# International Summer Workshop Modelmaking in the Digital Age From craftsmanship to automated production Santander, Spain







Architecture Official College of Cantabria

Polytechnic University of Madrid

# **Modelmaking in the Digital Age |** International Summer Workshop

## **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 Architectural 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 architectural 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 openminded research environment.







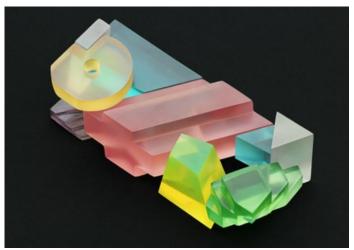


Fig. 4: Model for the project KU.BE, commissioned by MVRDV, The Netherlands, 2013.



Fig. 5: Model for Arvo competition, commissioned by Alejandro Zaera-Polo AZPML, United Kingdom, 2014



Fig. 7: Architectural model adapted for the visually impaired, Santander Council, Spain, 2014.



Fig. 6: 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 I´ 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. 8: Coral Frontiers by Rosa Rogina, intervention on the Diego Garcia Island, 2015.



Fig. 9: 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 the 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.

As a member of the Architecture Official College of Cantabria since 2010, he has been actively participating in several architectural workshops with architects such as Elia Zenghelis, Carme Pinos and Mathias Klotz, alongside artistic collaborations with Andrés Jaque, Uriel Fogue and Chema Madoz.

Armor received a Leonardo grant and joined Bjarke Ingels Group in Copenhagen, working for two years on several projects as a Design Architect and actively collaborating in the Expo 2010 Shanghai in China. In 2012, he started a collaboration with MVRDV in Rotterdam, working as a Project Architect and BIM Coordinator; he later developed a number of architectural models for MVRDV. His work has been awarded several prizes worldwide, such as at the Gaudi Competition for Sustainable Architecture in 2010, Fundamentos de Arquitectura in 2008, Catedra Blanca ETSAM in 2004 and the International Art Contest Pancho Cossio in 2002, among others.

#### Nertos Gutierrez Rivas (Santander, 1989)

Nertos graduated as an Architect from the Polytechnic University of Madrid School of Architecture in 2015. He spent part of his studies abroad at Technical University Vienna, where he specialised in graphic design and video production. He continues his education, collaborating on several workshops with Campo Baeza, Tuñón y Mansilla and Chema Madoz. Over the last three years, he has participated at IFAC (International Festival of Art and Construction) as a Photography and Video Tutor.

In 2013, Nertos worked in partnership with Renzo Piano and Fundacion Botin on the exhibition Creating Future at the Botin Center, where he explained the future development of Santander city to blind people through tactile models. His work has been awarded several prizes worldwide, such as at the Isover Competition 2013, the Gaudi Competition for Sustainable Architecture in 2010, and the International Art Contest Pancho Cossio in 2006, among others.









# **Modelmaking in the Digital Age |** International Summer Workshop

# About the workshop

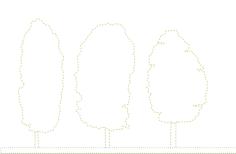
Facilities and equipment



Fig. 10: Workshop, interior view.



Fig. 11: Workshop and apartment, view from the garden.



The Workshop 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. 12: Axonometric view of the facilities.







# **Modelmaking in the Digital Age |** International Summer Workshop

# **About the Workshop** Facilities and equipment











Fig. 16: Ceramic oven.





Fig. 17: Aluminum melting oven

Fig. 19: Vacuum forming machine.

Fig. 18: Printing press.









Fig. 20: Laser cutting machine.

Fig. 21: Cianotype UV Light box.









Fig. 22: Aerial image of the workshop's surroundings, including Quebrada Coast area, Dunas de Liencres Natural Park and Picota Hill.







Fig. 24: Dunas de Liencres Forest.



Fig. 25: Quebrada Coast protected area.



Fig. 26: 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.

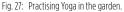
In parallel, part of the Workshop exercises take part in the surrounding areas, using materials collected from the forest and beaches and through direct interaction with the landscape.













ig. 28: Workshop induction.



Fig. 29: Explanation of previous work by Atelier La Juntana.



Fig. 30: Barbacue following aluminium casting workshop.



Fig. 31: Guided tour of Santander city organised by Domingo de La Lastra, from the Architectural College.



Fig. 32: Trip to Somocuevas beach with tutors and participants, MMDA-14.



Fig. 33: Open doors day, MMDA-14.

"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"









Fig. 34: Explanation of the work developed during the workshop MMDA-14.



Fig. 35: Tactile paper used for models adapted for the visually impaired.



Fig. 36: Prints collection.



Fig. 38: Coloured polyester towers displayed on a lighting box.



Fig. 37: Participants and tutors during the Diploma award ceremony, MMDA-14.

During the closing event and exhibition at the Architecture Official College of Cantabria (COACAN) in Santander, the students presented their work in public and were awarded with the Workshop Diplomas.







Modelmaking in the Digital Age

Atelier La Juntana, in collaboration with the Architecture Official College of Cantabria and the Polytechnic University of Madrid, is organising the 6th edition of the summer workshop 'Model Making in the Digital Age' for architects (both students and professionals) willing to investigate and discover different techniques and materials, while developing an architectural 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 next workshop will take 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 (bed and breakfast) 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. 39: Part of the work developed during the first workshop edition, MMDA-14.







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"
13.30	Comida Compartida Internacional
	International Shared Lunch
15.00	Taller de carpintería
	Wood Workshop
	Moldes de silicona
	Silicon Moulds
	Colada resina poliéster   muestras
	Casting Polyester Resin   samples
18.00	Excursión por el entorno del taller
	Discovering workshop surroundings

DAY 02	
09.30	Cerámica y vidrio   matrices
į	Ceramic and Glass   moulds
:	Moldeo por vaciado en barbotina
	Slip Casting
13.30	Comida / Lunch
15.00	Cerámica y vidrio   piezas
:	Ceramic and Glass   tiles
18.00	Elección ciudades   Cities selection

DAY 03	
09.30	Grabado Barniz Duro
	Hard Ground Engraving
13.30	<b>Comida /</b> Lunch
15.00	Fotograbado y cianotipado
	Photo Etching and Cyanotype
	Desmolde y colada de resina
	Unmoulding and resin casting
18.00	<b>Tiempo libre /</b> Free time

DIA 04	
09.30	Gofrado y papel táctil
	Embossing and Tactile Paper
	Estampación en papel
	Printing Press in paper
13.30	<b>Comida /</b> Lunch
15.00	Estampación en papel
	Printing Press in paper
17.00	Excursión guiada ciudad de Santander
	Guided trip Santander City Center

DAY 05	
09.30	Desmolde y colada de resina
	Unmoulding and resin casting
13.30	<b>Comida /</b> Lunch
15.00	Colada de aluminio y plomo  idea
	Aluminum and lead Casting   idea
	Termovaciado
	Vacuum forming
17.00	Casas de arena playas de Liencres
	Sand Houses Liencres Beach

DAY 06	
09.30	Colada de aluminio y plomo   matrices Aluminum and lead Casting   moulds Tutorías individuales Individual tutorials
13.30 15.00	Comida / Lunch Colada de aluminio y vidrio   fundición Aluminum and Glass Casting   melting
18.00	<b>Tiempo libre</b> Free time

DAY 07	
09.30	Serigrafía
į	Silk printing
	Esmalte de piezas de cerámica
į	Ceramic Glazing
13.30	<b>Comida /</b> Lunch
16.00	Preparación exposición
	Exhibition set-up
17.00	Exposición – barbacoa fin de curso
!	Exhibition - barbacue final event





01	Carpentry and Wood Working Workshop
	Carving a Tower
	The Metal City
02	Silicone Mould Making Workshop
	Carving a Tower
03	Resin Casting Workshop
	Carving a Tower
04	Photo Etching Workshop
	High Relief City
05	Hard Ground Etching Workshop
	Carving a Tower
06	Printing Press Workshop
07	Silk Printing Workshop
08	Aluminium Casting Workshop
	The Metal City
09	Embossing Paper Workshop
	The Skin of the Building
10	Lead Casting Workshop
	Sand Houses
11	Ceramic and Slip Casting Workshop
	Facade Prototype - Ceramic







01 - Carpentry and Wood Working Workshop









#### **Exercise Information**

Mini Brief:

#### **Carving a Tower**

Area involved:

#### **Wooden Workshop**

Duration:

#### 6 hours

Material:

#### IPE Wooden base 4x4x10cm

Connection with the next exercise:

Yes - Silicone moulds / Polyester Resin

Scale:

#### 1:1000

Key Words: Carving#Casting#Cutting#BushHam mering#Sanding#Scale#Texture#Proportion#Wo od#Saw#Hammer

#### Mini Brief

Taking advantage of the flexibility of woodworking, this exercise serves as a great induction to the variety of the workshop equipment. Using a solid wood block as a base, the student will develop an architectural idea, with geometry and texture playing a key role. Students are encouraged to use different woodworking techniques such as carving, bush hammering, cutting, sanding, subdivision and deconstruction. At the end of the activity, each unique creation is replicated by means of silicone moulds, as a transition to the next exercise.

#### **Process, Materials and Tools**

The base material is wood, and the equipment includes woodworking tools such as a laser cutter, a wood carving duplicator, a carpentry table saw, a circular sander, a hammer, chisels, drills and sand paper.

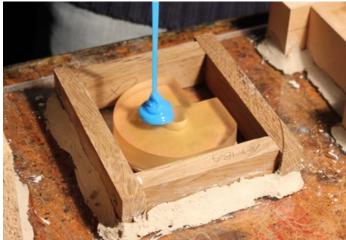






02 - Silicone Moulds Workshop









#### **Exercise Information**

Mini Brief:

#### **Carving a Tower**

Area involved:

#### Silicone Mould Workshop

Duration:

#### 2 hours

Material:

#### Wooden master / Silicone / Perimeter wood 5mm

Connection with the next exercise:

#### Yes - Carpentry Workshop / Polyester Resin Workshop

Scale:

1:1000

Key Words: Copy#Mould#Silicone#Chemistry#Re action#Precision#Texture

#### Mini Brief

This exercise is a continuation of the carpentry and wood workshop. It explores the use of silicone moulds to replicate objects, materials and textures. Using a one-piece flexible silicone mould, the student will reproduce a master—in this case, the architectural creation from the first exercise. Further applications and good practice on silicon moulds will also be studied as part of the exercise.

#### **Process, Materials and Tools**

The process involves covering the object we want to reproduce with a flexible, yet resistant, material, creating the negative volume of the object: the so-called mould. Wooden containing walls are set up to enclose each volume. Silicone is then poured around the master and casted creating the mould. This technique allows us to replicate every detail and texture in a precise and efficient way as many times as necessary.







03 - Resin Casting Workshop









#### **Exercise Information**

Mini Brief:

#### Carving a Tower

Area involved:

#### **Resin Casting Workshop**

Duration:

#### 3 hours

Material:

#### Silicone mould / Polyester resin / Epoxi resin Acrylic Resin / Tints, pigments and fillers

Connection with the next exercise:

#### No

Scale:

#### 1:1000

Key Words: Copy#Mould#Silicone#Chemistry#Re action#Precision#Texture#Catalyst #Resin

#### Mini Brief

The first part of this exercise consists of preparing a number of samples where the student will investigate different finishes for the polyester resin, using tints, pigments and fillers to play with the colour, transparency and texture. Each participant will prepare five samples combining different finishes, while keeping a record of the proportions and method, thus creating a wide range of choice.

Once the silicone mould has cured, the student will extract the master to create a replica with polyester resin, selecting the finish from the sample collection and adding animation (figures and trees) which will crystallise inside the piece.

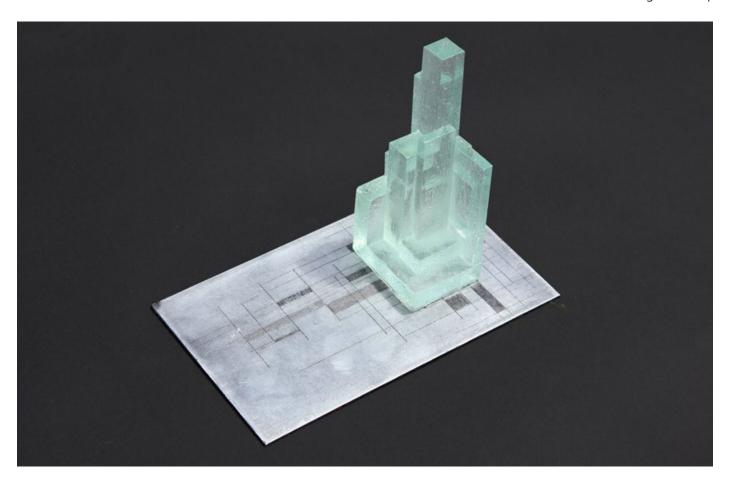
#### **Process, Materials and Tools**

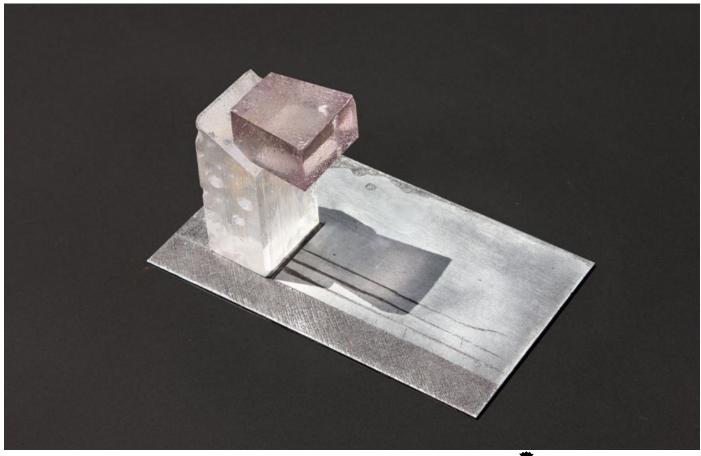
Coloured resin technique uses a synthetic resin mixed with a curing agent (polymerisation catalyst) which is poured into a mould or plastic container at room temperature and under normal pressure. By mixing both liquids, an exothermic reaction occurs, generating heat, and making the material harden within several minutes. Different types of resins can be used, including polyester resin, polyurethane resin, epoxy resin, acrylic resin and silicone resin. As the normal appearance is transparent, resins can be coloured using tints and fillers, allowing different degrees of opacity, tone and textures. Once the material dries, it can be shaped and sanded.

































04 - Photo Etching Workshop











#### **Exercise Information**

Mini Brief:

#### **High Relief City**

Area involved:

#### **Photo Etching Workshop**

Duration:

#### 4 hours

Material:

#### Zinc plate / Black and white print

Connection with the next exercise:

**Yes - Printing Press** 

Scale:

#### 1:2000

Key Words: Etching#Zinc#Reaction#Acid#Paint# HorizontalPress#SitePlan

#### Mini Brief

This exercise explores the possibilities of acid etching to transfer plans and drawings onto different materials and surfaces, so they can be used as site plans, model bases or tactile maps. Each participant will etch a metal plate with a given design, controlling the precision and depth of the carving.

#### **Process, Materials and Tools**

The cyanotype process uses one of the earliest photographic processes, invented by the scientist Sir John Herschel in 1842, and used by pioneering photographer Anna Atkins in the first published book to include photographic images.

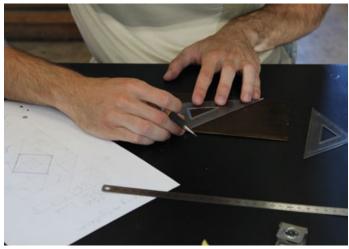
The process starts by coating the metal surface with a UV-sensitive product, to which an acetate layer with the design printed in black and white is applied. Exposure to UV light will create a mask on the plate that shields the printed area, which is therefore protected during the etching process. The unshielded parts get carved by acid; the depth of the mark is controlled by the acid exposure time.







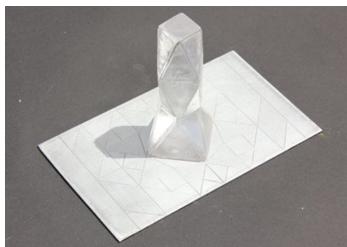
# 05 - Hard Ground Etching Workshop











#### **Exercise Information**

Mini Brief:

#### **Carving a Tower**

Area involved:

#### Hard Ground Etching Workshop

Duration:

#### 4 hours

Material:

#### Zinc plate / Drawing and carving tools

Connection with the next exercise:

**Yes - Printing Press** 

Scale:

1:1000

Key Words: Etching#Zinc#Reaction#Acid#Paint# RollingPress#SitePlan

#### Mini Brief

This exercise explores another technique to transfer designs onto metal surfaces, using the hard ground etching method. For this exercise, each participant will draw a design by hand directly upon the surface, which will later serve as a base for the polyester resin tower.

#### **Process, Materials and Tools**

A hard ground coating layer is applied to a plate to protect it from the action of the mordant used in etching. The hard ground is typically drawn through with carving and drawing tools. Traditionally, the hard ground yields a pen-like line associated with etchings. The longer the hard ground plate is exposed to the acid, the deeper and wider the line becomes.







# Modelmaking in the Digital Age | International Summer Workshop | Program: techniques and exercises | 05 - Hard Ground Etching Workshop |













# 06 - Printing Press Workshop









#### **Exercise Information**

Mini Brief:

#### **Printing Press**

Area involved:

#### **Printing Press Workshop**

Duration:

#### 2 hours

Material:

#### Cotton Paper / Tarlatan / Ink

Connection with the next exercise:

Yes - Etching

Scale:

#### **Varies**

Key Words: Etching#Zinc#Ink#Tarlatan#RollingP ress#VerticalPress

#### Mini Brief

In this exercise, the surfaces and plates etched in previous exercises will be printed on cotton paper, creating various copies of the designs in different colours and textures.

#### **Process, Materials and Tools**

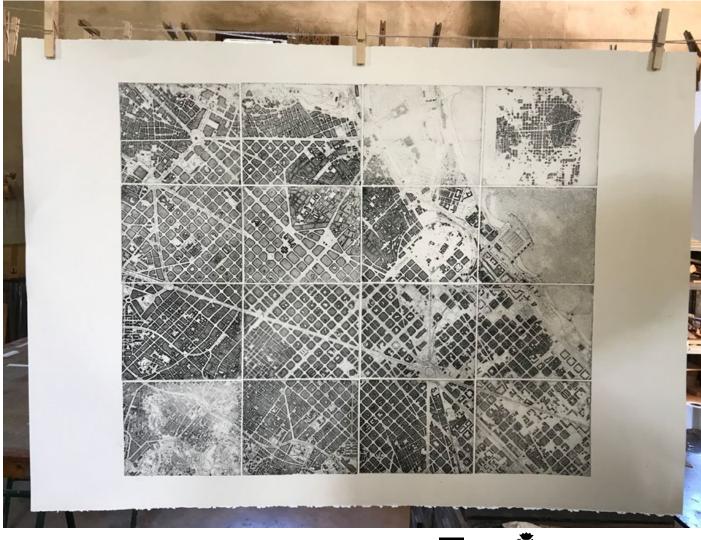
Materials and equipment include tarlatan, cotton paper, a water tray, a roller, tints and a printing press. Firstly, the ink is applied across the surface, both in the carved and non-carved areas. Secondly, using an open-weave cotton fabric called tarlatan, the ink from the non-carved areas is removed, remaining only on the designed area. Finally, pressure is applied over the surface, transferring the design onto the paper by means of a rolling press or vertical press.























#### **Exercise Information**

Mini Brief:

#### **Silk Printing Design**

Area involved:

#### Cyanotype Workshop

Duration:

#### 2 hours

Material:

#### Screen / Black and white acetate print

Connection with the next exercise:

No

Scale:

1:1

Key Words: #Silkprinting#cyanotype#tshirts #acetate#photoemulsion

#### Mini Brief

To better understand the process behind silk and screen printing, the participants will engage on the design of a silk screen that will be later transferred into any textile base.

#### **Process, Materials and Tools**

The cyanotype process uses one of the earliest photographic processes, invented by the scientist Sir John Herschel in 1842, and used by pioneering photographer Anna Atkins in the first published book to include photographic images.

The process starts by coating the metal surface with a UV-sensitive product, to which an acetate layer with the design printed in black and white is applied. Exposure to UV light will create a mask on the plate that shields the printed area, which is therefore protected during the etching process. The unshielded parts get carved by acid; the depth of the mark is controlled by the acid exposure time.







08 - Aluminium Casting Workshop









#### **Exercise Information**

Mini Brief:

#### **Metal City**

Area involved:

#### **Aluminium Casting Workshop**

Duration:

#### 8 hours

Material:

#### Wooden base 14x20x4cm / Aluminium / Foundry

Connection with the next exercise:

Yes - Wood Working Workshop

Scale:

#### **Varies**

Key Words: Aluminium#Foundry#Sand#Bentoni te#Copy#Master

#### Mini Brief

This exercise investigates the potential of sand casting to reproduce an idea onto a metal working prototype. Each participant will create a design for a city, using a wooden base to be reproduced in aluminium.

#### **Process, Materials and Tools**

Materials include the master wooden piece to be reproduced, a mix of sand, water and bentonite, the wooden box which helps us in creating the sand mould, and the aluminium casting foundry. The oven is heated to 660 degrees to melt the aluminium, which will be poured into the sand mould, taking the shape of the original object.







# Modelmaking in the Digital Age | International Summer Workshop | Program: techniques and exercises | 08 - Aluminium Casting Workshop



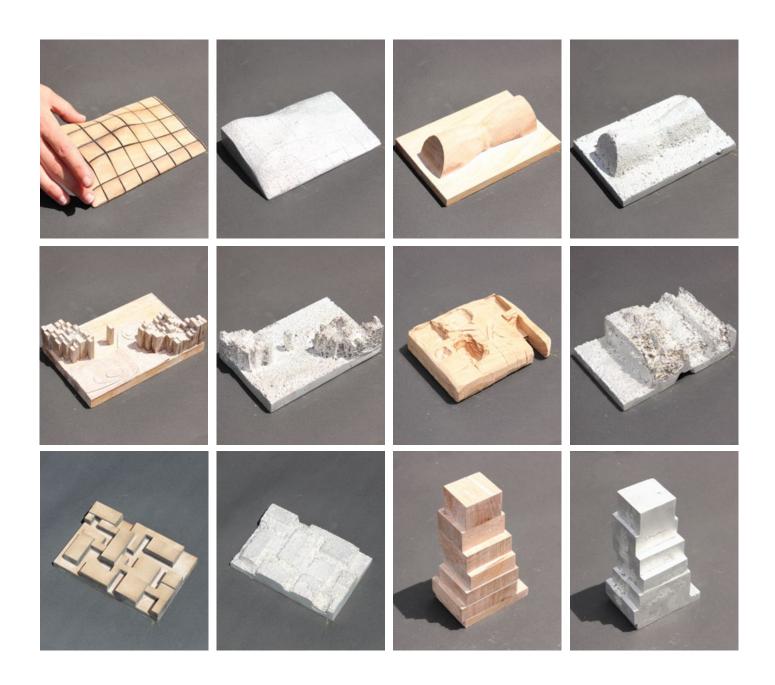














09 - Embossing Paper Workshop









#### **Exercise Information**

Mini Brief:

The skin of the building

Area involved:

**Embossing Paper Workshop** 

Duration:

4 hours

Material:

Wooden base plate / Cotton paper / Rolling

Press

Connection with the next exercise:

Yes - Wood Working Workshop

Scale:

1:20

Key Words: Pressure#RollingPress#Paper#Facad ePattern#Embossing#Mark

#### Mini Brief

In this exercise, each participant will design a façade pattern that will later be transferred from a wooden plate onto cotton paper through the embossing method, creating a proposal for the skin of the project. The neutral colour and texture of the paper enhances the geometry and the pattern design.

#### **Process, Materials and Tools**

Paper embossing is the process of creating raised or recessed relief plans and designs in paper, providing a three-dimensional effect and creating a paper landscape of a given design. The pressure of the rolling press compresses the fibres of the papers, marking the surface with the desired drawing. Additionally, this technique can be used to create tactile models which can be explored by visually impaired people.







10 - Lead Cating Workshop









#### **Exercise Information**

Mini Brief:

#### Lead cube

Area involved:

#### **Lead casting Workshop**

Duration:

#### 4 hours

Material:

#### Clay forms / silicone / lead

Connection with the next exercise:

#### No

Scale:

#### 1:500

Key Words: #lead#Mould#Silicone#clay#

#### Mini Brief

This process allows us to reproduce an object in lead using high resistant temperature silicone. The master is to be designed in clay.

#### **Process, Materials and Tools**

Materials include clay to produce the master and high resistant temperature silicone to create the lead copies.



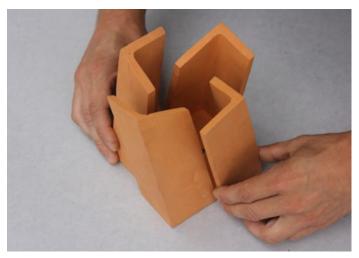




# 11 -Ceramic and Slip Casting Workshop











#### **Exercise Information**

Mini Brief:

Facade Prototype - Ceramic

Area involved:

**Ceramic Workshop** 

Duration:

8 hours

Material:

Master / clay / ceramic oven

Connection with the next exercise:

Yes - Wood Working Workshop

Scale:

1:1

Key Words: Ceramic#Oven#Temperature#Mould #Glazing#SlipCasting#Degrees

#### Mini Brief

Ceramic is one the most versatile and universal constructing elements, combining tradition and cuttingedge design. In this exercise, participants will design a ceramic façade prototype. Several options will be available while working with clay: plaster casting, slip casting and a potter's wheel, or a combination of techniques. The students will experiment with different types of clay, glazing colour, texture and oven temperature, creating a collection of samples for each façade prototype.

#### **Process, Materials and Tools**

Materials include plaster moulds, clay (terracotta, earthenware, porcelain), glazing and mineral pigments, and a ceramic oven.







# Modelmaking in the Digital Age | International Summer Workshop | Program: techniques and exercises | 11 - Ceramic and Slip Casting Workshop













# **Modelmaking in the Digital Age** | International Summer Workshop

#### **Bibliography and References**

#### 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. http://fundacionhelgadealvear.es/

Studio Chad Wright http://www.studiochadwright.com/master-plan

#### Tectónica online library

http://www.tectonica-online.com/imagen/2506/expo\_ceramica\_architect\_aichi\_pabellon\_office\_celosia/

Arquitectura Viva - Mass is More - Thermal Inercia and Sustainability. No 168 11/2014 Ignacio Paricio, La obsesión por la tersura

#### Punta della Dogana

Materia Prima Exhibition, Punta della Dogana, Venice 2014.

Holly Morrison - VCU Center for Teaching Excellence - Small Grant Program www.hollymorrison.com

#### References



Fig. 40: Kengo Kuma, Sensing Space Exhibition, Royal Academy of Arts, London 2014. www.royalacademy.org.uk/exhibition/4

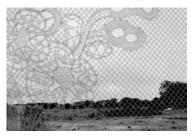


Fig. 41: Lace Fence Architectural Fabric, The Netherlands 2014.

www.lacefence.com

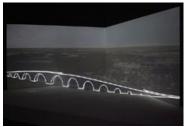


Fig. 42: BIG, Bjarke Ingles Group, Loop City Model, Venice Biennale, 2010. www.big.dk



Fig. 45: Max Lamb Petwer Desk, Pewter, Caerhays beach, Cornwall, United Kingdon 2011. www.maxlamb.org



Fig. 44: Marcel Wanders, Knotted Chair, Droog´s Dry Tech Project, 1996.

www.marcelwanders.com



Fig. 45: "The Column", video installation, Adrian Paci's Architecture Biennale in Venice, 2014. www.labiennale.org/en/mediacenter/video/fundamentals47







# **Modelmaking in the Digital Age** | International Summer Workshop

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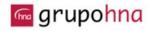
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