International Summer Workshop

Modelmaking in the Digital Age - Module B

From craftsmanship to automated production - Towards Sustainable Making

Santander, Spain

Atelier La Juntana

Architecture Official College of Cantabria

Polytechnic University of Madrid

CRAFTMANSHIP AND DIGITAL TECHNOLOGY | ART OF MAKING

'Making is the most powerful way that we solve problems, express ideas and shape our world. What and how we make defines who we are, and communicates who we want to be.'

Daniel Charny

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Fig. 1: Model of a tower at 1:1000 scale designed during the MMDA-14 workshop.

Fig. 2: Participants of the workshop preparing sand moulds for the aluminum casting exercice.

Fig. 3: International shared lunch with participants of the first edition of the workshop, MMDA-14

Society teaches us how to use a product, education instructs us on how to design it, and our imagination pushes us to innovate, but who teaches us how to manufacture? What does making involve in the twenty-first century? What is the meaning of craftsmanship in the Digital Age?

The Model as a Key Part of the Design Process

Far from being overshadowed by the digital era, physical models reclaim, today more than ever, their place as a key element during the design process: from urban to interior design, public consultations and exhibitions, and even for interaction with the visually impaired. Utilised throughout all the phases of the design, from the early stages to final 1:1 scale mock-ups, physical models help us to visualise ideas, explain concepts, foresee problems and investigate solutions. Understood as an element on the borderline between craftsmanship and digital production, architectural models combine art and technical skills, reaching a result which is not a mere reproduction of the idea, but a unique creation itself.

This workshop is an introduction to the world of Model Making, embracing its different applications, scales, materials and techniques, while encouraging the research and discovery of new ways of making and representing the architectural model through a combination of fine arts and digital production.

Craftsmanship of the Digital Object

The impact of an information society, presumably dehumanised, makes us reconsider the role of craftsmanship as a human action. To what extent can the process of making help us confront the lack of identity and increasing dehumanisation of modern production? In the Digital Era, the everyday object is masked behind a technological veil, which places the product in a world foreign to our own, transforming the object into a standardised catalogue option to be used and discarded without us being part of the making process.

To preserve the essence of objects, it seems necessary to understand the process behind them. It is learning from this process, and not the end result, which provides us with the necessary tools to comprehend the “why” and “how” of production techniques, allowing us to choose, recreate and improve the learnt method in our future practice.

Workshop Method

The course is taught across a series of short exercises combining theory and practice, through which students are challenged to solve a given brief by means of making.

Varying in scale and duration, the exercises will be conducted through direct experimentation and manufacturing, and will include techniques such as embossing, etching, carving, moulding, and casting, making the students aware of the production time and process.

Workshop Objectives

- Students will acquire a comprehensive understanding of different making techniques related to the architectural representation and design process, allowing them to produce a set of outstanding architectural models, mock-ups and prototypes.
- Students will demonstrate the ability to master the making process through direct experimentation with the material and the craft, enabling a sensorial experience through direct contact with materials, tools and handling.
- Students will be understand to connect the process of architecture with digital design and automated production and to explore the border between architecture, fine arts and product design, while encouraging work in the overlapping areas
- Students will demonstrate the ability to work in groups and to exchange ideas and experiences in an open-minded research environment.

Modelmaking in the Digital Age
Atelier La Juntana, in collaboration with the Architecture Official College of Cantabria and the Polytechnic University of Madrid, organises the summer workshop 'Model Making in the Digital Age' for architects (both students and professionals) , designers and people willing to investigate and discover different techniques and materials, while developing an model. The workshop will particularly observe the relationship between traditional craft and digital design.
Led by architects Armor and Nertos Gutiérrez Rivas, along with interdisciplinary artist Daniel Gutiérrez Adán, the workshop takes place at Atelier La Juntana, located in Santander. Both beginners with little prior experience and those with specific professional interests are invited to participate.

The workshop is a full-time course, starting at 09.30am and finishing at 5.30pm each day, with a total of 56 learning hours. Each participant will have his or her own working space; access to Wi-Fi and the library, printer and plotter; a resting area in the garden; and access to a small kitchen. Accommodation in the surroundings of the workshop can also be provided upon request.

The course is recognised by the Polytechnic Architecture University of Madrid as part of the University Programme, and students are granted 2 ECTS (European Credit Transfer and Accumulation System) upon completion.

Fig. 4: Part of the work developed during the first workshop edition, MMDA-14.

About the workshop
Facilities and equipment

Fig. 5: Workshop, interior view.

Fig. 6: Workshop and apartment, view from the garden.

The Workshop space is separated into three different areas: the working space, where all the handling equipment is located; the research area, with access to computers, Wi-Fi and the library; and the resting area, with sleeping and cooking facilities. In addition, certain activities take place in the garden surrounding the Workshop.

Throughout the course, the equipment and materials are always available to participants. Use of machinery is subject to previous induction, and health and safety measures are fundamental to the use of the Workshop.

The Workshop facilities include:

-Carpentry and wood workshop
-Ceramic, clay and plaster workshop
-Slip casting workshop
-Metal melting and casting workshop
-Mould-making and resin-casting workshop
-Photography and cyanotype workshop
-Engraving and press printing workshop
-Glass workshop
-Vacuum-forming workshop
-Laser cutting studio
-3d printing studio

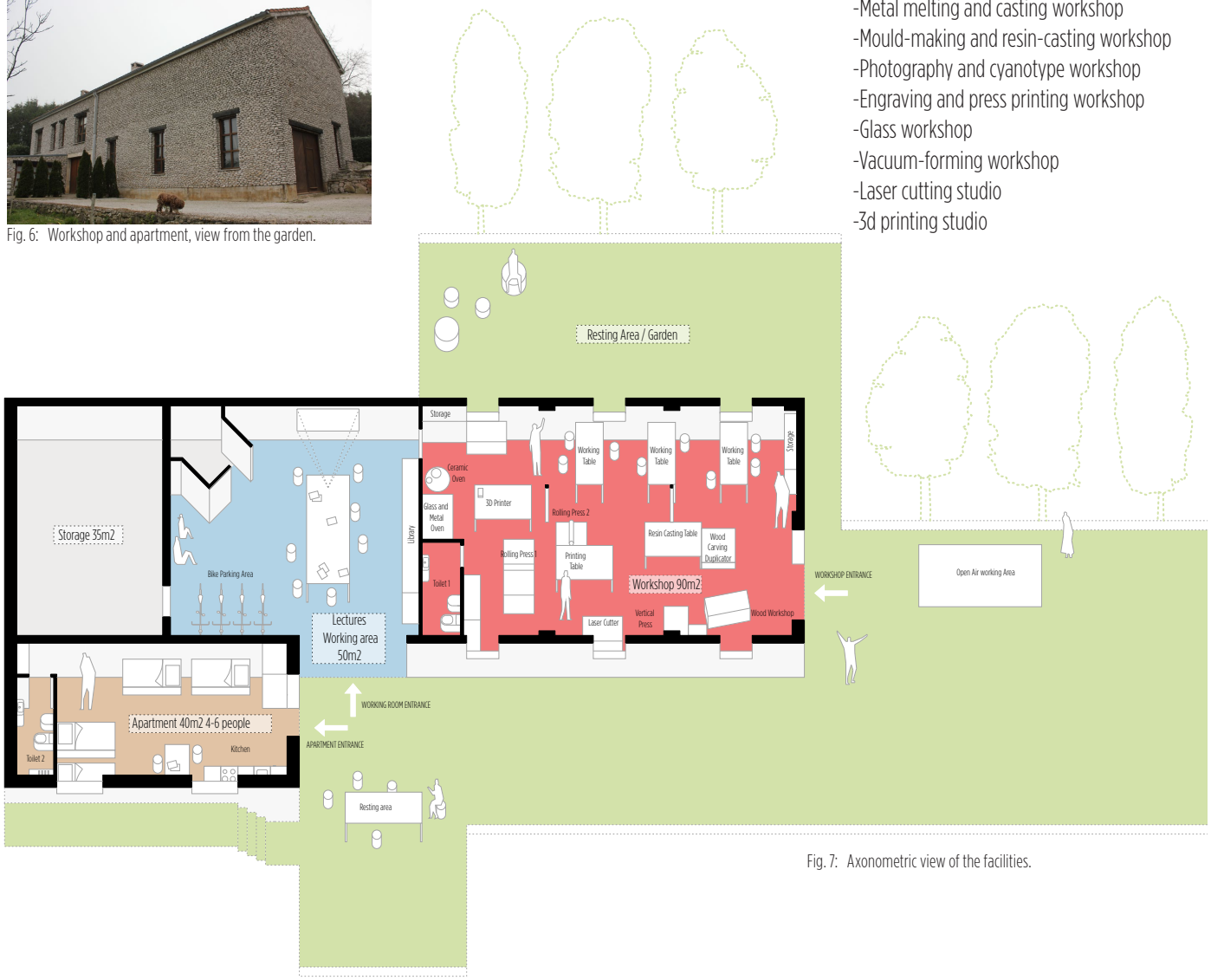


Fig. 7: Axonometric view of the facilities.


Fig. 8: Wood carving duplicator.


Fig. 9: Carpentry table saw.

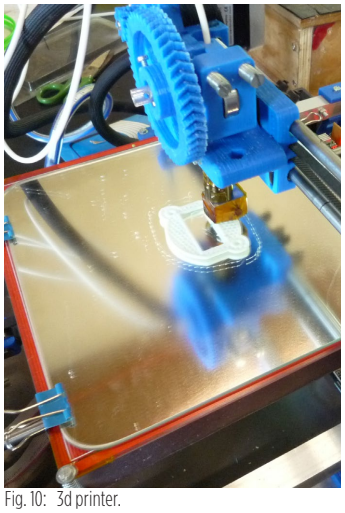


Fig. 10: 3d printer.


Fig. 11: Ceramic oven.


Fig. 12: Aluminum melting oven


Fig. 13: Printing press.

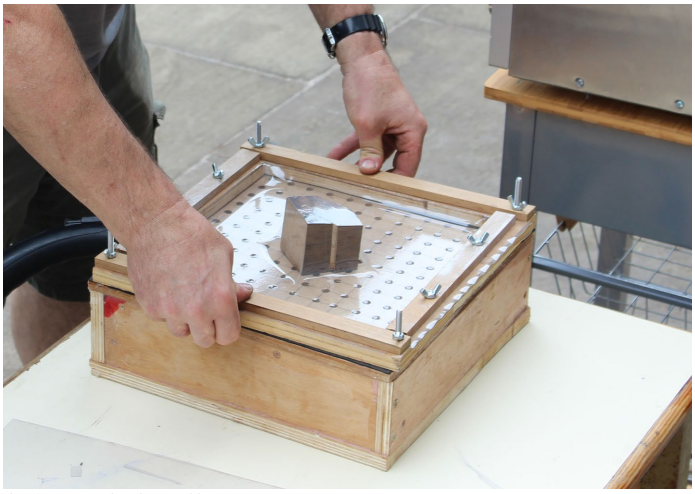


Fig. 14: Vacuum forming machine.

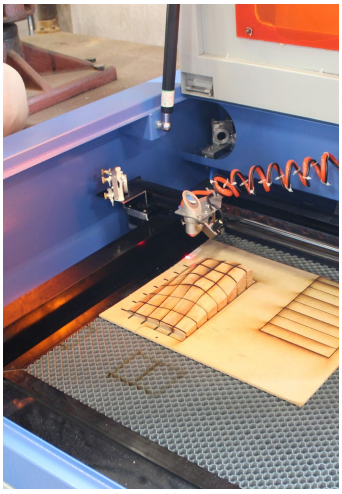


Fig. 15: Laser cutting machine.


Fig. 16: Cianotype UV Light box.

Fig. 17: Aerial image of the workshop´s surroundings, including Quebrada Coast area, Dunas de Liencres Natural Park and Picota Hill.

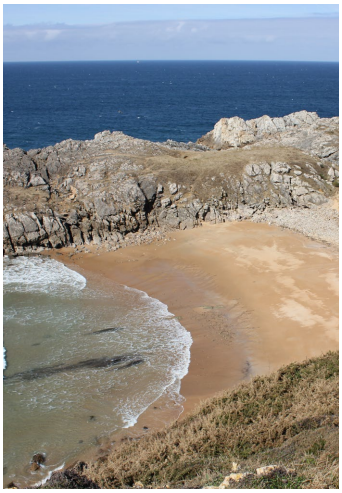


Fig. 18: Somocuevas beach.

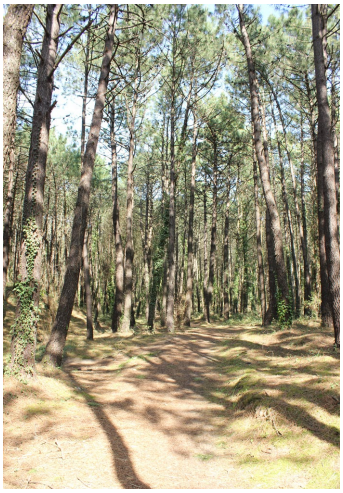


Fig. 19: Dunas de Liencres Forest.

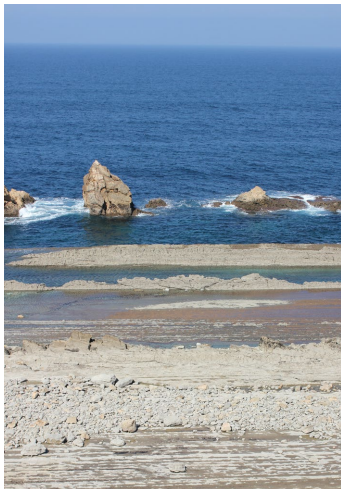


Fig. 20: Quebrada Coast protected area.

Fig. 21: River Pas estuary.

Dunas de Liencres Natural Park, Quebrada Coast and Picota Hill.

The Workshop takes advantage of its unique location at the centre of Dunas de Liencres Natural Park, the largest protected natural area on the north coast of Spain. A mix of green and blue landscapes, it has five different beaches located within 10 minutes' walking distance of the Workshop: Somocuevas, Valdearenas, Canallave, La Arnía and El Madero. The River Pas estuary, the Liencres Pine Tree forest, the Quebrada Coast area and the Picota Hill area are also located within the Natural Park, all within walking distance. In the evenings, different activities and trips provide the opportunity to discover this special location.

In parallel, part of the Workshop exercises take part in the surrounding areas, using materials collected from the forest and beaches and through direct interaction with the landscape.


Fig. 22: Practising Yoga in the garden.


Fig. 23: Workshop induction.


Fig. 24: Explanation of previous work by Atelier La Juntana.


Fig. 25: Horse Riding in the Natural Park of the Liencres Dunes (not included in the workshop fee)


Fig. 26: Surfing courses in Liencres beach (not included in the workshop fee)


Fig. 27: Trip to Somocuevas beach with tutors and participants


Fig. 28: Open doors day

"The relaxed and family atmosphere which makes the entire experience easy to enjoy"

"Excelent ambience and staff, an unbeatable learning experience"

"To experience everything from the first hand. Real working with real materials"

Techniques covered in the Module B

01 **Column Re-invented: Cutting-Edge Ceramics – Slip Casting**
Plaster sculpting workshop
Multi-part plaster moulds for slip casting
Ceramic Slip casting and dipping glazing

02 **Designing a Pavilion: Complex Geometries & Fiber + Bio Resins**
Silicone molds for complex fiberglass sculpting
Bee-wax, paraffin, and pine tree resin casting

03 **Void Intersection: Bronze Lost Wax Casting**
Wax sculpting workshop
Lost wax bronze casting and patina

04 **Woodcut & Press Printing Workshop**

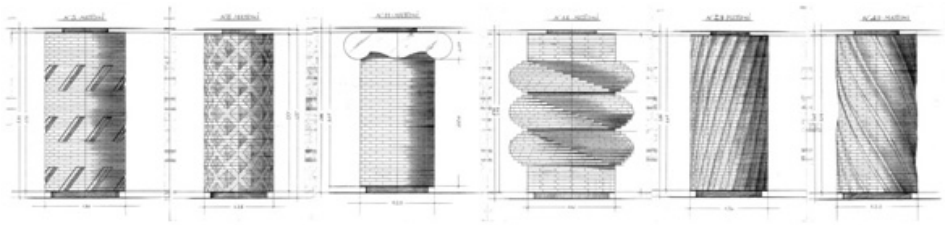
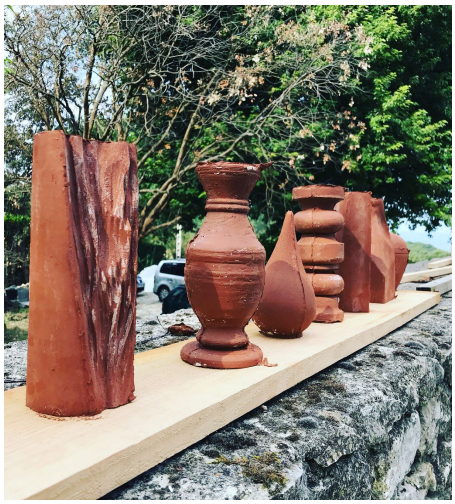


Fig. 29: Alhondiga Columns, Philippe Starck, Bilbao



Exercise Information

Individual / Group work:
Individual
Mini Brief:
Column Re-invented
Workshop involved:
Ceramics / Plaster / Clay / Glazing
Duration:
6+2 hours
Connection with the next exercise:
Yes - Ceramic Glazing
Scale:
1:10

Mini Brief

Participants will be asked to rethink the concept and geometry of the architectural column, using as a reference the collection of columns-sculptures used by Philippe Starck for the Alhondiga renovation in Bilbao.
The intricate design of the column would be manufactured thanks to a combination of several plaster moulds with advanced slip casting, which will then be fired and glazed in different tones.
The geometry will be achieved combining the traditional ceramic craft with digital fabrication techniques.

Process, Materials and Tools

The main focus of the exercise is to research the possibilities of ceramic slip casting to create complex geometries and to get an understanding of the process casting with several plaster moulds.


Fig. 30: SANAA, Naoshima island terminal building, Japan


Fig. 31: John Wardle Architects - Melbourne Summer Pavilion

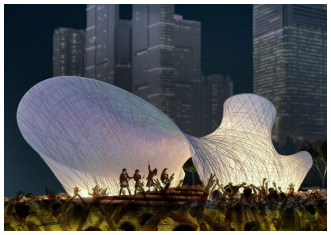


Fig. 32: LEAD Architects - WKCD Pavilion - West Kowloon Cultural District, Hong Kong

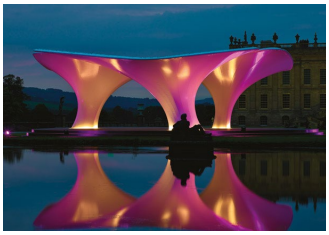
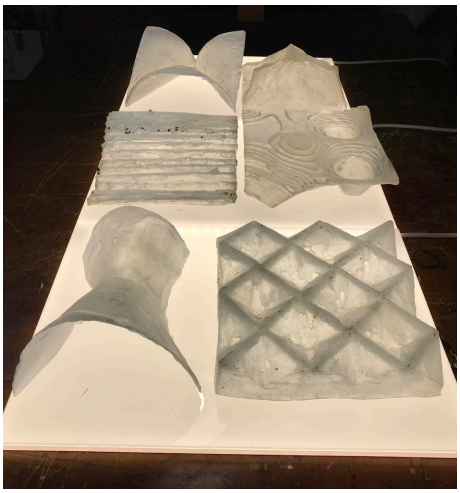


Fig. 33: Lilas Installation - Zaha Hadid Architects, London



Exercise Information

Individual / Group work:
Individual
Mini Brief:
Designing a Pavilion
Workshop involved:
Wood / Clay / Silicone / Plaster / Resin
Duration:
6+6 hours
Connection with the next exercise:
Yes -Resin Casting
Scale:
1:100

Mini Brief

Participants will individually design and build a temporary Summer Pavilion at a scale of 1:100. The goal of the exercise is to explore complex geometries applied to architecture and how are they designed and manufactured using different casting materials combined with fiberglass such as Glass Reinforced Polyester (GRP), Glass Reinforced Gypsum (GRG) and Glass Reinforced Concrete (GRC). We will begin by designing the master using a working table of approx. 20x20x5cm, then applying a thin layer of silicone over the master - using an advanced brushing technique - and making a number of copies using fibers combined with resin, plaster, jesmonite and concrete combined with tints and fillers .
The result will be a thin yet resistant resin skin to which we can apply colour and texture.

Process, Materials and Tools

The base material to design the master are wood or clay, and the equipment includes woodworking tools such as laser cutter, wood carving duplicator, carpentry table saw, circular sander, chisels, drills and sand paper.

Fig. 34: Cristina Iglesias Sculpture Series

Exercise Information

Individual / Group work:
Individual
Mini Brief:
Void Intersection
Workshop involved:
Metal Casting / Lost Wax
Duration:
8 hours
Connection with the next exercise:
No
Scale:
1:1

Mini Brief

This exercise aims to explore the possibilities of bronze lost wax casting as a tool to design and shape spatial ideas. Each participant will design a spatial composition by intersecting geometries. The master elements will be designed and modified using bee wax, which can be cut, carved, composed and melted to achieve the desired result. Once the master is finalised we will connect the geometry with a number of sprues and build a plaster carcass around before pouring the bronze.

Process, Materials and Tools

Lost wax casting is a unique process that allows us to manufacture almost any spatial configuration in metal. The master wax is worked and then covered with plaster of Paris.
Once the plaster is set the wax is melted to provide for a cavity through which the bronze will melt taking the shape of the original master. Once the metal is poured it can be finalized and coated with several patinas.

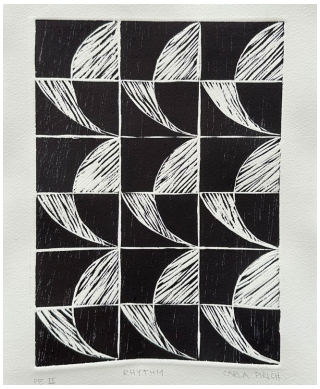
Exercise Information

Individual / Group work:
Individual
Mini Brief:
Free sketching
Workshop involved:
Wood / Ink / Press Printing
Duration:
6 hours
Connection with the next exercise:
Yes - Press Printing
Scale:
1:1

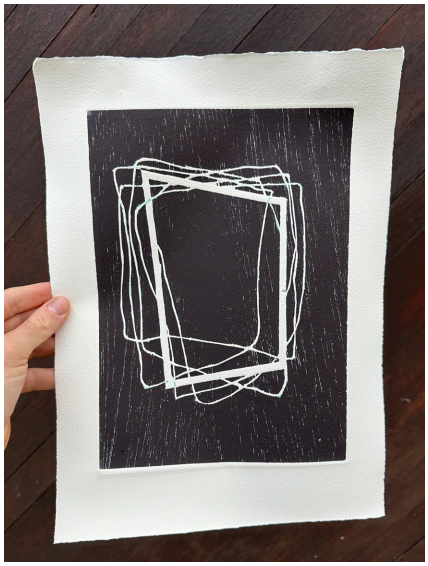
Mini Brief

This exercise explores the relief printing technique of woodcut. Participants will carve a design by hand into a block of wood using gouges, leaving the printing parts level with the surface while removing the non-printing parts. The areas cut away will carry no ink, while characters or images at surface level will carry the ink to produce the print.

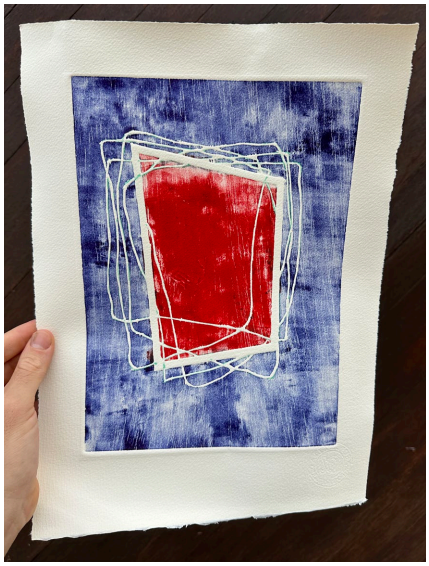
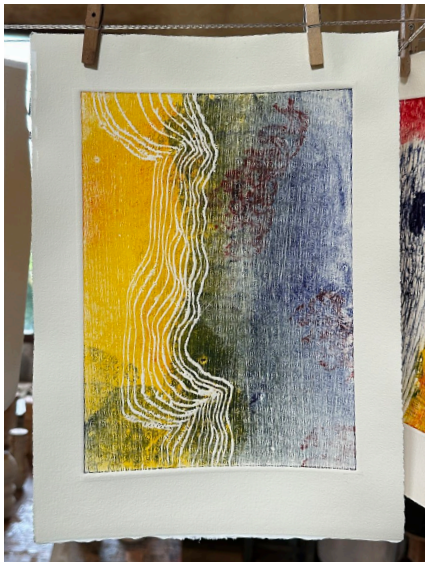
The block is cut along the wood grain (unlike wood engraving, where the block is cut in the end-grain). The surface is covered with ink by rolling over the surface with an ink-covered roller (brayer), leaving ink upon the flat surface but not in the non-printing areas.









DAY 01

09.30	**Bienvenida e introducción al taller** Welcome and Workshop Induction **Técnicas y materiales** Techniques and Materials **Conferencia /** Lecture "ALJ works and practice "
10.30	**Diseño columna - Escayola** Column design - Plaster
13.30	**Comida / Lunch**
15.00	**Moldes de escayola** Plaster Moulds
21.00	**Tiempo libre /** Free time

DAY 02

09.30	**Diseño Pabellón | Taller de madera** Pavilion Design | Wood Workshop **Moldes de escayola** Plaster Moulds **Colada de Barbotina |** Slip Casting copy
13.30	**Comida /** Lunch
15.00	**Moldes de Silicona |** Silicon Moulds
17.30	**Tiempo libre /** Free time

DAY 03

09.30	**Diseño cera perdida |** Lost Wax design **Desmoldar barbotina y nueva copia** Unmoulding Slipcasting and new casting
13.30	**Comida /** Lunch
14.30	**Moldes de escayola |** Plaster Moulds **Vaciado de la cera |** Emptying the wax
17.30	**Tiempo libre /** Free time

DIA 04

09.30	**Xilografía /** Woodcut **Desmoldar barbotina** Unmoulding Slipcasting
13.30	**Comida /** Lunch
14.30	**Copia Pabellón |** Copy Pavilion Jesmonite
17.30	**Tiempo libre /** Free time

DAY 05

09.30	**Colada de Bronce | fundición** Bronze Casting | melting **Lijado cerámica |** Sanding Ceramic **Bizcochado cerámica |** Ceramic Bisque **Copia Pabellón |** Copy Pavilion Resin
14.30	**Comida /** Lunch
15.00	**Visita Santander /** Santander Visit

DAY 06

09.30	**Estampación en papel** Printing Press in paper **Esmalte de piezas de cerámica** Ceramic Glazing
14.00	**Comida /**Lunch
15.00	**Lijado bronce - Patina** Bronze sanding - Patine
20.00	**Exposición - cena fin de curso** Exhibition - final event dinner

DAY 07

09.30	**Firmado Obra Gráfica** / Artwork Signing **Empaquetado obra** / Work wrapping
12.00	**Fin de Taller / End of the Workshop**

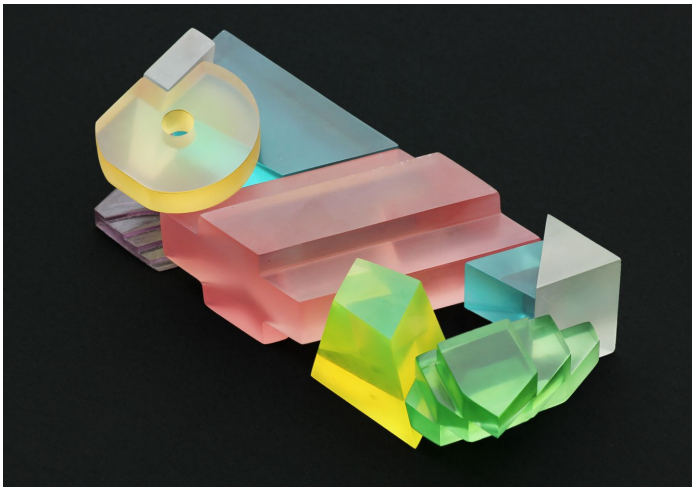


Fig. 35: Model for the project KU.BE, commissioned by MVRDV, The Netherlands, 2013.

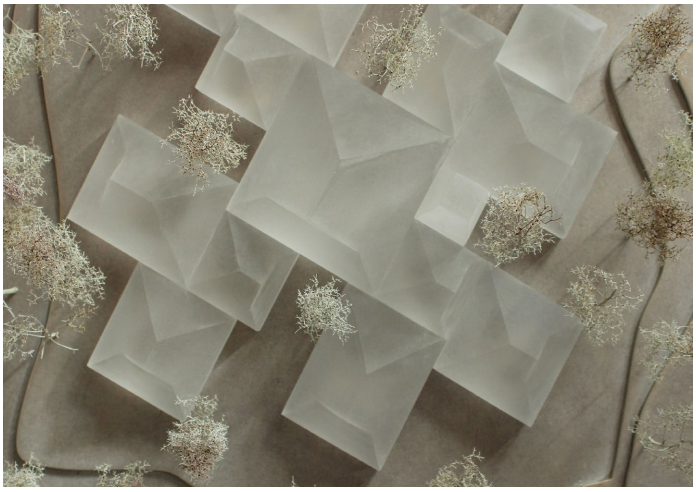


Fig. 36: Model for Arvo competition, commissioned by Alejandro Zaera-Polo AZPML, United Kingdom, 2014.

Fig. 38: Architectural model adapted for the visually impaired, Santander Council, Spain, 2014.

Fig. 37: Model for Taby competition, in collaboration with Bjarke Ingles Group, BIG, Denmark, 2011.

Atelier La Juntana Practice

Atelier La Juntana is a group of architects and artists developing architectural models in an international framework. Through a wide collaborative experience with various architectural practices and public institutions, their work is grounded on accurate and rigorous, yet always creative, production. Using a balanced mix of art and technical skills, their work combines the precision of architectural design with remarkable (innovative or handcrafted) materials and techniques. Therefore, the result is not a mere reproduction of the designed project, but rather a unique interpretation, enhancing the ideas and qualities behind the architectural creation. Traditional processes used in fine arts, such as acid etching, casting resin copies, silicone moulds and embossed paper, are combined with cutting-edge manufacturing and prototyping techniques. Likewise, 3D printing and the laser cutting process reach a high aesthetic and visual interest, while keeping accuracy and precision, both on an urban scale and on a 1:1 scale of detail. Over the last 10 years, the group's work has been exhibited worldwide on numerous occasions, such as at the Architecture Official College of Madrid 2008, the 12th International Architecture Biennale in Venice 2010, the Cité de l´ Architecture et du Patrimoine de Paris 2012, and the Architecture Official College of Cantabria 2014.

Clients and Collaborators

MVRDV Architects, The Netherlands.
ADEPT Architects, Denmark.
Bjarke Ingels Group, BIG Architects, Denmark.
Santander City Council, Spain.
Delegación Territorial de la ONCE Cantabria, Spain.
Alejandro Zaera-Polo, AZPML Architects, United Kingdom.
Cité de l `Architecture et du Patrimoine, Paris, France.
Paul St George, Devices of Wonder, Londres, United Kingdom.
Architecture Official College of Madrid.
Architecture Official College of Cantabria
Escuela Técnica Superior de Arquitectura de Madrid, ETSAM, Spain.
12th International Architecture Biennale, Venice, Italy.

Fig. 39: Coral Frontiers by Rosa Rogina, intervention on the Diego Garcia Island, 2015.

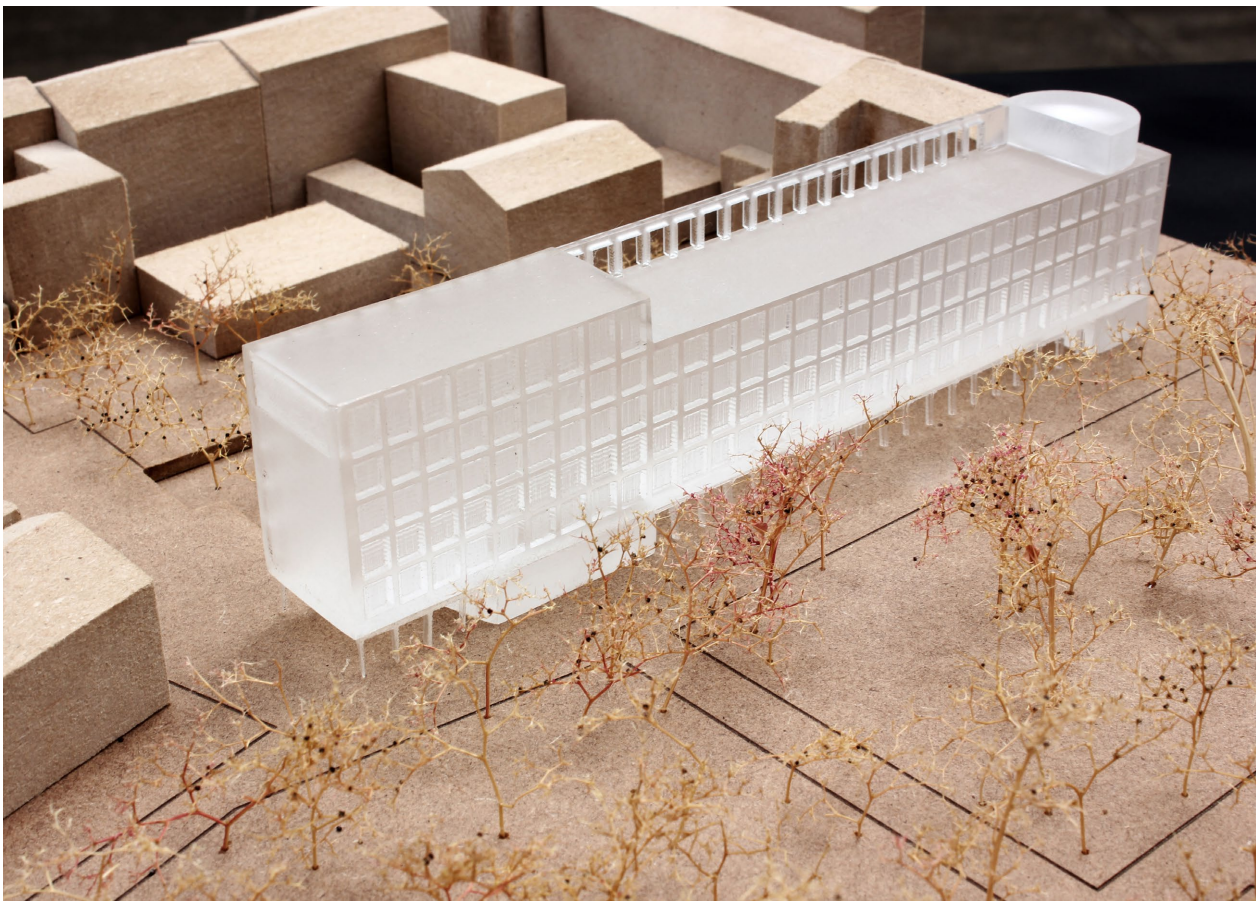
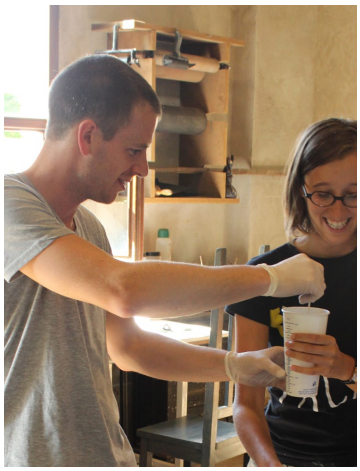


Fig. 40: Model for an University Campus Centre, San Sebastián, Spain 2014.

Throughout the course, participants are supported by three tutors, two architects and one artist. The tutors will lead an induction to the workshop equipment, techniques and materials available and assist each student in the production of the models. They will also aid with documentation (photography and animation) to provide a complete record of the course. In parallel, informal one-to-one tutorials for individual projects and the further exchange of ideas will take place.

Daniel Gutiérrez Adán (Santander, 1955)
Daniel is an interdisciplinary artist whose work encompasses a broad conceptual and formal span, with his artistic origins grounded in the fields of ceramics and sculpture. For over 30 years of his artistic career, he has researched and innovated tirelessly in the territory of contemporary sculpture. His solid technical background is coupled with unrelenting curiosity and a steady and always-necessary inquisitive drive. Besides his work as an artist, equally noteworthy is his intensive educational work, which he has developed in parallel with his art practice since his first steps as a professional. This activity has given him a chance to engage in constant dialogue with younger generations of artists. His work is part of an extensive number of museums and collections, such as Moderner Kunst Stiftung Ludwig Vienna, Fine Arts Museum Bilbao, Fundación Marcelion Botín Santander, Art Context Mountrouge Paris, New Europa Supranational Art Milan, ARCO `01 Open Spaces Madrid, Basel Art Fair Switzerland, Jacques Hachuel Collection Madrid and Runnymede Sculpture Form, Los Angeles.



Armor Gutierrez Rivas (Oviedo, 1984)
Armor graduated as an Architect from Polytechnic University of Madrid School of Architecture in 2009. He spent part of his studies abroad at École Nationale Supérieure d'Architecture de Paris La Villette. Member of Cantabria´s Architecture Official College since 2010, he participates actively in several Architectural Workshops with Elia Zenghelis, Carme Pinos or Mathias Klotz along with artistic collaborations with Andrés Jaque, Uriel Fogue or Chema Madoz.
He received a Leonardo grant and joined Bjarke Ingels Group in Copenhagen, working during two years in several projects and actively collaborating in the Expo 2010 Shanghai in China. In 2012 he starts collaboration with MVRDV in Rotterdam, working as a Project Architect and BIM Coordinator, and later developing a number of architectural models for the office. His work has been awarded with several prizes worldwide such as Gaudi Competition for Sustainable Architecture in 2010, Fundamentos de Arquitectura in 2008, Catedra Blanca ETSAM in 2004 or International Art Context Pancho Cossio in 2002 among others.

Nertos Gutierrez Rivas (Santander, 1989)
Nertos graduated as an Architect from Polytechnic University of Madrid School of Architecture in 2015. He spent part of his studies abroad at Technical University Vienna. His experience includes a wide range of scales, from urban planning and architectural projects including site delivery to exhibition design and 1:1 prototypes and installations. He works since 2020 as a Project Architect for Herzog & de Meuron in Berlin after having collaborated during the last years in some distinguished architectural offices across Europe.
He has given workshops as a guest lecturer at various renowned universities such as the VCU School of the Arts in Qatar, Manchester School of Architecture or the University of Nebraska among others, since 2022 he has been collaborating as a guest lecturer at the Berlin International University. His work has been awarded with several prizes worldwide and exhibited in different institutions such as the XII Venice Architecture Biennale, the Cite de l'Architecture et du Patrimoine in Paris, the School of Architecture in Madrid, or the Ecole Nationale d'Architecture in Rabat.

Bilbliography & recommended reading

Sennet, Richard.
The Craftsman - London: Penguin Group, 2008.

Dunn, Nick.
Architectural Modelmaking - London: Laurence King, 2010.

Universidad de Salamanca - Campus de Excelencia Internacional -
Massachussets Institute of Techonology (MIT) - Open Course Ware.
http://ocw.usal.es/humanidades/lenguajes-alternativos-con-la-grafica/materiales-de-clase/

Arts Council England - Barbican Centre - Walead Besthy Studio
Walead Besthy Studio Exhibition, The Curve, Barbican Centre

Fundación Helga de Alvear, Publicaciones.
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Studio Chad Wright
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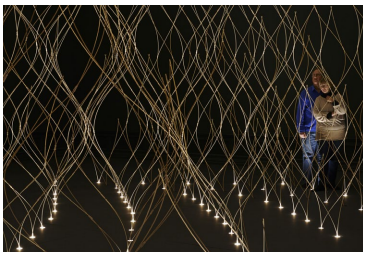

Fig. 41: Kengo Kuma, Sensing Space Exhibition, Royal Academy of Arts, London 2014.
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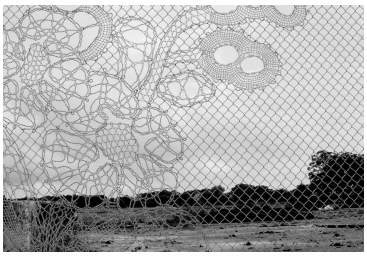

Fig. 42: Lace Fence Architectural Fabric, The Netherlands 2014.
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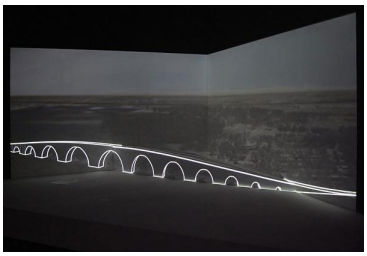

Fig. 43: BIG, Bjarke Ingles Group, Loop City Model, Venice Biennale, 2010.
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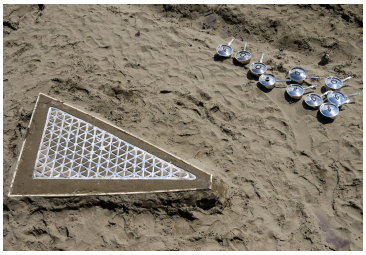

Fig. 44: Max Lamb Petwer Desk, Pewter, Caerhays beach, Cornwall, United Kingdon 2011.
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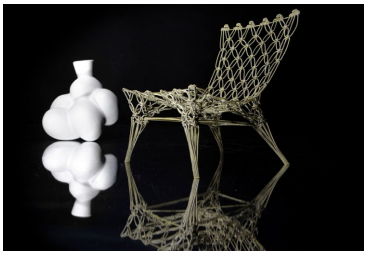

Fig. 45: Marcel Wanders, Knotted Chair, Droog´s Dry Tech Project, 1996.
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Fig. 46: "The Column", video installation, Adrian Paci's Architecture Biennale in Venice, 2014.
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