Arch 490 - 04_ Intro to Parametric Modeling _ Fall 2023 _ Professor: Alphonso Peluso

Number and title: Arch 490 - 04 - Intro to Parametric Modeling

Professor: **Alphonso Peluso**

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Prerequisite(s): **Arch 108 / 507** DC2 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-490-intro-to-parametric-modeling-fall-2023/**

Course description:

This course will serve as an Introduction to Parametric Modeling. The course will use architectural and structural texts as a guide/aid for learning complex Parametric Modeling. It will explore a series of Parametric structural design case studies. Case studies explored are Folded Plate Tessellations, Shell Structure Tessellations, Grid Shells, Tall Buildings, Responsive Components, and Generative Components. Students will propose and create their own Parametric designs.

Goals:

- Continue to develop an in-depth understanding of NURBS 3D Computer 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 computer modeling through the Midterm, Final and weekly assignment process and completion.

Software:

Rhino	http://www.rhino3d.com/
Grasshopper	http://www.grasshopper3d.com/
Weaverbird	http://www.giuliopiacentino.com/weaverbird/
Lunchbox	http://www.food4rhino.com/project/lunchbox
Parakeet	https://www.food4rhino.com/en/app/parakeet
Photoshop	https://www.adobe.com/products/photoshop.html
InDesign	https://www.adobe.com/products/indesign.html

Reading List:

The Function of Form by Farshid Moussavi

Tragsysteme = Structure Systems by Heino Engel

Architectural Geometry by Portmann, Asperl, Hofer, Kilian

Parametric Architecture with Grasshopper: Primer by Arturo Tedeschi

AAD: Algorithims Aided Design by Arturo Tedeschi

Grading: Students will submit multiple homework assignments, a Midterm, and a Final

The 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 drive should be neat and organized with assignment #'s labeled.

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 - Midterm and Final grades will weigh heavily on *Originality*. Strive to satisfy the requirements of the midterm and final assignments with creative and original solutions

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16 Class Schedule ******Please note the following schedule is subject to change, it represents what will be covered for homework by students independently outside of class. In-class instruction may differ from what is listed below******

Class One: Parametric Folded Plate Tessellation (Grasshopper)
August 22 Parametric Case Study 01
Air Force Academy Chapel by Skidmore, Owings, Merrill

Class Two: Parametric Shell Structure Tessellation (Grasshopper)
August 29 Parametric Case Study 02
Los Manantiales by Felix Candela

Class Three: Working with Lists (Grasshopper)
September 05 Parametric Case Study 03
Palazetto Dello Sport by Pier Luigi Nervi

Class Four: Parametric Tower (Data Trees)
September 12 Parametric Case Study 04
Absolute Towers by MAD Architects

Class Five: Shark Gill (Data Trees)
September 19 Parametric Case Study 05
10 Hills Place by Amanda Levete Architects

Class Six: Mesh Subdivision and Smoothing
September 26 Parametric Case Study 06
Grand Musee de l'Afrique by UN Studio _ (Responsive) (Weaverbird)

Class Seven: **Work in Class preparation for Midterm Presentation**
October 03

Class Eight: **Midterm Presentation**
October 10

Class Nine: Responsive Components _ (Grasshopper)
October 17 Parametric Case Study 07
Arab Institute by Jean Nouvel _ (Responsive) (Remap)

Class Ten: Generative Components _ (Grasshopper)
October 24 Parametric Case Study 08
Al Bahar Towers by Aedas (Box Morph)

Class Eleven: Paneling Tools _ (Lunchbox)
October 31 Parametric Case Study 09
Museo Soumaya by Fernando Romero

Class Twelve: Attractors _ (Grasshopper)
November 07 Parametric Case Study 10
Yas Hotel by Asymptote Architecture

Class Thirteen: Surface Patterns _ (Parakeet)
November 14 Parametric Case Study 11
The Future by TBD

Class Fourteen: **Work in Class preparation for Final Presentation**
November 21

Class Fifteen: **No Class - Studio Finals**
November 28

Class Sixteen: **Final Presentation**
Finals Week Date TBD