

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

**Professor:** **Alphonso Peluso**

**E-Mail:** [peluso@iit.edu](mailto:peluso@iit.edu)

**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-490-04-intro-to-parametric-modeling-fall-2024/>

### 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	<a href="http://www.rhino3d.com/">http://www.rhino3d.com/</a>
Grasshopper	<a href="http://www.grasshopper3d.com/">http://www.grasshopper3d.com/</a>
Weaverbird	<a href="http://www.giuliopiacentino.com/weaverbird/">http://www.giuliopiacentino.com/weaverbird/</a>
Lunchbox	<a href="http://www.food4rhino.com/project/lunchbox">http://www.food4rhino.com/project/lunchbox</a>
Parakeet	<a href="https://www.food4rhino.com/en/app/parakeet">https://www.food4rhino.com/en/app/parakeet</a>

### Reading List:

**Intro to Parametric Modeling** EBook by Alphonso Peluso Amazon: [Link](#) Apple: [Link](#)

**The Function of Form** by Farshid Moussavi

**Tragsysteme = Structure Systems** by Heino Engel

**Parametric Architecture with Grasshopper: Primer** by Arturo Tedeschi

**AAD: Algorithms 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 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** - 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

### 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](mailto:disabilities@iit.edu).

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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:** **Work in Class preparation for Midterm Presentation**  
October 10

**Class Nine:** **Midterm Presentation**  
October 17

**Class Ten:** Responsive Components \_ ( Grasshopper )  
October 24 Parametric Case Study 07  
Arab Institute by Jean Nouvel \_ ( Responsive ) ( Remap )

**Class Eleven:** Generative Components \_ ( Grasshopper )  
October 31 Attractors \_ ( Grasshopper )  
Parametric Case Study 08  
Al Bahar Towers by Aedas ( Box Morph )

**Class Twelve:** Surface Patterns \_ ( Parakeet )  
November 07 Parametric Case Study 09  
Neri Oxman  
Paneling Tools \_ Structure ( Lunchbox )  
Parametric Case Study 10  
Museo Soumaya by Fernando Romero

**Class Thirteen:** **Work in Class on Final Presentation**  
November 14

**Class Fourteen:** **Work in Class on Final Presentation**  
November 21 Start 3D Print

**Class Fifteen:** **Work in Class on Final Presentation**  
November 28

**Class Sixteen:** **Final Presentation**  
Finals Week Date: December 05