Course Information

Number and title: Arch 436 - Advanced Modeling

Instructor info: **Alphonso Peluso**

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Prerequisite(s): DC3 or permission to take the course

Text and Materials: All course resources will be provided on the portal link below:

Tutorials Location: http://www.digiitalarchfab.com/arch-436-advanced-modeling-fall-2023/

Course description:

This course will focus on 3D modeling of complex geometric components in Architecture and design. Concepts explored will concentrate on the advancement of digital design as an iterative process. Various modeling types covered are: Parametric Modeling, Generative Modeling, Responsive Modeling and Form Finding.

Goals:

Develop an in-depth understanding of NURBS Modeling

Use architectural and structural texts as a guide/aid for learning complex 3D modeling.

Create complex parametric models based on text book concepts

Establish a deeper understanding of parametric modeling from the Midterm, Final and weekly assignment process and completion

Create form found parametric models

Develop a better understanding of the link between Virtual and Physical

Software:

Rhino	http://www.rhino3d.com/
Grasshopper	http://www.grasshopper3d.com/
Paneling tools	http://www.grasshopper3d.com/group/panelingtools
Kangaroo2	http://www.grasshopper3d.com/group/kangaroo
Weaverbird	http://www.giuliopiacentino.com/weaverbird/
Mesh +	http://www.grasshopper3d.com/group/mesh
Biomorpher	https://www.food4rhino.com/app/biomorpher
Chromodoris	https://www.food4rhino.com/en/app/chromodoris
Stella 3D	https://www.food4rhino.com/en/app/stella3d
Dendro	https://www.food4rhino.com/en/app/dendro
Intralattice	https://www.food4rhino.com/en/app/intralattice
Pufferfish	https://www.food4rhino.com/en/app/pufferfish

Students with Disabilities Statement:

Americans with Disabilities Act (ADA) Policy Statement

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must go through the Center for Disability Resources office. The Center for Disability Resources (CDR) is located at 3424 S. State Street, Suite 1C3-2, Chicago, IL 60616 telephone 312 567.5744 or disabilities@iit.edu.

Reading List:

Parametric Architecture with Grasshopper: Primer by Arturo Tedeschi

AAD: Algorithims Aided Design by Arturo Tedeschi

Grading: Students will submit 9 Homework assignments, Midterm, and Final

Final grade is based on the four percentages below:

10% for attendance
(attendance is mandatory, signing in for someone and/or 3 unexcused absences will result in a failing grade)

20% for Homework assignments

30% for Midterm

40% for the Final

Please note: attendance**,** completion and submission of all course work on time is the minimum requirement and does not mean that you will receive an A grade. All grades are subject to the grade judging criteria below:

Grades are determined by judging 4 different categories:

Legibility - Make sure that your assignments are clear and easy to read. Use spell check (all software apps have it). Your shared folder should be neat and organized with assignment #'s labeled **Firstname_Lastname_A0#**.

Composition - In addition to being legible you should apply all the concepts of composition that you have previously learned. Some suggestions including but not limited to are: all line drawings must demonstrate good line weights, assignments should include title and drawing names, all text should be placed with good layout & scale.

Innovation - Expand upon the skill sets taught in the course and apply them to the assignments. Research additional learning resources found on the Internet and in Libraries. Create your own way to apply the software tools and concepts discussed in the course.

Originality - Assignments will weigh heavily on *Originality*. Strive to satisfy the requirements of the assignments with creative and original solutions

Class Schedule

Week One:
August 24
Introduction _ Interface _ Geometry Types _ Nurbs
What is Rhino Grasshopper 3D?
What Is Grasshopper Good For?

Week Two:
August 31
Build a Strong Foundation in Grasshopper
Generating Multiple Values
(Series) _ (Range) _ (Domain) _ (Random)
(Graph Mapper)
Generative Components
(Iso Trim) _ (Divide Domain 2) _ (Morph Box)
(Surface Box)

Week Three:
September 07
Rhino 3D and Grasshopper 3D Surface Manipulation
Parametric Case Study -UnStudio Burnham Pavilion
Paneling Tools 2.5D
Paneling Tools 3D

Week Four:
September 14
Paneling Tools Effects _ Data Trees #01
Point Attractor, Curve Attractor, Srf Curvature Attract
Intro To Galapagos Evolutionary Solver

Midterm Assignment posted

Week Five:
September 21
Parametric Form Finding 01 _ (Kangaroo)
ShellStar Pavilion by Matsys
Galapagos Evolutionary Solver

Week Six:
September 28
Parametric Form Finding 02 _ (Kangaroo)
Munich Olympic Stadium - Frei Otto
Icosahedron _ Pressure _ Weaverbird Plug-in

Week Seven:
October 05
Parametric Form Finding 03 _ (Kangaroo)
Minimal Surfaces _ Collision

Week Eight:
October 12
Work in Class

Week Nine:
October 19
MIDTERM PRESENTATION
3D PRINT PRESENTATION

Week Ten:
October 26
Parametric Evolutionary Solver _ (BioMorpher)
Parametric Mesh Subdivision _ (Mesh +)

Week Eleven:
November 02
Parametric Voxel Modeling _ (Chromodoris)
Parametric Mesh Modeling _ (Pufferfish)
Final Assignment posted

Week Twelve:
November 09
Parametric Mesh Modeling _ (Stella 3D)
Parametric Mesh Modeling _ (Dendro)

Week Thirteen:
November 16
Parametric Mesh Modeling _ (Intralattice)

Week Fourteen:
November 23
Work in Class

Week Fifteen:
November 30
Work in Class

Finals Week:
December 07
FINAL PRESENTATION
3D PRINT PRESENTATION

*note: course syllabus & schedule are subject to change