UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO
FACULTAD DE ARQUITECTURA

DEGREE IN ARCHITECTURE

Course program
Parametric Design

Course number	**Semester** 6° a 10°	**Credits** 4	**Phase**	**Consolidación y Síntesis**
			Area	**Proyecto**
Modality	**Class (X) Workshop (X) Laboratory ( ) Seminar( )**		**Type**	**T ( ) P ( ) T/P (X)**
Character	**Obligatory ( ) Obligatory E ( )** **Elective ( ) Elective E (X)**		**Hours**	

	Week		**Semester**	
Theoretical	**2**	**Theoretical**	**16**
Practices	**2**	**Practices**	**16**
Total	**4**	**Total**	**32**

Professional Interest Line
Proceso proyectual

Course Sequence

None ( )

Obligatory ( )

Preceding course	
Subsequent course	

Recommended (x)

Preceding course	Basic knowledge of Rhino (optional but strongly recommended). Intermediate to advanced English proficiency.
Subsequent course	

General objective

Through the theoretical and practical study of parametric design, students will develop an interdisciplinary understanding of design processes, analysis, simulation, representation and fabrication of design prototypes.

Specific objectives
The students will:
_identify theoretical principles of parametric design in industrial design and architecture.

_develop parametric thinking and approaches towards representing their design intentions diagrammatically.

_learn to use modeling tools (Rhino + Grasshopper + analysis and simulation plugins) and digital fabrication tools (laser cutter, 3D printers, etc.) in a critical manner.

_expand their reading, written and oral comprehension and expression in English in the communication of their design and in the exploration of international research relating to computer-aided design.

	Course Units	**Number of hours**	
		Theory	**Practice**
1	Theory behind parametric design and the use of digital fabrication tools in Industrial Design and Architecture.	**8**	
2	Design, development and communication of parametric design concepts and intentions.	**4**	**4**
3	Parametric processes in digital fabrication.	**4**	**4**

4	Parametric simulation and analysis.		**4**
5	Representation of design processes in diagram, photography and drawing.		**4**
	Total	**16**	**16**
	Total number of hours	**32**	

Unit contents	
Units	**Subtopics**
1	Oral and written expression and reflection in English
2	Work through design iterations and formulate design concepts.
3	Parametric workflow in digital fabrication.
4	Parametric simulation and analysis.
5	Representation of design processes through diagram, photography and drawing.

Didactic strategies		**Learning evaluation**	
Class presentations	■	Quizzes	
Team work project	■	Final test	
Readings	■	Homework and projects	■
Research project		Theme presentation in class	
Practices (workshop or laboratory)	■	Participation in class	■
Field work		Class attendance	
Project-based learning	■	Evaluation by rubrics	
Problem-based learning		Portfolios	■
Case studies	■	Abilities checklist	
Other (specify)		Other (specify)	

Professional profile	
Academic degree	Master´s degree in Architecture or Industrial Design
Academic experience	Certifications in pedagogy and continued education. Proficient in software and digital fabrication.
Others	Proficient in English and Spanish. Professional experience.

Basic bibliography

Beorkrem, Christopher, 2002, *Material Strategies in Digital Fabrication*. Routledge
Iwamoto, Lisa, 2013, *Digital Fabrications: Architectural and Material Techniques*. Princeton Architectural Press.
Lynn, Greg, 2011. *Animate Form*. Princeton Architectural Press.
Lynn, Greg, 2004. *Folding in Architecture*, Wiley-Academy
Payne, A. and R. Issa, 2009, *Grasshopper Manual*.
Picon, Antoine, 2010, *Digital Culture in Architecture: an Introduction for the Design Professions*, Birkhauser.

Surname, initial name, year of publication, title in italics, publisher, country

Complementary bibliography

Carpo, Mario, 2011, *The Alphabet and the Algorithm*. MIT Press.
Carpo, Mario, 2017, *The Second Digital turn: Design beyond Intelligence*. The MIT Press
Huges, Francesca, 2014, *The Architecture of Error: Matter, Measure, and the Misadventures of Precision*. The MIT Press.

Surname, initial name, year of publication, title in italics, publisher, country