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: **https://www.digiitalarchfab.com/arch-490-04-intro-to-parametric-modeling-fall-2025/**

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.

Learning Objectives:

1. Demonstrate proficiency in NURBS-based 3D modeling by applying advanced parametric techniques to architectural and structural forms.

2. Interpret and translate architectural and structural texts into complex parametric models, using these sources as design and problem-solving references.

3. Develop and execute case study models including folded plate tessellations, shell structures, grid shells, tall buildings, and responsive/generative components—demonstrating an understanding of their geometric and structural principles.

4. Design and present original parametric projects that integrate conceptual thinking, technical skills, and iterative refinement through weekly assignments, midterm, and final deliverables

Software: Rhino   http://www.rhino3d.com/
                      Grasshopper   http://www.grasshopper3d.com/
                      Lunchbox   http://www.food4rhino.com/project/lunchbox
                      Weaverbird   http://www.giuliopiacentino.com/weaverbird/

Reading List:

Intro to Parametric Modeling EBook by Alphonso Peluso   Amazon: Link   Apple: Link

Advanced Parametric Modeling EBook by Alphonso Peluso   Amazon: Link   Apple: Link

The Function of Form by Farshid Moussavi

Tragsysteme = Structure Systems by Heino Engel

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

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 in Life Sciences Room 218, telephone 312.567.5744 or https://www.iit.edu/cdr

Academic Resource Center (ARC): Hermann Hall for help with study or language skills. http://iit.edu/arc/

IIT Writing Center: One-to-one help with writing assignments. https://www.iit.edu/cac/writing-guides/help-writing-assignments

Student Health and Wellness Center: provides health care, advocacy, wellness resources https://www.iit.edu/shwc

Therapy/Psychiatric Counseling: https://www.iit.edu/shwc/appointments/counseling-appointments

Center for Disability Resources: https://www.iit.edu/cdr

Code of Academic Honesty: https://web.iit.edu/student-affairs/handbook/fine-print/code-academic-honesty

Student Code of Conduct: https://webmaster.iit.edu/files/general-counsel/faculty-handbook/code_of_conduct.pdf

Studio Culture: https://arch.iit.edu/about/studio-culture

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17 Week 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***

Week One:
August 19
Parametric Folded Plate Tessellation (Grasshopper)
Parametric Case Study 01
Air Force Academy Chapel by Skidmore, Owings, Merrill

Week Two:
August 26
Parametric Shell Structure Tessellation (Grasshopper)
Parametric Case Study 02
Los Manantiales by Felix Candela

Week Three:
September 02
Working with Lists (Grasshopper)
Parametric Case Study 03
Palazetto Dello Sport by Pier Luigi Nervi

Week Four:
September 09
Parametric Tower (Data Trees)
Parametric Case Study 04
Absolute Towers by MAD Architects

Week Five:
September 16
3D Printing Basics _ Prusa Slicer
IIT Fabrication Center 3D Printing Authorization

Week Six:
September 23
Work in Class preparation for Midterm Presentation

Week Seven:
September 30
Work in Class preparation for Midterm Presentation

Week Eight:
October 07
Midterm Presentation

Week Nine:
October 14
No Class Fall Break

Week Ten:
October 21
Shark Gill (Data Trees)
Parametric Case Study 05
10 Hills Place by Amanda Levete Architects

Week Eleven:
October 28
Mesh Subdivision and Smoothing
Parametric Case Study 06
Grand Musee de l'Afrique by UN Studio _ (Responsive) (Weaverbird)

Week Twelve:
November 04
Responsive Components _ (Grasshopper)
Attractors _ (Grasshopper)
Parametric Case Study 07
Arab Institute by Jean Nouvel _ (Responsive) (Remap)

Week Thirteen: **Work in Class on Final Presentation**
November 11

Week Fourteen: **Work in Class on Final Presentation**
November 18
Start 3D Print

Week Fifteen: **Work in Class on Final Presentation**
November 25

Week Sixteen: **No Class**
December 02

Week Seventeen: **Final Presentation**
Finals Week Date: December 09