



TEACHING PLAN

1. IDENTIFICATION

Subject	Parametric Design (undergraduate level)								
Institution	Faculty of Architecture, Urban Planning and Design (FAUED)								
Code	FAUED39037F	Semester	-			Class	A		
Course Hours						Type			
Theory	15	Practice	15	Total	30	Compulsory		Optional	x
Professor	André Luís de Araujo								
Notes	Form-based Information Lab: www.informa3d.xyz The Informa3D in one minute: https://www.youtube.com/watch?v=cs1OAI0Wabo								

2. SUMMARY

Principles of computer modeling. Parametric modeling. Algorithmic definitions. Computer-Aided Manufacturing. Digital fabrication.

3. ABOUT

Exploring various alternatives virtually instantaneously has been one of the most obvious trends in recent years in the field of computer design. The term parametric design has been used in this context to refer to design strategies that use methods for generating alternatives rather than designing a single element. These methods involve algorithmic procedures that make it possible to establish a correspondence between form and information to produce and control geometries. Currently, contemporary architects and designers are looking for solutions of this type, generating many design solutions during preliminary studies. In this course, these strategies will be introduced with the aim of improving the cognitive skills that enable students to transfer forms and information from the physical and ideological universes to the computer, expanding their manipulative capacity. To this end, it is necessary to present several classes and functions common to CAD applications, with a view to exploring them in essentially creative contexts. To develop these skills, it is proposed to use teaching strategies that promote situations in which obtaining, processing, and generating information are directed towards the investigation of form through inputs and outputs. In this way, the aim is to articulate the elements of the architectural universe in processes that enable the student to navigate in a qualified manner between the tools presented by this course.

4. GOALS

Overall:

Developing skills in designing products assisted by computer modeling.

Specific aims:

- Develop modeling strategies using Non-Rational Uniform Basis Spline (NURBS) technology and manipulate three-dimensional shapes efficiently.
- Link shapes and information (textual and numerical) using graphic programming languages in visual scripts.
- Simulate and optimize the production of geometric shapes according to objective functions.

5. PROGRAM

The program is based on the development of parametric modeling strategies and their use in the design process of some products (Table 1).

Table 1: Course schedule.

Lesson	Planned dates	Subject
#1	Aug, 7	Software installation and fundamental programming concepts
#2	Aug, 14	Introduction to lists and data trees
#3	Aug, 21	Algorithmic instruction 1: panels extruded from a surface *TP
#4	Aug, 28	Algorithmic instruction 2: paneling complex surfaces *TP
#5	Sep, 4	Algorithmic instruction 3: canopy like waffles *TP
#6	Sep, 11	Final design 1: parametric design
#7	Sep, 18	Final design 2: digital manufacturing *FD
#8	Sep, 25	Pitch: final presentations

Notes: TP: Touch Point. FD: Final Design. See item 7. Assessments.

6. TEACHING METHODS

The teaching strategies to be used will seek to facilitate the learning process in a way that is compatible with the time available. We propose using teaching resources such as explanatory videos and tutorials. Software will be used as a graphical interface for learning, based on weekly practical and theoretical lectures, as well as individual and group practical's, with the teacher supervision, preferably carried out in the classroom.

7. ASSESSMENTS

Table 2: Tasks and scores.

Touch points: Exercises done individually with the teacher's help and handed in at the end of the lesson	40%
Final design: Exercises done in groups with the teacher's advice and handed in at the end of the course	60%
Make-up exam: Redoing the final design individually	60%

8. BIBLIOGRAPHY

Basics:

- [1] HIGHT, Chistopher & PERRY, Collective intelligence in design. 2006.
- [2] HADID, Zaha El croquis. n. 52 Zaha Hadid 1983 2004. 2004.
- [3] LIBESKIND El croquis; n.80 Daniel Lideskind 87/96.
- [4] MEREDITH, Michael. From control to design: parametric/algorithmic architecture. 2008.

Complementary:

- [5] TEDESCHI A. AAD Algorithms-Aided Design: Parametric Strategies using Grasshopper. Napoli: Le Penseur, 2014.
- [6] BURRY,J.; BURRY,M. The New Mathematics of Architecture. Melbourne: Thames & Hudson, 2012.
- [7] KOLAREVIC, B. Architecture in the Digital Age. New York: Spon Press, 2003.
- [8] POTTMANN,H. Architectural geometry and fabrication - aware design. Nexus: Relationships Between Architecture and Mathematics, v.15, n.2, p.195-208, abr.2013.