Course Site will primarily be used for project submissions for grading, and for storage and transportation between computers. You will want to transfer your computer work to a DVD at the end of the semester due to its extended shelf life. Flash drives and

mechanical drives both have a tendency to fail irrecoverably, therefore periodical and redundant backups of your valuable work is highly advised.

Grading

- 30% Digital Portfolio Submission
- 25% Printed Portfolio Submission
- 25% HW Assignments
- 10% Class Participation
- 10% Attendance

Late and /or incomplete work will not be accepted. Attendance and working in lecture and lab is mandatory. Three unexcused absences will result in a full letter grade deduction, while four or more unexcused absences will result in an automatic “E” semester grade. Unexcused late arrival or early departure from the seminar is unacceptable and will automatically count as an absence. Plagiarism will not be tolerated, and will result in a failing grade for the semester.

Grading Scale

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Numeric	100-93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-67	66-63	62-60	59-0
Quality	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0

UF Grading Policy

Information on UF’s grading policy can be found at the following location:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Students with Special Needs

Students with special physical needs and requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. All attempts to provide an equal learning environment for all will be made.

Optional Readings

Each week I will bring relevant books and articles to add to the discussion we are covering in class. These can be referenced in or after class at any time and will not be required to purchase.