Degree in
ARCHITECTURE
Studies

ETSA**B** 2023 - 2024

Courses in English

Welcome to ETSA**B**!

The origins of the Barcelona School of Architecture ETSAB date back to the noble School of Arts and Trades La Llotja, founded in 1775. The institution formed Master Builders by means of an official degree since 1850, the most immediate precedent of the future school of architecture. In 1875 the Barcelona School of Architecture would assume definitively its present name and almost a hundred years later, in 1972, the ETSAB became a co-founder of the UPC Barcelona-TECH.

The Barcelona School of Architecture ETSAB is the **largest and oldest university in Catalonia**, with 3,000 students, 400 teachers and more than 50 administrative staff. The school offers training in all stages of university education and plays a **leading role in research and doctoral studies in the Spanish and Latin American contexts**, through departments and research groups. The school is also a **leader in the teaching of Landscape Architecture in Spain**, in constant collaboration with the most prestigious schools in Europe in this field of knowledge.

The Barcelona School of Architecture has a **continuous influence on the development and design of Barcelona**, a model of architecture and urbanism, and actively participates in the permanent dialogues generated by the city. The school is a world reference in planning, urban design and building. Attentive to debates on environmental culture, it also offers intense technical training, while promoting criticism and historical research through its important archive. As a result, the school is currently ranked among the top twenty schools in the world, according to the QS World University Rankings, and the first in Spain.

How to Read this Guide?

This guide complements the information you will find detailed on the school's website (https://etsab.upc.edu/en/studies/garqetsab/syllabus). In thefollowing pages you will be able to read the syllabi of the courses that ETSAB offers in English (in the version of the last course 2022-23); complemented with results of previous years (which you can consult extensively here: https://www.instagram.com/open_etsab).

The guide should therefore be understood as a set of pieces that do not fit together perfectly: the images presented do not correspond to the same academic year than the syllabi, which in turn might be different this year, as courses are reformulated annually. Taken together, however, these materials provide an accurate picture of the topics on which the school's courses taught in English focus.

We strongly recommend that, in order to get the most out of your time at the ETSAB, you also look at the courses taught in Spanish and Catalan, which you will also find detailed and illustrated in: https://etsab.upc.edu/ca/escola/cultura/publicacions/handbook-etsab/handbook-etsab-2018-2020 and here: https://etsab.upc.edu/ca/estudis/garqetsab/guia-docent/guia-docent-grafica.

For each course in these pages you will find symbols that indicate whether the English group is in the morning or in the afternoon (M or A); whether it is from the first or second semester (1 or 2); and which course of the Degree in Architecture Studies do local students need to be to enrol in it (2, 3, 4 +/or 5).

SEMESTER I

CORE COURSES

	M	A	1	2	1	2	3	4	5
Architectural Representation III**	○	●	●	○	○	○	●	○	○
Design III	●	○	●	○	○	○	●	○	○
History II	●	○	●	○	○	○	●	○	○
Structures II	●	○	●	○	○	○	●	○	○
Thematic Studio I - LAC I*	●	○	●	○	○	○	○	○	●
Urban Design I	●	○	●	○	○	●	○	○	○
Urban Design III	●	○	●	○	○	○	●	○	○
Urban Design V	●	○	●	○	○	○	○	●	○

ELECTIVES

	M	A	1	2	1	2	3	4	5
Adaptive Architecture, Furniture and Design I	●	○	●	○	○	○	●	●	●
Computional Design Protocols Seminar*	●	○	●	○	○	○	○	○	●
International Design Workshop***	●	●	●	○	○	○	●	●	●
Llum Barcelona	●	○	●	○	○	○	○	●	●
Walking Barcelona** + ***	●	●	●	○	○	○	●	●	●

* both courses require joint enrolment
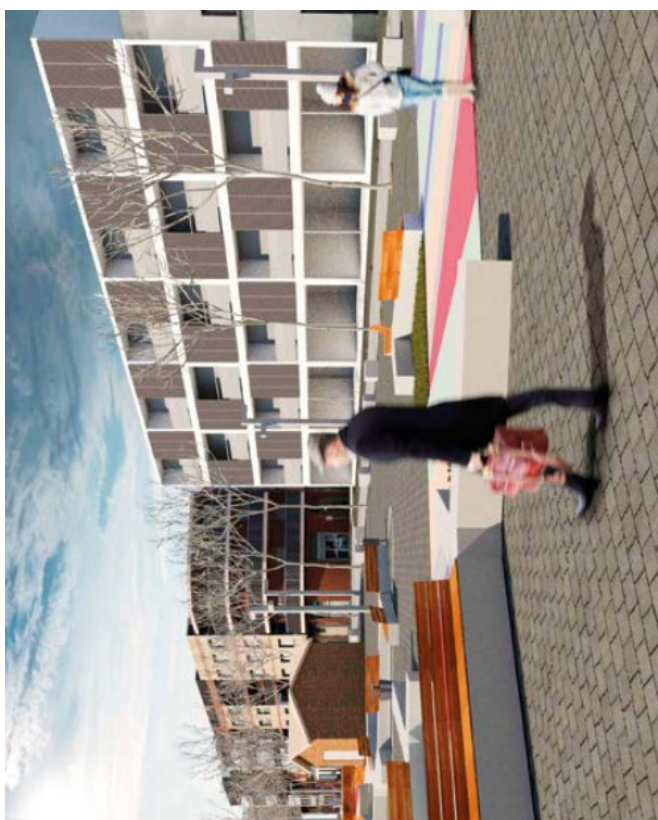** this course is also offered in the spring semester
*** intensive course: mornings and afternoons

Architectural Representation III
Representació Arquitectònica III

Visuals made with 3DSMax

Architectural Representation III focuses on the visual simulation of models and urban and architectural designs. Because of the quick evolution of architectural rendering software, fuelled by the progress in both software and hardware through the innovations from the videogame industry, during the course multiple software is employed in the different groups: non-real time renderers (V-Ray, Corona, Blender), real time renderers (TwinMotion, Enscape, D5), and modelers (3DS Max, SketchUp, Blender). This variety of software has the objective of illustrating the strengths and weaknesses of the different options, and encourages learning multiple alternatives to adapt to different and changing circumstances.

The course is structured in three thematic blocks of roughly the same duration of one month, depending on the specific available dates during the academic year. While the three blocks are independent and focus on different aspects of the curriculum, they are related because they share the same urban setting around which the course is structured.

At the beginning of each block the task statement of the exercise to be developed is provided, along with supplementary material that may be required. During the development of each of the block the required concepts are introduced and explained, following examples that are developed in the classroom and projected onto the screen. These lessons are also supported by material in PDF format and recorded videos. As each block is developed, the format of the classes gradually phases to an eminently practical and applied format, where the students develop their proposals with the support of the instructors.

First block:
The first and initial block focuses on the visual simulation of an urban proposal consisting in the articulation of modular dwellings within its urban context, in coordination with the Urban Design course of the same year. The objective is learning the basic operation of the software that will be used during the course: management of digital models; lighting simulation in daylight and night-time situations; inclusion of vegetation, urban furniture, and virtual characters; topographic manipulation; production of model cut-outs and elevations; and presentation of the results. In this block only (near) real-time render engines are used, and the complexity of colour and texturing is not yet introduced, generating only monochrome volumetric studies.

Second block:
The second block focuses on a photomontage, and consists of integrating a virtual digital model within a photograph of an urban context. The objective is understanding the capture of a snapshot of reality and replicating the process digitally: matching the perspective and point of view from the vanishing points of orthogonal pairs of parallel lines in space; learning the operation of a physical camera and its virtual counterpart; estimating and matching the sun position; replicating the sun and sky contribution to lighting; integrating the virtual model using simulated shadows, reflections and indirect lighting; post production and layering to achieve the final composition.

Third block:
The third and last block focuses on the realistic simulation of an interior or interior/exterior space, achieving the maximum quality that modern render engines are capable of. The students are provided a model of an architectural space where they must define realistic materials and accurate lighting, placing objects according to the intended use and establishing the point of view of the image to explain the architectural or urban proposal. In this block the students can also produce a rendered image of the project that is

developing in the Design Studio course in the current academic year.

Additional exercise:
Finally, there is a complementary exercise that is not compulsory to deliver to receive a passing grade but contributes a small amount to increasing the final grade, which consists of a video animation of the proposal, taking advantage of the increased speed in modern rendering engines to produce video content in a short amount of time. The video can include camera movement, changes in sun position, whether effects, animated persons and vehicles, moving architectural elements like opening doors or revolving fans, and even contextual audio.

Assessment:
During the last week at the end of each of the blocks, the work developed by the students is delivered electronically in the Atenea platform, and a practical exam is conducted focusing on the most crucial aspects explained in each of the blocks.

In addition, the deliverables of the first and second blocks can be improved and re-submitted for evaluation until the end of the course. If all the blocks are passed, the students attain a passing grade for the course (continuous assessment). After this evaluation, there is a final exam that the students that have not obtained a passing grade or have not been able to follow the course can conduct. Furthermore, the students with a passing grade can also opt to increase their grades in this exam, and their final grade will never be lower than the one attained by continuous assessment.

Faculty:
Francesc Valls, course coordinator and English group. Albert Marin, David Martínez, Ernest Redondo, Alberto Sánchez, Juan Ignacio Valgañón. Catalan and Spanish groups (all faculty members can speak English fluently).
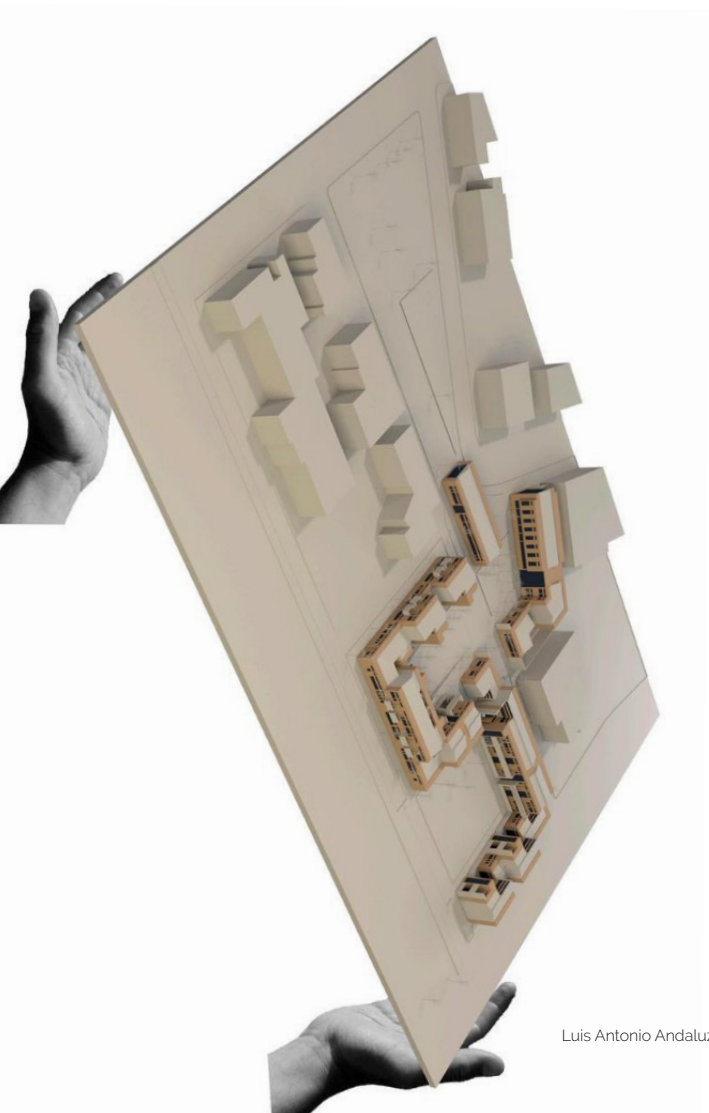
Gerard Lizama

Santiago Expósito

Design III
Projectes III

Jordi Acacio Prat

Luis Antonio Andaluz Burgos

Design Studio III and IV raise the attention to complementary housing emergencies: collective housing on a rural site (first semester); and collective housing on a high-density urban site (second semester).

Design Studio III deals with climate change emergency and therefore environmental parameters are taken into account since the begining pf the course: NATURAL RESOURCES (water management, materials), WASTE (recycled and recyclable materials, land balance), ENERGY (demand reduction mechanisms), HEALTH of people (impact of the proposal on the environment, indoor comfort, natural materials).

The course works in rural areas, where the problem has traditionally been the low density (abandonment of the countryside) and lack of investment. However, in recent years there has been a return to the countryside of both individuals and families, either on a permanent basis (living and working) or weekend visits, increased by the pandemic. The transit of precarious temporary workers between the months of May and September adds to a temporary increase of population in the rural environment.

The design would answer the following questions:
- How should housing relate the vernacular architecture to the natural agricultural environment, allow the villages to grow with respect for the original architecture and respect for the agricultural landscape?
- What is this architecture and this place (where climate change will produce a rise in sea level) to be like? It is a flat site but small variations in level are crucial: will it be a horizontal, vertical or mixed architecture? Elevated or in contact with the ground? Porous or airtight?
- How should this interior be: healthy, flexible and adaptable to different users (new settlers, tourists, seasonal workers, researchers...)?

Site:
The plot is located in the south-west area of the village, in the crossing Ronda de Fortalesa with Major del Poble Nou street, in Poble Nou del Delta. It measures 1610 m2, with a very high phreatic level, barely 90 cm below the plot.

Conditions:
- It should be taken into account that the site is place next to the houses that constitute the historic core of the village, but bordering the countryside. Therefore, the project should include both conditions.
- There is an electricity transformation centre which must be respected.
- The trees should be respected.
- The position of the site on the edge of the village and bordering the countryside will be a matter to be planned. Therefore, it is a site with two facades, and at no time will one facade be treated as the main facade and the other as a secondary or rear facade. Issues such as porosity, transience, natural/artificial, built footprint, horizontality/verticality, compact/dispersed, will be part of the class discussions.
- Basements are not allowed.
- Roofs will be pitched.
- Priority will be given to the construction of groundfloor plus first floor, but the repetition of two identical floors will be avoided. Therefore, the groundfloor should be much larger than the first floor or vice versa. It will also be possible to propose punctual construction above the second floor if justified.
- Attention must be paid to the design of the void, (approximately 50% of the plot) the intermediate spaces between indoors and outdoors, patios, porches. Avoid isolated houses, with residual space around them.

Structure:

PART 1. HOUSING FROM THE INSIDE
Task 1: Case studies.
Prototypes of 60, 90, 120 m2 (2, 3, 4 persons).
Task 2: Aggregation patterns.
Task 3: Housing from the activities.
Storage, clothes cycle, eating area, work spaces, humid cores.

PART 2. HOUSING FROM THE SITE
Task 4: Location, environmental conditions.
Programme diagrams 1/500 + 1/200
Task 5: Programme development.
1/100 + 1/50
Task 6: Relationship between interior and exterior.
Envelope and openings. Inhabiting the envelope.
Multi-purpose intermediate spaces. Porches, pergolas, passive capture.
The exterior space.

Assessment:

The four exercises, E1 to E4, are independent and will be averaged in the Continuous Assessment. In the final delivery, the revised joint delivery of the whole project developed in the four exercises will give rise to a second grade that will be the final grade for those who choose to go to the final exam.

Class attendance (min 80%), punctuality, partial deliveries and student involvement in the sessions are fundamental and compulsory. All the documents produced can be evaluated equally.

The concepts (abstract idea or conception of the project), the procedure (adequacy of the communication strategies of the project, both graphic and oral and audio-visual, the level of knowledge in the references handled) and the attitudes (level of self-demanding of the student, the coherence of the elaboration process, the willingness to criticize and participate in the group, etc.) will be evaluated in equal parts.

Faculty:

Jaime Coll, course coordinator.
Marc Subirana, English group.
Arrate Abaigar, Cristina Jover, Nacho López, Eduard Callís, Cristina Gamboa, Arnau Sastre, Catalan and Spanish groups (all faculty members can speak English fluently).
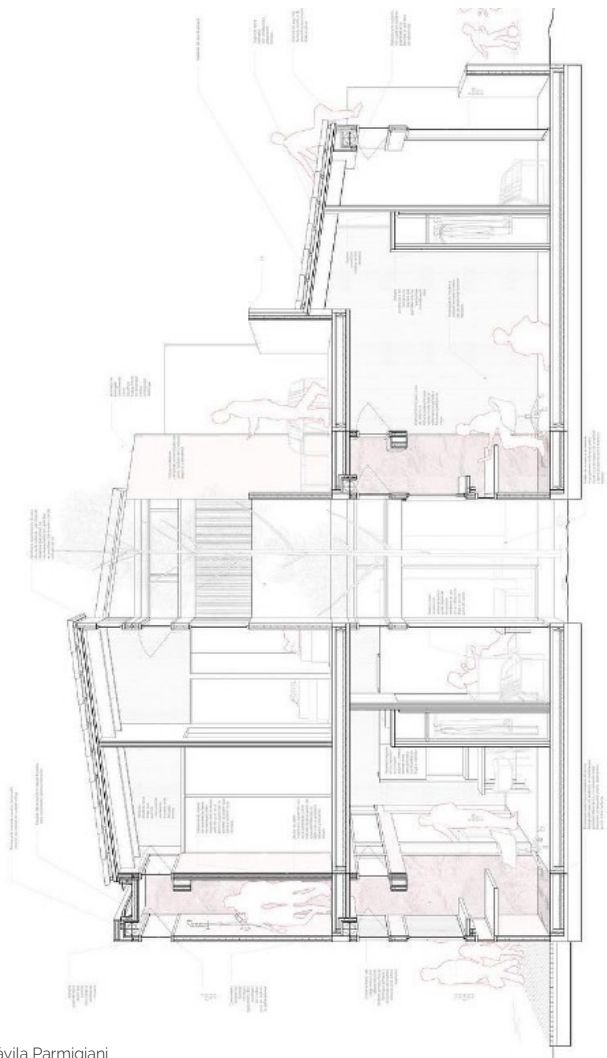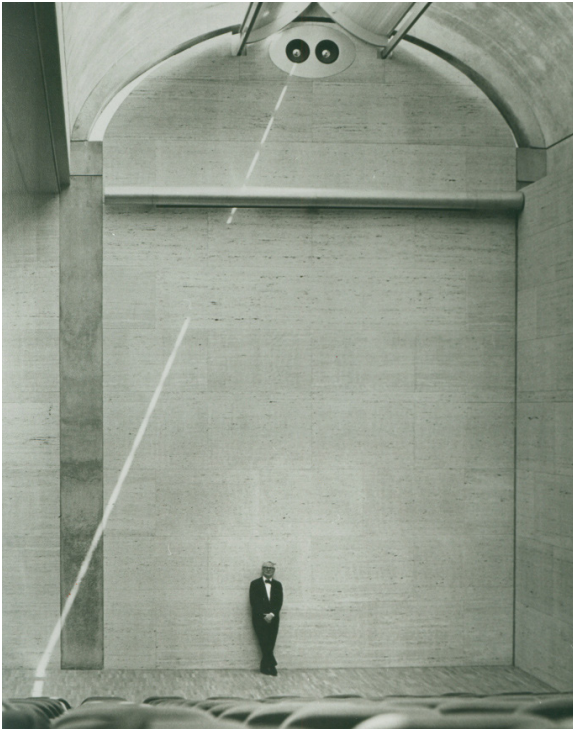
Belén Dávila Parmigiani

Sara Salman

History II
Història II

Modernity from Industrial Revolution to the Archistar System

The program is organized following a thematic subdivision in four blocks. Each session will have the first hour and a half dedicated to a lecture, while the rest of the time will be for guided debate and workshops around the requested individual paper.

We will work around the concept of 'critical history', meaning that we won't present our version of history as the only and truer reconstruction of events. On the contrary, instead, we will look at the topic with critical attitude, aimed at revealing problems, rather than pacifying them. Therefore, no idols, prophets or truths will be exposed, but authors, theorists and cultural trends.

In a School of Architecture, History is an essential component for the critical growth of the students towards a higher disciplinary maturity. Therefore, History cannot but be understood as a kind of legitimation of some type of contemporary intervention over another, nor grant eternal approval. It simply configures a territory of knowledge where critical intelligence constructs the version of the facts, using verifiable methods with criteria of plausibility, without aspiring to impose an interpretive univocity.

Lectures:

1. The arrival of the future: Modernity and metropolis. Technical changes and renewal of architectural languages.
   - London: Ruskin, Morris, Arts&Crafts, Howard, Unwin, Geddes.
   - Paris: Haussmann, Henard, Viollet-le-Duc, Art Nouveau, impressionism.
   - Vienna and the crisis of forms: Wiener Secession, Klimt, Olbrich, Hoffman, Sitte, Wagner, Loos.
   - Berlin, industry and metropolis: the Deutsche Wekbund, Behrens, Poelzig, Mendelsohn, Taut, Scharoun.
   - The architecture of the future in the United States: the Chicago School, Richardson, Sullivan, Burnham and the City Beautiful. Wright: From Prairie Houses to Broadacre

2. Vanguards: the militant Modernity. Futurism, dadaism, surrealism.
   - Russian Suprematism and Constructivism: Malevic, Lissitzsky, Tatlin, Melnikov, Ginzburg, Vesnin.
   - Formal abstraction: Dutch De Stijl: Mondrian, Rietveld.
   - First and second Bauhaus: Gropius, Meyer.
   - Le Corbusier until 1930. Le Corbusier and the unspeakable space.

3. A plural scene. Modernity in motion
   - Mies van der Rohe between Germany and United States.
   - Viennese modernity and physical culture in the American West: Schindler and Neutra.
   - GATCPAC, Tecton, Austral, TVA.
   - Italian Rationalism and the era of totalitarisms.
   Wright and the return to America of wonders.
   Alvar Aalto: the affable utopia.

4. Modernity in crisis
   - Neoempiricism, neorealism and new monumentality: Scandinavia, England, Italy after the 2nd world war.
   - Team X, New Brutalism: Aldo van Eyck, A&P Smithson.
   - Situationist drift and megastructural utopias: Debord, Constant, Tange, Archigram.
   - Louis Kahn: from the dialectic between form and design, to the sublimation of light.
   - Aldo Rossi: the city of memory.
   - Robert Venturi: the language of communication.
   - Design from New York: Hejduk and Eisenman.
   - New image and fall of the wall: Koolhaas, Gehry, Hadid.

Activities:
- Presentation of case studies that synthesise key topics developed in the theoretical sessions.
- Presentation of topics and problems for their development in collective discussion.
- Visits to exhibitions or temporary events related to the subject matter of the course.
- Interdisciplinary lectures through cinematography, aesthetic culture materials, literary reflections, etc.
- Detailed study of cases through graphic re-elaborations and three-dimensional restitutions of analytical character.
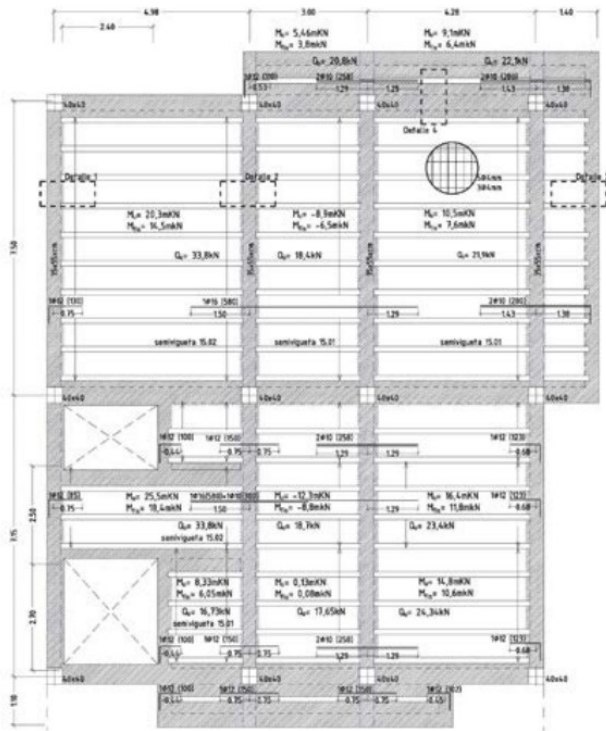- Orientation and documentary and bibliographic research of the artistic and architectural work.

Faculty:
Alessandro Scarnato, course coordinator and English group.
Antonio Pizza, course coordinator.
Arianna Iampieri, David Mesa, Guillem Carabí. Catalan and Spanish groups (all faculty members can speak English fluently).
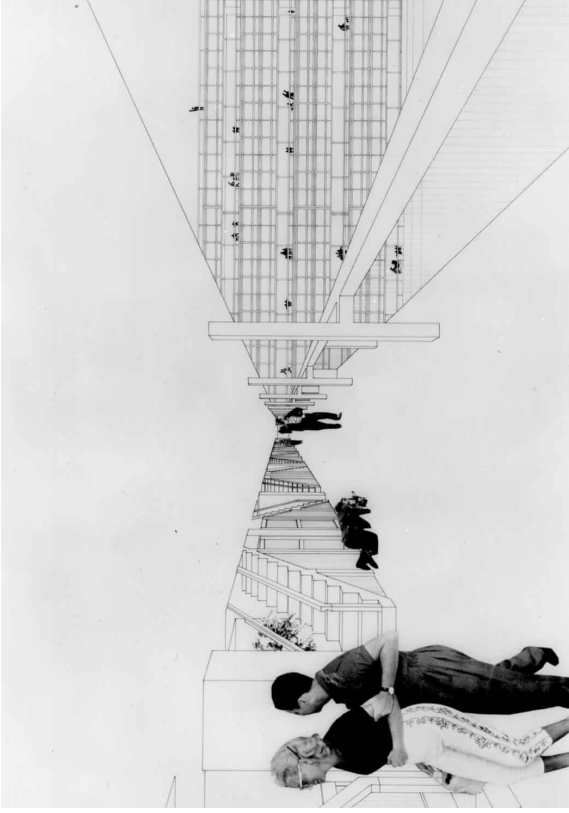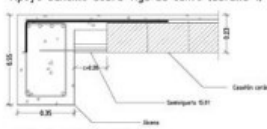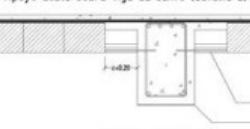
Structures II
Estructures II

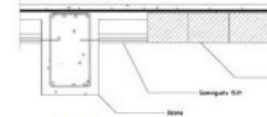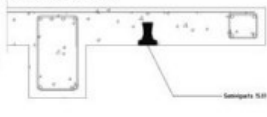Apoyo sencillo sobre viga de canto (detalle 1) Apoyo doble sobre viga de canto (detalle 2)
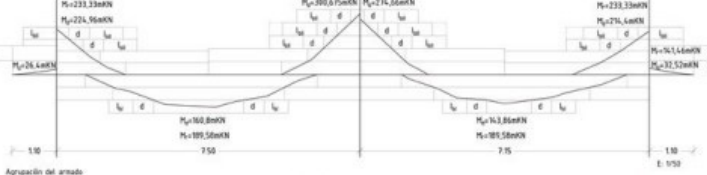
Voladizo (detalle 3) Voladizo (detalle 4)

Beam details

Armado a flexión

Despiece de la armadura en consonancia con la envolvente de momentos
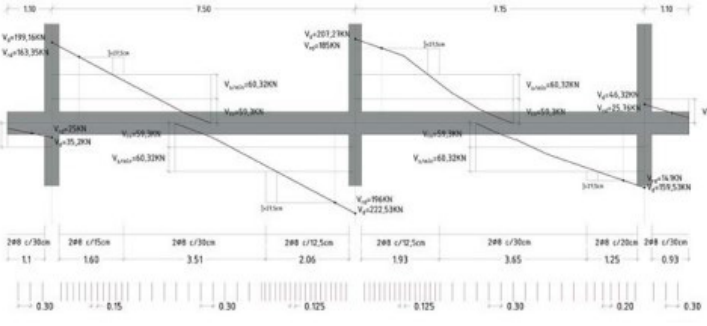
Agrupación del armado

Planta de la armadura longitudinal negativa

Planta de la armadura longitudinal positiva

Reinforced bending ↑ and reinforced shear ↓

The main objective of this course is to introduce the design of reinforced concrete structures through basic concepts about their behaviour and design criteria. The course uses a specific typology (i.e., frame structures with beam-and-block floor system) as a common thread to explain design criteria and calculation procedures.

The course focuses fundamentally on the structural typology of rigid concrete reinforced beam and one-way bidirectional columns. The teaching will emphasise the suitability and field of application of each structural typology and the relationship between architecture and structural design. The training carried out will also enable the pre-dimensioning of the main elements of the structure (pillars, girders and slabs), as well as the determination, at a basic level, of the stresses they require and their main reinforcements.

The course is developed along a common thread, the design of the reinforced concrete bar structure of a residential/office building, in which the student works from the structural design phases to the pre-dimensioning and analysis of the main elements of the building.

The student works from the structural design phases to the pre-dimensioning and analysis of the main elements that make up the framework of the building. that make up the resistant framework.

Structure:
The course will be organized with theoretical classes on Mondays and fully practical classes on Tuesdays. Theoretical classes provide an essential foundation for the design of reinforced concrete buildings. Therefore, the course will be organised as follows:

On Monday's theoretical lessons, the professor will explain the fundamental concepts related to each of the topics that are described above. At the end of these lectures, a conceptual explanation for the practice will be provided.

On Tuesdays, classes will be strictly practical. During the course we will work on the structural design of a residential building located on Avenida Boavista, in Oporto, designed by the architect Álvaro Siza.

In each session, the student will work on a specific aspect, by applying the theoretical knowledge acquired the day before. The student will solve the assignment in class, with the help and monitoring of the professor, who will answer the questions. It is important to point out that the questions asked by the students must be specific, avoiding generic questions about the subject that should be asked on Monday's theoretical lessons.

Lectures:
- Introduction to reinforced concrete structures.
- General approach to the design of structures
- Actions in building and calculation bases
- Introduction to materials: concrete and steel
- Global analysis of structures: calculation methods, concept of stiffness, determination of stresses
- Pre-dimensioning of structures. General criteria and methods for forging, columns and girders.
- Use of the Wineva software for the generation of stresses for dimensioning.
- Normal stress requirements, general calculation principles.
- Simple bending: longitudinal reinforcement of rectangular girders
- Unidirectional and bidirectional building slabs.

- Tangential bending: carving and punching.
- Compound bending: bonding and reinforcement of building columns.
- The importance of structural detailing.
- Other structural systems.

To make the most of the practical sessions, it is essential that students attend the previous lecture and read the instructions in advance.

Assessment:
Continuous assessment will be carried out based on the following milestones:

- Two midterm exams. These exams will have a weight of 75% in the continuous-assessment mark. Exam format will be explained in detail at the right time.
- Assignments (solved in class), which will have a weight of 20% in the continuous-assessment mark. The resolution of the assignment will be based on the guidelines and the explanation provided by the professor the previous day.
- Structural design competition that will have a weight of 5% in the continuous-assessment mark. Further details for the development of the activity will be provided during the course.

To be eligible for the final exam, there is no obligation to accomplish any of these milestones. In case the student had to take the final exam or wanted to raise his/her grade, the highest mark between the continuous assessment and the final exam will be considered.

To be eligible for MH Honours, students must obtain a continuous-assessment mark higher than 9.00 and must inform the course coordinator within a period not exceeding one week from the publication of the continuous-assessment marks to undertake a specific exam.

Faculty:
Lucrecia Calderón, course coordinator.
Francesc Xavier Aldabo, English group.
Francisco Javier Torre-Marin.

Alegria Garrofé

Secció 1

Tabla 1.2 Resistencia al fuego de las paredes, techos y puertas que delimitan sectores de incendio [(1)(2)]

Elemento	Resistencia al fuego		
	Plantas bajo rasante	Plantas sobre rasante en edificio con altura de evacuación:	
		$h \leq 15$ m	$15 < h \leq 28$ m	$h > 28$ m
Paredes y techos[(3)] que separan al sector considerado del resto del edificio, siendo su uso previsto: [(4)]				
- Sector de riesgo mínimo en edificio de cualquier uso	(no se admite)	EI 120	EI 120	EI 120
- Residencial Vivienda, Residencial Público, Docente, Administrativo	EI 120	EI 60	EI 90	EI 120
- Comercial, Pública Concurrencia, Hospitalario	EI 120[(5)]	EI 90	EI 120	EI 180
- Aparcamiento [(6)]	EI 120 [(7)]	EI 120	EI 120	EI 120
Puertas de paso entre sectores de incendio	EI₂ t-C5 siendo t la mitad del tiempo de resistencia al fuego requerido a la pared en la que se encuentre, o bien la cuarta parte cuando el paso se realice a través de un vestíbulo de independencia y de dos puertas.		

ESQUEMA PLANTA ALTELL

Anna Juan

Thematic Studio I
Taller Temàtic I

LAC I Laboratory of Architecture & Computation I
LAC I Laboratori d'Arquitectura Computacional I
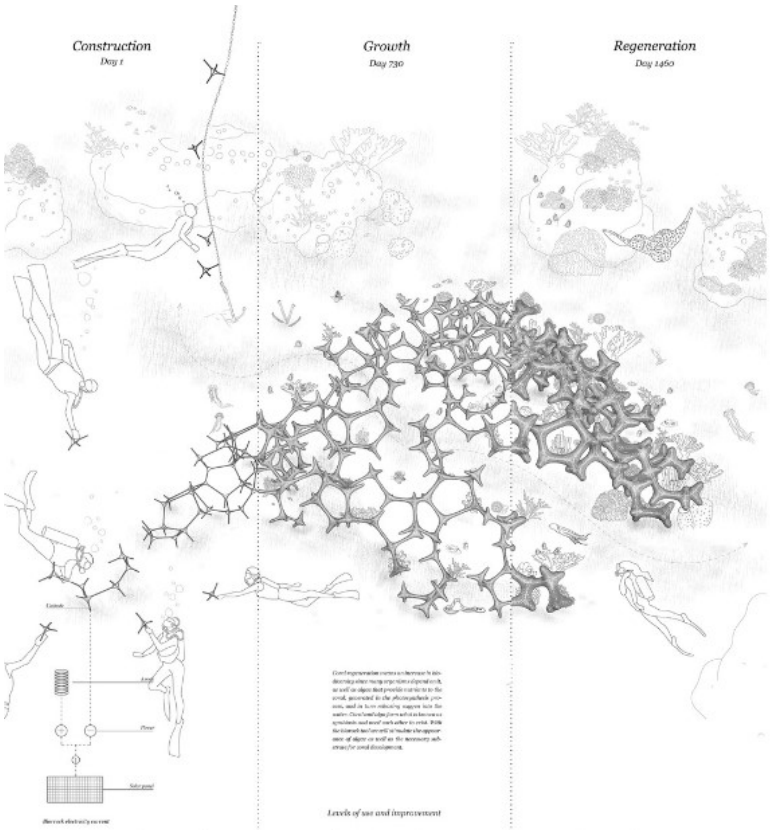
Clara Albareda + Sergio Miñarro + David Martínez

Miquel Perez + Dani Rodríguez + Alvaro Vilanova

The Laboratory of Architecture adn Computation (LAC) is a cross-thematic Design Studio between the Department of Projects (DPA), the Department of Technology (DTA) and the Department of Representation (DRA), which explores architectural design from the computation of information, through mathematical and geometric definitions, in order to generate efficient, sustainable and innovative responses.

Material information is essential, in an assay-error method where speculation and experimentation are confronted in favour of innovation in architecture. LAC relies on technique and technology to design architecture, from computation and generative design to digital fabrication tools for the prototyping of new architectural solutions with full awareness of climate emergence.

Workshop: In Corpore

The course begins with a short three-week workshop, which will explore prosthetic design understood as an extension of the body - In Corpore - or as the implementation of architecture on the anatomy in favour of new scenarios and functionalities of the human body and its relationship with the environment.

The workshop will begin with the dissection of the body and an analysis of its functional morphology in order to understand how it works, feels, perceives, moves and supports itself, to understand its capacities and limitations, as well as its relationships with the environment, the climate and social interaction and with other individuals. We will explore how from computational design we can transcend the limits of the body and propose new situations.

Students will work in teams of 3-4 members, and will be able to look at the following lines of development:
- Perception and sensoriality.
- Conditioning, relationship and mediation with the environment.
- Functionality and motor skills.

The work in this introductory workshop will be exclusively by hand, from drawing, to geometric and mathematical computation, to the design and prototyping and construction of the systems. The workshop will end in a critical session, with the presentation of the work by teams and a brief performance in which each team will show the results achieved in a live demonstration. A panel of professors, from the LAC but also invited guests, will be witnesses and will contribute with their comments to a session of critique and debate with the students on the results achieved.

Design: Living Matter

Once the initial workshop is completed, the main exercise of LAC I will begin. At this stage of the course, with all that has been learnt in the seminar sessions, the teams will incorporate the knowledge in computational design tools with the rationales and design protocols acquired in the workshop.

The exercise will begin with the empirical analysis and understanding of the capabilities and opportunities of a living material: wood. Although this material may a priori refer us to traditional systems of architraved construction, the range of possibilities that it offers still has an interesting and surprising path that allows us to research contemporary manufacturing techniques and bring new solutions to the fore. Furthermore, it should be borne in mind that the production of wood generates a positive carbon footprint, is highly energy efficient and its organic nature makes it both resistant and recyclable.

Wood is an anisotropic, heterogeneous material and often presents natural irregularities; it is also an organic and living material, which responds to the hygroscopic conditions (temperature and humidity) of the immediate environment. Its behaviour is therefore the result of multiple variables, and a correct understanding of its nature allows us to process its material information by means of computation.

The exercise will seek to work through aggregative, iterative, recursive or adaptive systems, in order to offer new solutions for structures, filters and / or walls that generate architectural spaces capable of responding to the challenges caused by climate emergence and climate change in which we are immersed. This implies taking the concept of environmental and economic sustainability of architecture to the limit, in new scenarios of environmental resilience, in more extreme and hostile futures.

The project will work from the integral design of its systems using computational design tools, through scale models, to the prototyping of construction solutions on a 1:1 scale.

Organisation:
The course is conceived as collaborative research where each individual contributes from his or her own experience and skills in development, research and work within a team of 3 or 4 students. In this same sense, the workshop itself works as an entity, where each individual, but also each team, will put their effort and work at the service of the LAC , with the aim of encouraging research in favour of innovation and progress in architecture.

Results and deliverables:
As regards the workshop, the results of both the workshop and the project will be delivered in the format indicated for each activity. In any case, it is essential that the research and results are extensively and adequately documented, and collected in a document edited in the templates that can be provided.

In the first term, the seminar will require the drawings and collages necessary to explain the fundamental concepts of the proposals that will be developed in class. Secondly, the process and the tools used to develop the project are undertaken to develop the proposal.

Assessment:
The evaluation of the workshop work will be done in relation to the results and their public presentation, but also to the group process and development, as well as the commitment and participation of each of the students.

Students will deliver the process and results of the workshop in October and will make a public and assessable presentation. The workshop qualification represents 20%
.
Students will deliver the process and results of the course project in December, when they will give an internal and assessable presentation. The grade for the project will represents 80%.

At the end of the year, the teams will have to re-file their work according to the indications given at the end of December, in the appropriate formats, and a public and assessable presentation will be made. This call will consolidate a final qualification for the course.

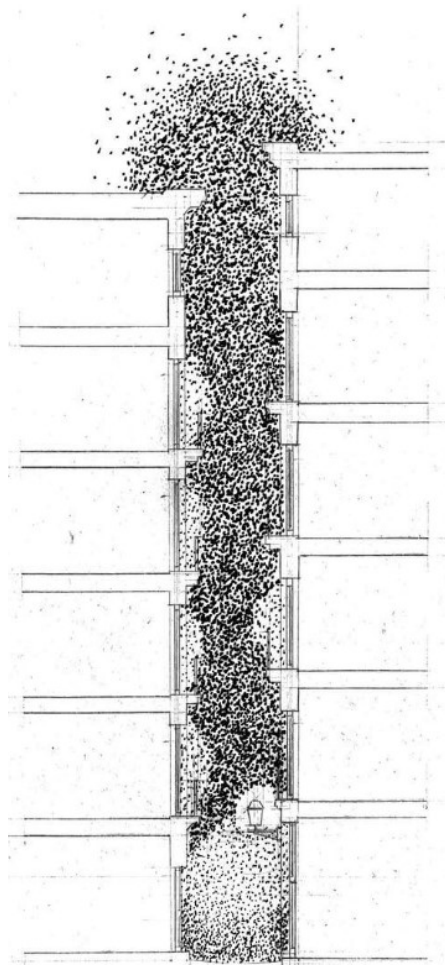**Faculty:**
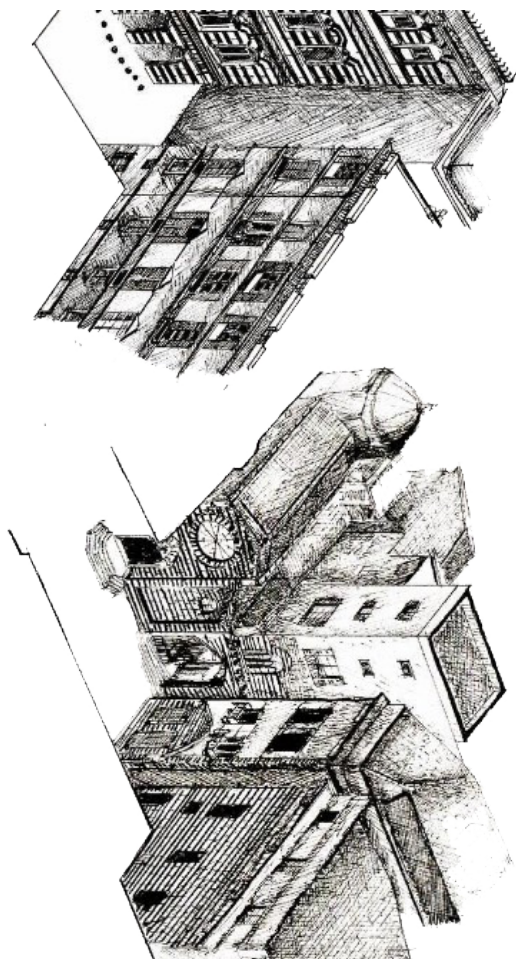Carles Sala, Relja Ferusic, Antoni Ortí.
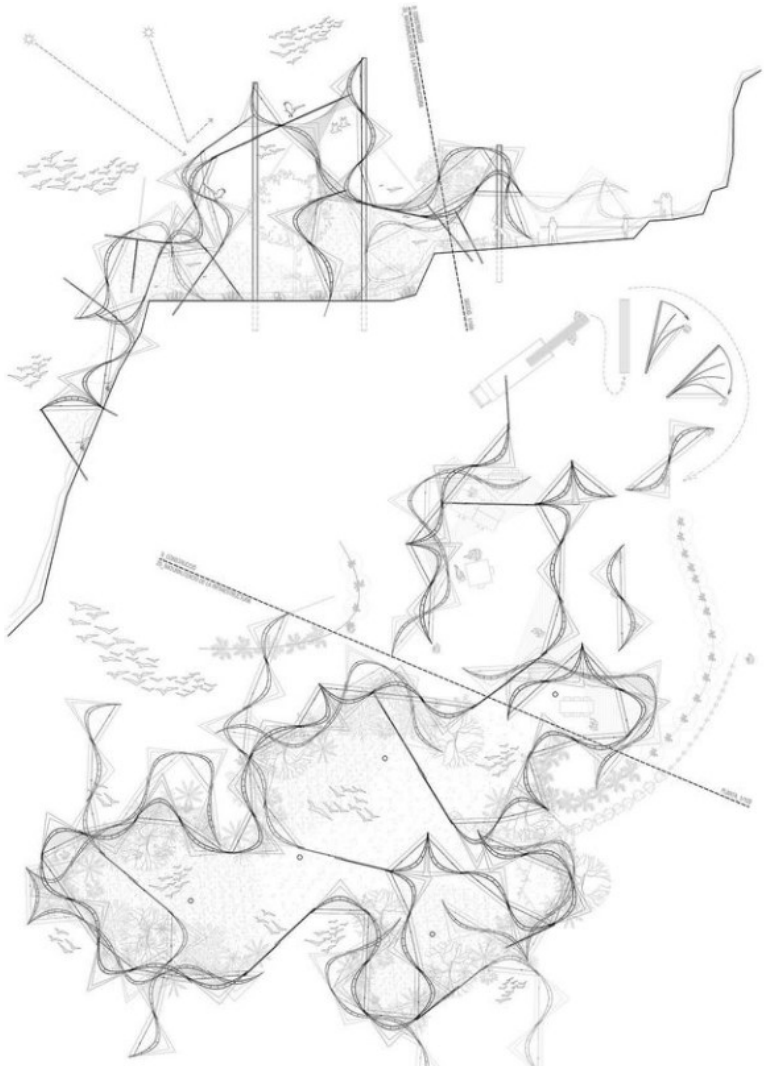
Project 'Living Matter'

LAC ETSAB UPC Students

Urban Design I
Urbanística I

Pau Olmos + Ariadna Piferrer

Paula Catafal + Ernest Cristòfol

The first subject of Urbanism begins with the reasoning about the city and progressively introduces the understanding of the complexity of the processes of urban formation and evolution.

The course has Barcelona as the object and reference for lessons and exercises, structured in four large blocks: water and light; land; raise; activity.

Each block approaches, on the one hand, to the basic elements that make up the city: streets, squares, buildings and blocks; and, on the other hand, to intrinsic concepts of the urban discipline: plot, layout, plan, ordinance, regulations. The course, fundamentally analytical, induces the critical and exploratory application of the knowledge acquired, and introduces the urban intervention triggered by the historical, morphological and sensory reading of the site.

Lectures:
The lectures deal with issues related to the reasons that have motivated the formation and transformation of cities over time, while providing an introduction to the history of Barcelona's urban form.

1. Introduction to the course.
2. At the origin of the city: land and water.
3. Ordinances: light and air.
4. Paths and streets: access and circulation.
5. Soil division: plot layout. Vila de Gràcia, Barcelona.
6. Buildings, blocks and urban fabrics (I). Barceloneta.
7. Buildings, blocks and urban fabrics (I). Eixample.
8. Buildings, blocks and urban fabric (III). 22@.
9. Public places: squares and facilities.
10. In the city. People and activity.

Tools:
In parallel to the theory lessons, the course proposes three instrumental sessions in which the representation of the city will be addressed. The sessions will have a seminar format in which specific aspects of the exercise developed in the workshop will be worked on.

1. Drawing a street
2. Modelling the city
3. Drawing the activity

Visiting Barcelona:
Three visits to the city related to the lessons and exercises are proposed: Ciutat Vella. The origins of Barcelona; Gràcia. Plots and squares; Eixample. Blocks and exceptions: passages and interiors.

Exercises:
The exercises pose precise questions about the topics discussed in class, to establish a connection between theory and practical work. To solve the exercises, various representation and analysis techniques will be explored: sketches, diagrams, literal and critical representation in plan, section and elevation, photography, models, texts.

Exercise 1: Water, air and light
The first exercise of the semester consists of analysing a street in Ciutat Vella in Barcelona whose layout responds to natural water runoff. Water, air and light are the three natural elements with which the layout, orientation and measurement of the streets condition the adjacent urban fabric.

Exercise 2: Land

The second exercise will study a street in Gràcia in Barcelona, a neighbourhood whose layout responds to a project of precise geometric division of the ground. Attention to alignments, corners, bays, sections, and plots will trigger an understanding of street geometry, resulting building types, and compositional elements related to property division.

Exercise 3: Raise

The third exercise will work on a block in Barcelona's Eixample – a project that accurately balances street layout and property management – based on a four-layered reading: the formation of the block over time; the attention to the complexity of the block, based on its cross section and the mix of uses that characterize it; the introduction to some basic urban parameters; and the intervention on an urban scale related to the previous analytical understanding of the site.

Exercise 4: Activity

The fourth and last exercise of the course has a synthetic character and will be developed in a short time. It proposes an analytical look at the activities that take place in different squares in Barcelona in order, through a small intervention, to modify the dynamics of use of the space studied. Attention to vegetation, people and the timing of the actions will guide the development of the exercise.

Assessment:

5% Questionnaires on the lectures (individual).
15% Exercise 1 (in pairs).
30% Exercise 2 (individual).
30% Exercise 3 (15% common part, 15% individual part).
20% Exercise 4 (10% common part, 10% individual part).
To pass the course by continuous assessment it is necessary to have handed in all the exercises and have answered all the questionnaires.
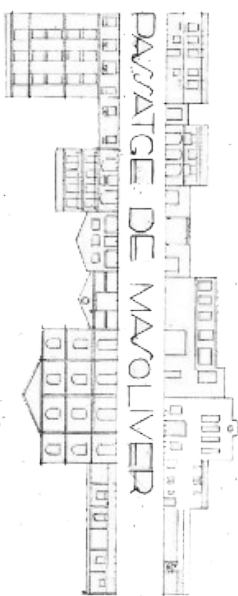
Faculty:

Eulàlia Gómez-Escoda, course coordinator.
Marina Cervera, English group.
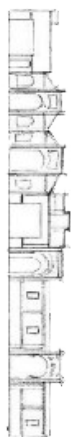Cruz Criollo, Samuel Llovet, Catalan and Spanish groups (all faculty members can speak English fluently).

C/ MUNTANER

C/ ARIBAU

C/ PARÍS

C/ CÓRSEGA

C/ CIUTAT DE GRANADA
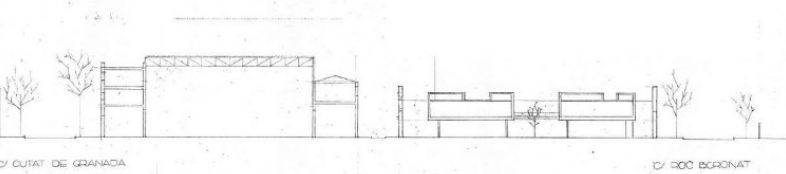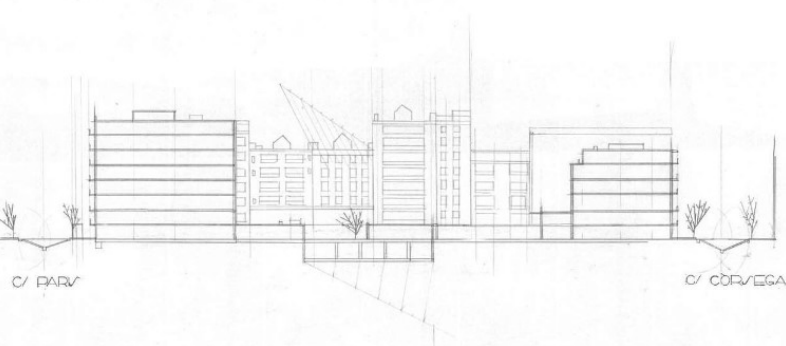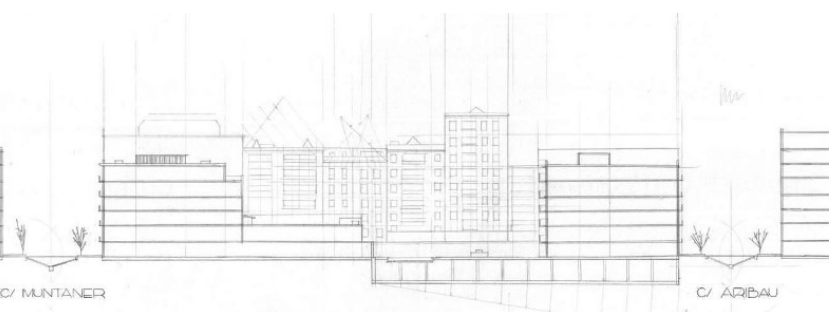
C/ ROC BORONAT

C/ RAMON TURRÓ

C/ ROC BORONAT

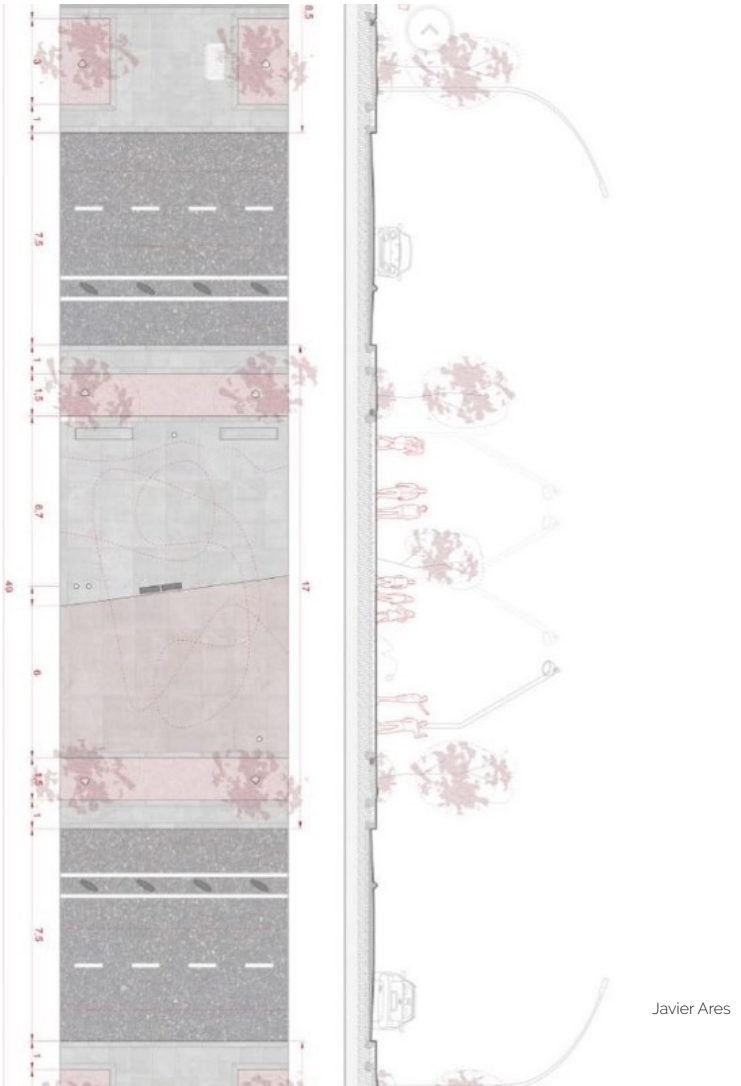PASSATGE DE MAYOLIVER

C/ LLULL

Pau Olmos + Ariadna Piferrer

Urban Design III
Urbanística III

Raquel Nualart + Guillem Pérez + Marta Roig

Javier Ares

The structure of the city. The road system, among others

Every city has a fundamental structure that allows its functioning, that is to say, makes possible its daily viability. A city can be understood as the aggregation of different parts, as we have learned to distinguish in the past course.

Now, however, we take a step forward; we focus on the fact that the parts of a city have an internal structure and are structured among themselves and within the territory according to certain specific interactions. In this way it becomes possible for each city to be a unit of meaning and use. The course is dedicated to understand these interconnections, discovering the shortcomings and proposing their best improvements.

The backbone of the city is the road system. The course presents the main concepts of street structure through lessons and conceptual exercises applied to *Une Cité Industrielle* that architect Tony Garnier imagined in the Rhone valleys at the dawn of electrification. The prodigious development of mobility since then and to date has turned the road system into a field of urbanistic, theoretical and applied discussion, which has brought about changes, traumas and opportunities in all cities. The second part of the course will be devoted to the realization of an urban planning intervention project in two nearby cities, for the improvement of their structure and functioning.

Lectures:

1. Une Cité Industrielle (1903-1917) by Tony Garnier
2. Ludwig Hilberseimer in Chicago.
3. Network and tree, two general models of structure. Accessibility vs connectivity.
4. Le Corbusier, Chandigarh and the seven ways.
5. Why Geographic Information Systems and how they work.
6. How to calibrate the deficits of the urban structure.
7. The Buchanan report and environmental areas.
8. Principles and precepts of public transport in cities.
9. From Gordon Cullen to Jan Gehl.

Exercise 1: Tony Garnier's way

The architect Tony Garnier draws a characteristic system of streets and blocks in the *Cité Industrielle*.

The exercise consists of extending 15% of the existing residential area following the same form he established. If you respect his idiosyncrasies, you can demonstrate that you have understood his way of imagining the urban structure that would suit a new city.

On a general plan 1:10,000 on paper, the exercise consists of drawing on a transparent sheet the road structure proposed by TG, interpreting the sense of its layouts in relation to the joint planning.; calculating the impact of the extension on 15% of the residential fabrics; and proposing the best layout.

Exercise 2: Applying Ludwig Hilberseimer / Chicago

As a matrix for the extension of the American city, LH developed an idea of a radically arboreal urban structure. He imagined it as an indifferent procedure, applicable to diverse geographies. He even tried to apply it to the city of Chicago by de-constructing the grids that make up the existing urban fabrics around the Loop.

We propose you to do with the *Cité Industrielle* the same exercise that LH did in Chicago. How would it be more convenient to intervene on the existing fabric in order to obtain a new tree-like structure? Notice that the result will surely be a combination where Tony Garnier's original matrix will still be very present.

In what way do you think that the tree model could increase the residential area by 15% with respect to the original size proposed by Tony Garnier?

Exercise 3: City intervention design

Real cities are the sediment throughout history of all the wills made/visited since their foundation. They are multifaceted, often unequal and unmanaged but also exciting. On a specific geography that identifies them, their structure is the result of strong and brilliant moments and periods of darkness. They are not, therefore, the product of a will in a given moment, like the dream of T. Garnier with the *Cité industrielle*. However, it has taught us the strength of the continuity of the tissues, the efficiency in articulating the different parts and the strategies for integrating the different ones. With these lessons we can approach a real city and ask the first questions from the perspective of architecture and urban planning.

From inside to outside:
In your understanding, what is the structure of this city? Could it be clearer?
Is the old town the current urban centre? What is the central city like?
The central city and the peripheral ones, in what proportion are they? Are there neighbourhoods in between?
What is each of the peripheries like? Tissues, continuities/discontinuities, untied, pathologies?

From outside to inside:
What is the regional territory like? In what ways is the country-city junction made?
How is the arterial road system? Does it serve the city well? Is it invasive? How can it be improved?
How does it work the hardening of the arteries? Where and how are the transitions?
The territorial public transport: are the bus and train stations accessible?

The city works...
... but with the same ease everywhere? Identify good streets and public spaces.
... but with which dysfunctions of the road system....
... but what are the other structuring systems of a city, what are their handicaps?
... but public transport is adequate?...
... but is it totally continuous for walking? ... ... and by bicycle?

In order to propose projects of structural improvement, what other questions could be convenient? For example: what is the importance of exceptions, monuments, geographical accidents? The other systems (free spaces, port or airport...), how can they play in favour of the city? Your questions and answers draw the urbanistic project that we ask you to do.

Assessment:

The continuous assessment is the result of the both the exercises and the design. The relative weighting is explained in each statement.

In order to pass the subject in the continuous assessment it is necessary to have handed in all exercises and notes in relation to the lectures and discussions.

30% Exercise 1 + 60% Exercise 2 (15% part I, 30% part II, 15% part III) + 10% notebook A5 theoretical lessons.

Faculty:

Josep Parcerisa, course coordinator.
Alex Gimenez, English group.
Míriam Garcia, Sara Mas, Daniel Navas, Melisa Pesoa. Catalan and Spanish groups (all faculty members can speak English fluently).
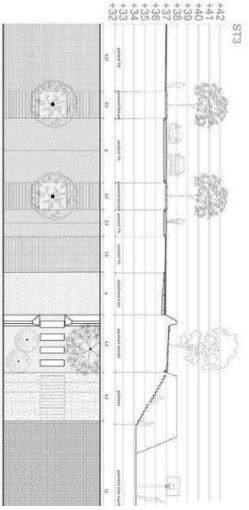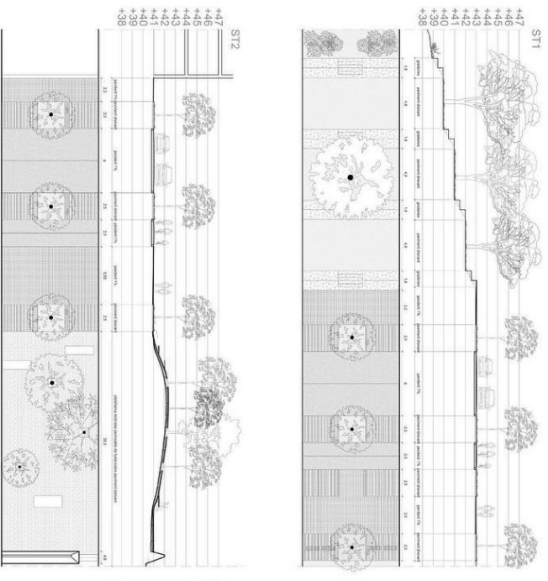
Jordi Campmany Gabarrós

Laia Garcia Palau

Urban Design V
Urbanística V

Riccardo Andreozzi + Tomasz Szymosz

Jordi Acacio + Emmanuel Durand

'Urbanistica 5' is a design-oriented course that deals with mid-scale urban projects of transformation. Following the 'lessons' of the so-called 'Urban Project' (Manuel de Solà Morales, late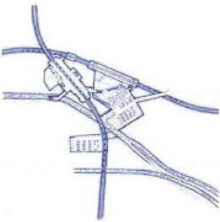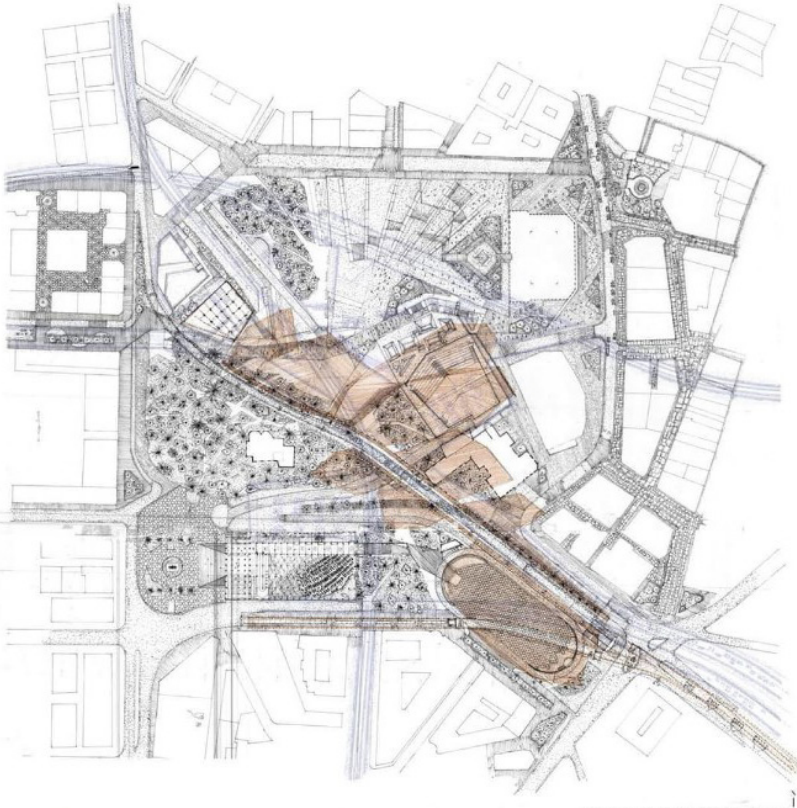 1980s) we will discuss and propose specific regenerative interventions in some urban tissues that have potential and challenges of particular interest.

Using the Urban Design tools and counting on the capacity of understanding the anatomy and physiology of every specific site, new strategic actions will be discussed and tested in order to improve the environmental, social, ecological and functional: that means, 'urban' conditions of the sites.

The main goal is to learn concepts and tools for implementing urban projects in partially occupied areas without doing 'tabula rasa'.

Here, the value of each pre-existing element has to be balanced with its scope for modernization via diverse and flexible programmes that combine housing, production, tertiary and leisure, etc. with facilities and public spaces. The urbanistic layout will be configured with planning tools (parameters, canons, regulations) as well as with the architectonic prefiguration of the main elements.

Two key aspects in this discussion are:
A) the interrelation between complementary scales of design, from buildings to city;

B) the proposed programming over a period of time taking into consideration changing requirements and stakeholders. The transformation of the existing city is almost as ancestral as the city itself. The contribution of the architect in this field is quite substantial and will continue to be so in the future because of their disciplinary capacity to integrate a number of urban variables into a coherent proposal.

This is the main challenge: to learn how to build meaningful urban projects, sensitive to their social and natural ecosystem, which evoke a certain idea of progress through their intensity, dynamism and mixed use.

Structure:
The course combines sessions of conceptual discussion with two design exercises, carried out in plenary sessions as well as in atelier groups.

Every Thursday, concepts, projects and tools related to the main topic are introduced, alternating general lessons with smaller group seminars.

On Fridays, each professor organizes the atelier dynamics based on two different exercises and three deadlines equally distributed over the 15 weeks.

Exercise 1: Regeneration and intensification of an urban fragment. Urban composition and functional mixture
The first exercise of the semester suggests an immersion into the urban regeneration project via the urban design of a city fragment made up of mix-use buildings. In a brief period of time (4 weeks) it will be discussed the composition of a mix-use urban fabric in a non-contextualized area, learning how to integrate an array of programs and buildings through variations in form and function.
The selected site has a total surface area of about 8.4 ha and corresponds to the space of a former industrial site in a privileged location, adjacent to a regional railway station. Its boundaries are clearly defined: on the north side, a park; on the south, the railway station and its esplanade; and to the east and west, the course of the river and the elevated railway tracks, respectively. The project needs to

fit new buildings and programs following predetermined proportions for housing and office buildings, workshops, retail and public facilities, etc. This also has to be done by including assertively the preexisting buildings.

Exercise 2. From peripheral neighbourhood to new fabric of innovation. Terrassa - 20th century

This autumn, Terrassa City Council has approved the Urban Agenda that defines the axes to position itself "as a capital of innovation and production, in the context of a green and sustainable, educational and creative city (…) that preserves the features of identity that defines the city: solidarity, inclusive and diverse, cultural and sportive, with fundamental values of social equity, human rights and democratic quality". With more than 220.000 inhabitants, it is the third largest city in Catalonia and, together with Sabadell and other municipalities in the Vallès plain, form a first-rate metropolitan conglomerate, with a population that exceeds 1.3 million inhabitants and a large concentration of productive, leisure and service spaces on a regional scale. On this basis, it is not surprising that this space has asked for years to have its own metropolitan area that should not depend on the Barcelona capital.

In this space of more than 70 hectares - which defines the Rambla del Pare Alegre to the west, the Montcada road to the north, the Rubí road and the splendid stream of Vallparadís to the east and the Avinguda and the N-150 to the south – the city aims to transform an old peripheral district into a new "innovative southern district", where the coexistence of more technological and clean industrial uses is allowed, together with residential and tertiary spaces.

A series of questions will guide the development of the exercise:

What needs should be maintained and what needs should be preserved from the 20th century neighbourhood for the new innovative district of the 21st century?

What models of working, of producing, of communicating is it possible to consider taking into account the strength of the metropolis from El Vallès region?

What housing demands of the city can be accommodated there?

What kind of mobility should the neighbourhood have and what infrastructures should serve it?

How to prepare the neighbourhood for the energy transition in order to make the cycle of water and materials and waste more optimal?

Which urban strategies, which urban programs, which processes and which phases?

Which projects in which spaces?

Assessment:

The assessment takes into account the two design projects and the active participation in seminars and classes as follows: First practice (20%), Seminar (15%) and Second practice (65%). Assignments will be elaborated in pairs but individual contribution in the atelier will also be evaluated.

Faculty:

Carles Crosas, course coordinator.
Robert de Paauw, English group.
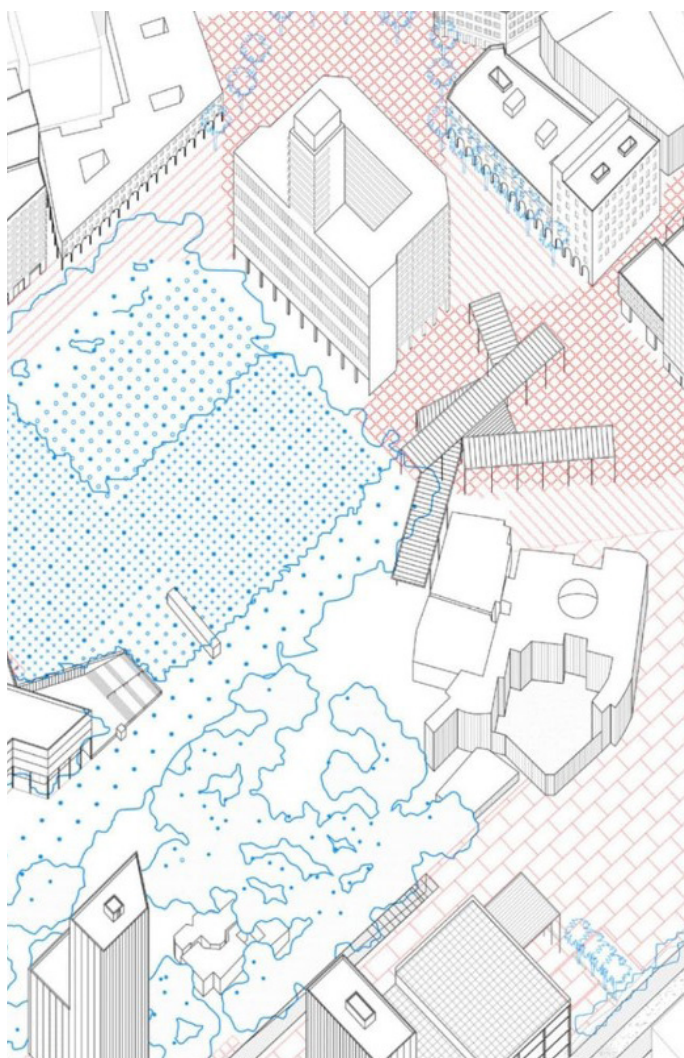Marta Bayona, Adrià Guardiet, Sebastià Jornet, Catalan and Spanish groups (all faculty members can speak English fluently).
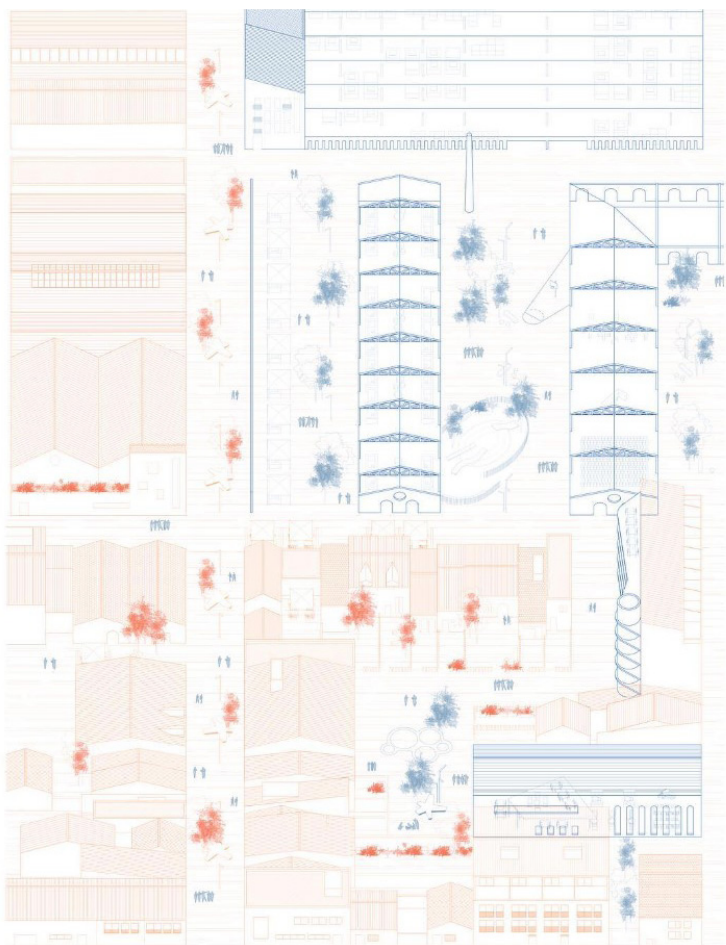
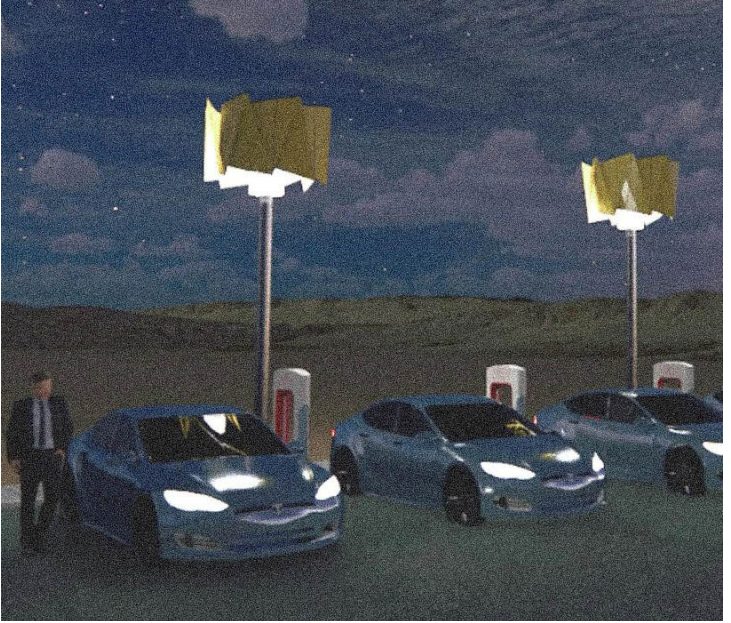Miquel Pérez + Miquel Pifarré

Maria Lopez + Miquel Martin

Adaptive Architecture, Furniture and Design
Arquitectura, Mobiliari i Disseny Adaptatiu

Teodora Dumitrasc + Antonio Llena + Liyouchen Jiang

Pol Cuartero + Helena Gómez + Yağmuray Sari

The objectives of the course focus on learning to analyse, detect and develop opportunities for improvement and innovation through design related to the built environment, with proposals based on the observation of reality.

The approach assumes the mutable and variable nature of both architecture, as a context, and the needs of users who, with changes in activity, require constant adaptation of the space and the objects they use.

The course focuses on the ADAPTABILITY of architecture, furnishings and objects to changing human needs, in different situations and in different situations and at different scales.

Lectures:
Theory and practice are developed in parallel. General thematic areas covered in theoretical sessions:

01- Social, cultural and economic context. The Mediterranean.
02- Multidisciplinary design and modernity. Bauhaus School.
03- Industry, product and market. Styling. Raymond Loewy.
04- New materials and communication. Eames Office.
05- Technology, passion and symbology. Carlo Mollino.
06- Rupture with the norms. 60'-70'. POP & Design 1.
07- From the City to the Object. POP & Design 2.
08- Matter, Image and Information. POP & Design 3.
09- Comfort, Sensuality and Functionality. Miguel Milà & family.
10- Irony, Object and Situation. Achile Castiglioni.
11- Personal experience. Some of our own designs.

Theoretical sessions provide general cultural references on the subject and guidelines for application to the project exercises carried out by the work teams.

Exercise:
Design proposals by the work teams:
- Transversal themes, centred on the human scale (object, furniture, system, personal space, urban space) as a point of intersection between disciplines.
- Proposal and theme of the work chosen by the students.
- Work in teams of three people (2 ETSAB + 1 exchange student).
- Presentation to the class in three levels of development
    1- Context and definition of the design objective.
    2- Formal / conceptual design proposal.
    3- Application/development in other cases and contexts.

Faculty:
Josep Maria Fort.

Computational Design Protocols Seminar I
Seminari Protocols de Disseny Computacional I
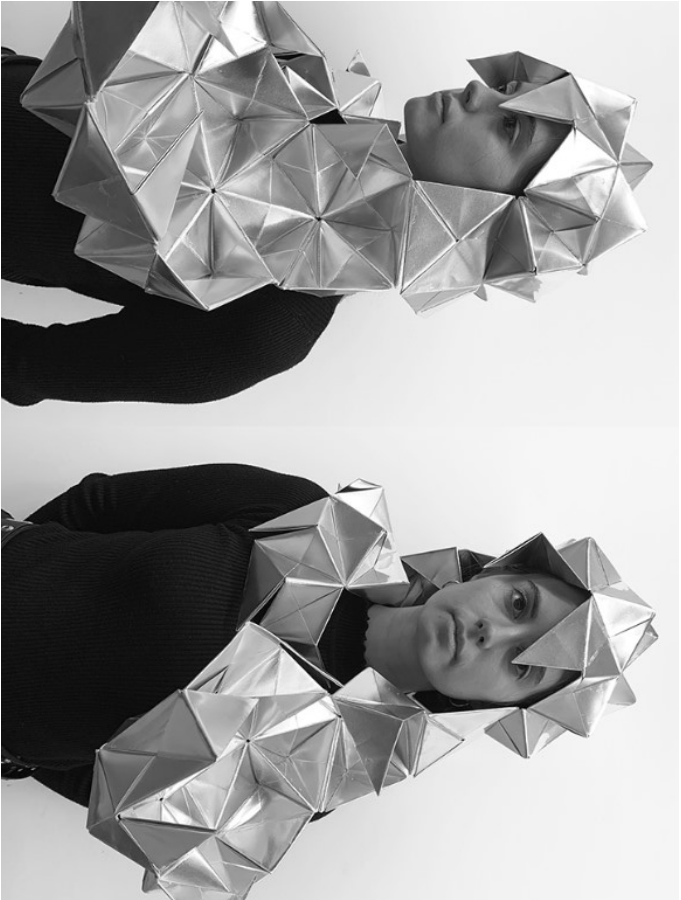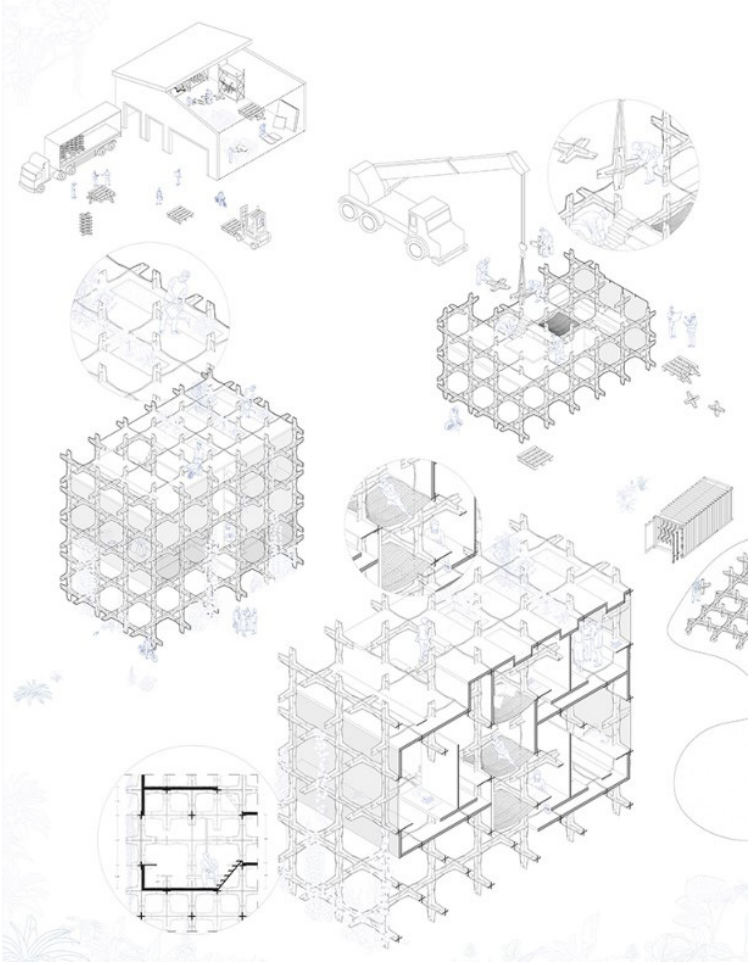
The seminar functions as a support and extension of the knowledge that will be necessary to develop the workshop work at Thematic Studio LAC I Laboratory of Architecture & Computation I. It will provide tools that will accompany the students in the process of developing the proposals.

The principle of progression of the improvement of skills and knowledge is taken as a starting point, and as a consequence, the skills of hand drawing and the elaboration of collages to develop and transform ideas from the abstract world to the concrete world of architecture will be strengthened.

In a second stage, these ideas will be worked with computer tools to develop complex geometries such as parametric, fractal or fragmented systems. The next step will be to develop these proposals with computer systems, using them in the most appropriate way to find the solutions to the ideas put forward. solutions to the ideas put forward.

Students will work individually and in teams of 3-4 members.

Theoretical Framework:
The drawing of the Renaissance / The avant-gardes

From modernity to post-modernity
   Structuralism / Processes as art / Dematerialisation / The influence of the subconscious on processes / Fragmentation / Minimalism / The digital world

The process of creation
   P3 Architecture / Approximations

The place and the non-place
   Creation of ideas / Elaboration of the ideas and the dialogue / Working tools

Drawing the uncertain moment of creation
   Drawing by hand / Collage

Fundamental   concepts   of   knowledge   to   develop computational geometries
   How to dimension a croissant / Drawing complex geometries / Parametrisation, a tool to help the creative process

Physical models and models
   Materials / Geometric generation / Laser printers / 3D printers / Construction of models scale 1:1

Assessment:
   Attendance will be required both for the hours devoted to the resolution of questions and for the more conceptual or theoretical topics to be dealt with, always with a direct application to the students' proposals. This will be 40% of the final grade. The remaining 60% will be defined by the suitability of the tools and the resolution of the proposals linked to the studio. Qualification will be group-based as long as individual attendance and follow-up are appropriate both to the pace of the classes and to the group work.

Faculty:
   Lluís Giménez-Mateu, Salvador Gilabert.

The course is proposed in collaboration with a prestigious European architecture school (in the past it has collaborated with the ETH Zurich, TU Munich, or TU Graz, among others) or with the occasional participation of professors from various foreign schools.

The interest of the course does not lie in the specificity of the project that the students have developed (which will try to solve a real problem of the UPC in one of its campuses), but in the teaching methodology undertaken.

The exchange and contrast of experiences, approaches, knowledge, etc... between schools is, without any doubt, enriching: it puts students and teachers in contact with other ways of approaching the project and understanding architecture.

The project to be developed by the students is not an end in itself, but it becomes the vehicle for this exchange that we find so enriching.

No travel is foreseen: the relationship between students and guest professors from abroad will take place by inviting them to the ETSAB or by videoconference.

Assessment:
The continuous assessment will be based on the work that students will develop during the course, by means of the delivery of work or written and/or oral tests, according to the criteria and calendar established. written and/or oral tests, according to the criteria and calendar established.
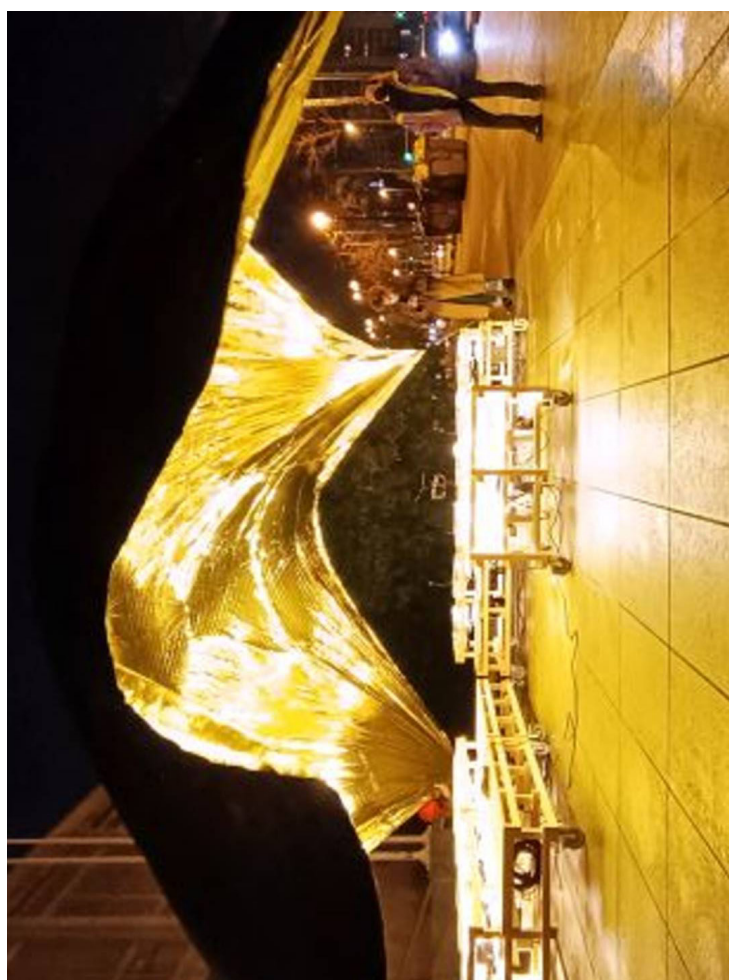
Faculty:
Oscar Linares, Àngel Solanelles.

Llum Barcelona: Light Arts Festival
Llum Barcelona: Festival d'Arts lumíniques

Llum Bcn ETSAB 2020

Llum Bcn ETSAB 2022

ETSAB participates every year in the festival *Llum BCN* in the Poblenou neighbourhood of Barcelona.

The school is represented in this event by a team of students, who will design and build with their own hands a light installation for the festival, which will take place in February.

LlumBCN started in 2012 as a small urban lighting festival with the aim of highlighting the beauty of the city's buildings. Poblenou is a neighbourhood with a low population density, with an industrial past that has generated large empty spaces, many of which are currently inhabited by young people, universities, cooperatives, etc.

Through the experience of the 2012 and 2013 editions, the need arose to dynamize the idea of monument and the urgency to involve the public by offering them an experience of the city and a new nocturnal landscape; to trace a route through the city to propose to the visitor known scenarios but as a new experience; to offer a part of these spaces to students from schools of Architecture, Art and Design to make and execute light proposals (each school is assigned a different space and an equal budget and also a deadline to present a project at the festival).

During four-months, team work sessions are planned: from concept, to experimentation, debate and project. According to the calendar established by the Institute of Culture of the Barcelona City Council (ICUB) it will be necessary to complete the two project deliveries until its executive development and definition. During the intensive week it will be necessary to carry out the assembly, the whole team, of the proposed installation and take it to its realization, which will later be installed in situ for the festival, in Poblenou, Barcelona.

Assessment:
The continuous assessment will be based on the work that students will develop during the course, by means of the delivery of work, according to the criteria and schedule established.

Faculty:
Félix Solaguren-Beascoa, Nacho López.

Walking Barcelona
Caminar Barcelona

Sangwoo

Claire Deygout

Walking the neighbourhoods of Barcelona is a teaching experience that, beyond the physical limits of the classroom, aims to develop the perception of urban space and its transformation through guided tours through the metropolis. The aim is to bring us closer to the history, the social landscape and the construction of the urban heritage of the different neighbourhoods. An attitude close to the analytical look of the explorer or the "surveyor" that seeks to integrate documentary knowledge and direct experience of the places. Also to the more personal approach of the drift of the passer-by, "flâneur" or "wanderer", to take advantage of the urbanism workshop that Barcelona consitutes, and to incorporate new images and urban experiences to the baggage of the architecture student. It is proposed a work of interpretation of the city from building a "Map" of each itinerary.

It is important to experience the tangible and perceptible reality of the city, not to forget the instrumental condition of the multiple analogue or digital media at hand. A recurrent challenge of architecture and its learning.

Structure:
1. Presentation
2. Ciutat vella / Carrer Ferran and Plaça Real / Sta. Catarina market
3. Port vell / Barceloneta / Moll de la Fusta
4. Raval / MACBA and CCCB / Hospital / St. Antoni
5. Barcelona litoral / Vila Olímpica / Parc de les Dunes / Fòrum / Besós
6. Eixample central / Fort Pienc / Editorial GG
7. Districte 22@ / Glòries / La Escocesa
8. Seminar
9. Gràcia / Turó de la Rovira / Park Güell
10. Vall d'Hebron / St. Genís dels Agudells / Montbau
11. Rec Comtal / Montcada / Vallbona
12. Montjuïc / MNAC / Fundació Miró
13. Seminar

Faculty:
Álvaro Clúa, Jordi Franquesa, Pablo José Martín, Josep Parcerisa, Isidre Santacreu.

CORE COURSES

	M	A	1	2	1	2	3	4	5
Architectural Representation III**	●	○	○	●	○	○	●	○	○
Design IV	●	○	○	●	○	○	●	○	○
Thematic Studio II -LAC II*	●	○	○	●	○	○	○	○	●
Urban Design II	●	○	○	●	○	●	○	○	○
Urban Design IV	●	○	○	●	○	○	●	○	○
Urban Design VI	●	○	○	●	○	○	○	●	○

ELECTIVES

	M	A	1	2	1	2	3	4	5
Digital Fabrication Systems Seminar*	●	○	○	●	○	○	○	○	●
Mallorca Collage***	●	○	○	●	○	○	●	●	●
Material, System, Prototype	●	○	○	●	○	○	○	●	●
Territory and Landscape	●	○	○	●	○	○	○	○	●
Urban Notes	●	○	○	●	○	○	●	●	●
Walking Barcelona**	○	●	○	●	○	○	●	●	●

* both subjects require joint enrolment
** this course is also offered in the fall semester
*** intensive course: mornings and afternoons

Architectural Representation III
Representació Arquitectònica III

Meritxell Martinez

Carla Mañé

Zhoueng Zhang

Architectural Representation III focuses on the visual simulation of models and urban and architectural designs. Because of the quick evolution of architectural rendering software, fuelled by the progress in both software and hardware through the innovations from the videogame industry, during the course multiple software is employed in the different groups: non-real time renderers (V-Ray, Corona, Blender), real time renderers (TwinMotion, Enscape, D5), and modelers (3DS Max, SketchUp, Blender). This variety of software has the objective of illustrating the strengths and weaknesses of the different options, and encourages learning multiple alternatives to adapt to different and changing circumstances.

The course is structured in three thematic blocks of roughly the same duration of one month, depending on the specific available dates during the academic year. While the three blocks are independent and focus on different aspects of the curriculum, they are related because they share the same urban setting around which the course is structured.

At the beginning of each block the task statement of the exercise to be developed is provided, along with supplementary material that may be required. During the development of each of the block the required concepts are introduced and explained, following examples that are developed in the classroom and projected onto the screen. These lessons are also supported by material in PDF format and recorded videos. As each block is developed, the format of the classes gradually phases to an eminently practical and applied format, where the students develop their proposals with the support of the instructors.

First block:
The first and initial block focuses on the visual simulation of an urban proposal consisting in the articulation of modular dwellings within its urban context, in coordination with the Urban Design course of the same year. The objective is learning the basic operation of the software that will be used during the course: management of digital models; lighting simulation in daylight and night-time situations; inclusion of vegetation, urban furniture, and virtual characters; topographic manipulation; production of model cut-outs and elevations; and presentation of the results. In this block only (near) real-time render engines are used, and the complexity of colour and texturing is not yet introduced, generating only monochrome volumetric studies.

Second block:
The second block focuses on a photomontage, and consists of integrating a virtual digital model within a photograph of an urban context. The objective is understanding the capture of a snapshot of reality and replicating the process digitally: matching the perspective and point of view from the vanishing points of orthogonal pairs of parallel lines in space; learning the operation of a physical camera and its virtual counterpart; estimating and matching the sun position; replicating the sun and sky contribution to lighting; integrating the virtual model using simulated shadows, reflections and indirect lighting; post production and layering to achieve the final composition.

Third block:
The third and last block focuses on the realistic simulation of an interior or interior/exterior space, achieving the maximum quality that modern render engines are capable of. The students are provided a model of an architectural space where they must define realistic materials and accurate lighting, placing objects according to the intended use and establishing the point of view of the image to explain the architectural or urban proposal. In this block the students can also produce a rendered image of the project that is

developing in the Design Studio course in the current academic year.

Additional exercise:
Finally, there is a complementary exercise that is not compulsory to deliver to receive a passing grade but contributes a small amount to increasing the final grade, which consists of a video animation of the proposal, taking advantage of the increased speed in modern rendering engines to produce video content in a short amount of time. The video can include camera movement, changes in sun position, whether effects, animated persons and vehicles, moving architectural elements like opening doors or revolving fans, and even contextual audio.

Assessment:
During the last week at the end of each of the blocks, the work developed by the students is delivered electronically in the Atenea platform, and a practical exam is conducted focusing on the most crucial aspects explained in each of the blocks.

In addition, the deliverables of the first and second blocks can be improved and re-submitted for evaluation until the end of the course. If all the blocks are passed, the students attain a passing grade for the course (continuous assessment). After this evaluation, there is a final exam that the students that have not obtained a passing grade or have not been able to follow the course can conduct. Furthermore, the students with a passing grade can also opt to increase their grades in this exam, and their final grade will never be lower than the one attained by continuous assessment.
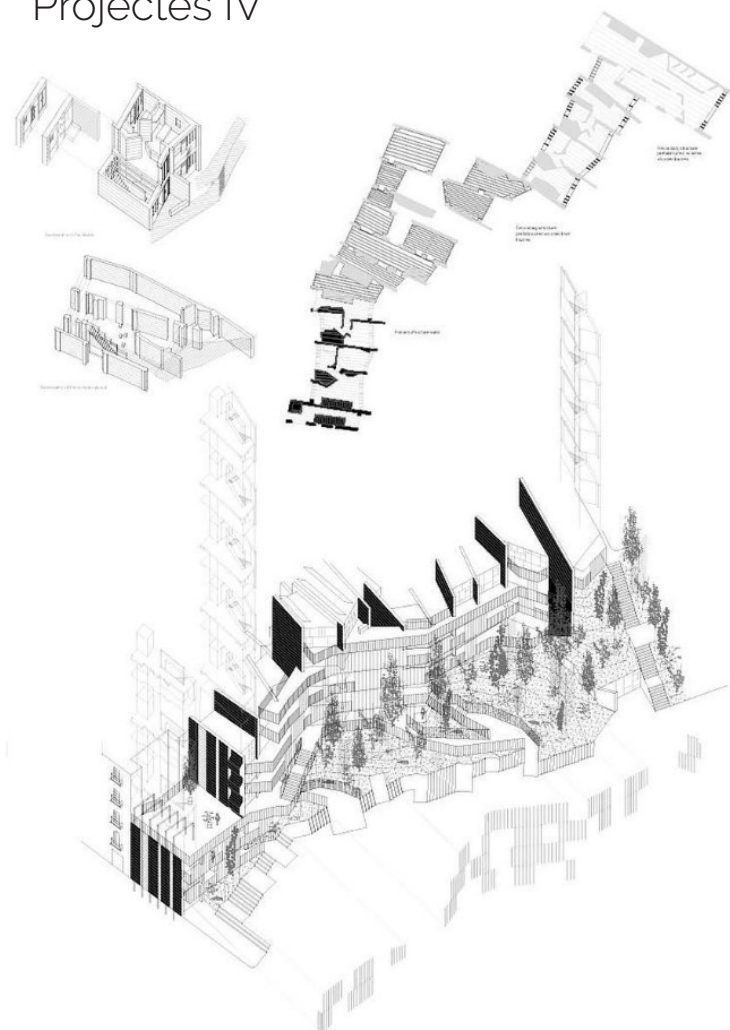
Faculty:
Francesc Valls, course coordinator and English group. Albert Marin, David Martínez, Ernest Redondo, Alberto Sánchez, Juan Ignacio Valgañón. Catalan and Spanish groups (all faculty members can speak English fluently).
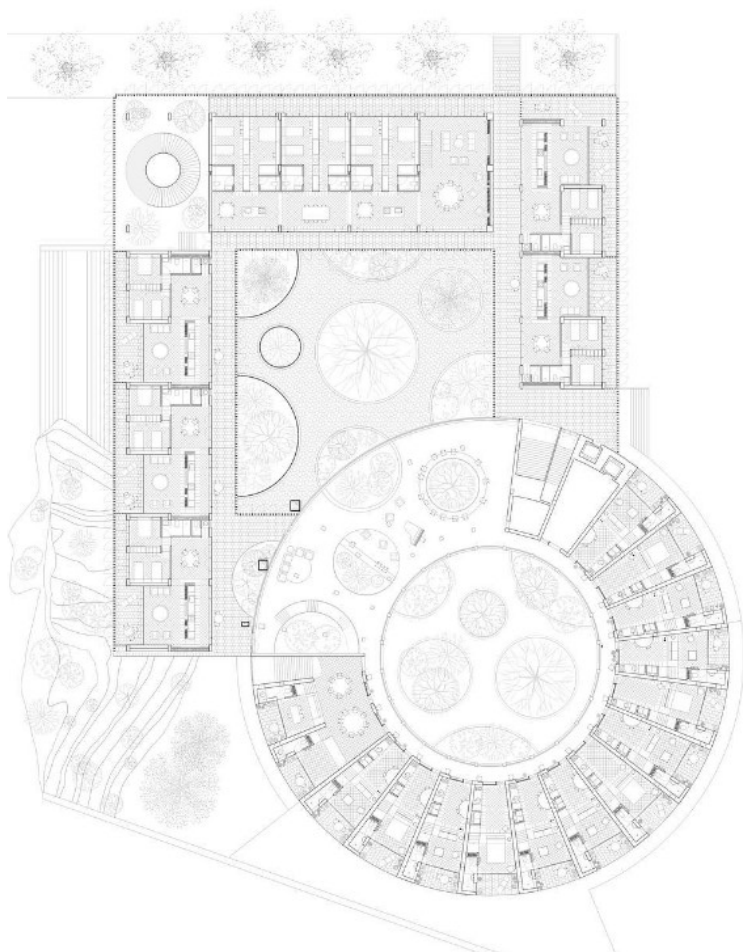
Nerea Dominguez

Meritxell Martinez

Paula Pagès

Design IV
Projectes IV

Belen Davila

Pablo Navarro Butron

Design Studio IV continues and complements the course Design Studio III, which worked on HOUSING FROM INSIDE and moved on to the study of HOUSING FROM PLACE.

Design Studio IV reverses this process and starts with the PLACE, studying the site and its relationship with the URBAN (the built environment), the SOCIAL (public space, the commons) and the NATURAL (landscape, topography and environmental conditions) to move on to the development of the programme (a residence for a community of artists studying or working in the Alfama neighbourhood in Lisbon) and typologies.

New ways of living:
The last two crises, the economic crisis in 2008 and the health crisis in 2020, have brought a change in habits: a new culture of sharing (car, home exchange, crowd-funding), demographic changes (the traditional family is no longer the only form of cohabitation), and a return to urban life (as opposed to suburbia) and vice versa.

This change has provoked a search for new typologies and programmes in contemporary domestic architecture, which can be defined as a search for an architecture of the collective that develops on three levels: [1] the dwelling, with "cluster" apartments, where a number of them share living spaces; [2] the building sharing services, recovering the circulation spaces as social spaces and, above all, the roofs as ecological leisure spaces; [3] the relationship of the environment, whether natural or urban, with the neighbourhood, absorbing certain uses or public facilities (passages, commerce, work spaces).

Location:
In Lisbon the exception is the rule. The city sits and grows conditioned by the topography of valleys and hills. Viewpoints, stairways, shapes and stories that surprise at every corner, characterise the experience of strolling through its oldest streets.

In Alfama, water supply through wells and fountains, sanitation infrastructures, lighting, accessibility and waste transport are historical issues that take on special relevance in contemporary times. The architectural integration of a response to the climatic emergency that we are experiencing involves addressing these aspects, as well as the management of water, energy and waste. In the Pátio Dom Fradique, being a representative fragment of the neighbourhood, we find the topography, the views and the ruins as strong conditioning factors to be taken advantage of for the environmental response of the project. Inhabiting the dense and historic city in a sustainable way requires attention to the pre-existence and combining the formal architectural response with the culture deposited.

Conditions:
The studio will work on housing with shared spaces. The aim is to explore a programme between shared student housing (conventional apartment) and university residence (closer to the aparthotel), taking as a reference, residential communities for young people who share living, working, studying and leisure who share living, working/studying and leisure spaces.

Housing for young people will therefore cover a diversity of needs and different types of users (students, researchers, artists in residence, teachers and guest lecturers...) between the ages of 18 and 35, a time of transition from family life and adult life.

The stay, between 1 and 5 years, is characterised by an intense social life in community.

Mixed housing building for young people with common spaces (services, work and leisure spaces).
Maximum number of people: 56
Maximum floor area above ground level: 1.905 m2
Ratio approx.: 25 m2 built / person

Structure:
Part 1. Housing from the place.
   T1. What is the place like? Redrawing of the cartography and model (in pairs).
   T2. Strategies for fitting in place. Volumetry (individual task)
   T3. Internal relations 1. Circulations and cluster typology.

Part 2. Housing from the inside. Internal relationships 2. Circulations and cluster typology.
   T5. The activities of living.
   T6. The behaviour of the envelope.

Assessment:
If the course has been followed (minimum 80% attendance), and all the deliveries have been handled, it will be assessed in the tutorials of the last week of the term through the 3 deliveries handled.

Physical class attendance (min 80%), punctuality and partial deliveries are fundamental and compulsory, as the topics treated are not repeated from one session to the next. from one session to the next. All the documents produced are assessable.

Concepts (abstract idea or conception of the design); procedure (appropriateness of the design); adequacy of the communication strategies of the design (both graphically and orally). level of knowledge of the references used and the attitudes (level of self-demandingness of the student, coherence of the elaboration process, willingness to criticise and participate in the group, etc.).

Final evaluation.
GROUP 1. Those who have followed the course and completed all the partial deliveries and their grade is higher than 4.0: All the partial deliveries must be uploaded to Atenea.
GROUP 2. Those who not reach 80% attendance, they have not done some partial deliveries or the grade is lower than 4.0. They must follow the "Final Delivery" list.

Faculty:
Jaime Coll, course coordinator.
Marc Subirana, English group.
Arnau Sastre, Arrate Abaigar, Oriol Ferrer, Cristina Jover, Màrius Quintana, Toni Vidal. Catalan and Spanish groups (all faculty members can speak English fluently).
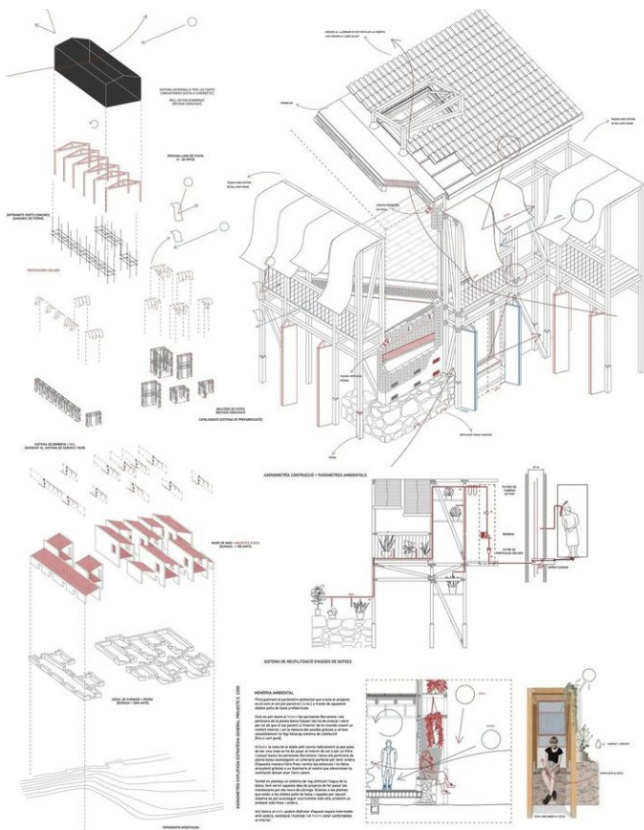
Alejandro Cáceres

Guillem "Wesel" Fernandez Otalora
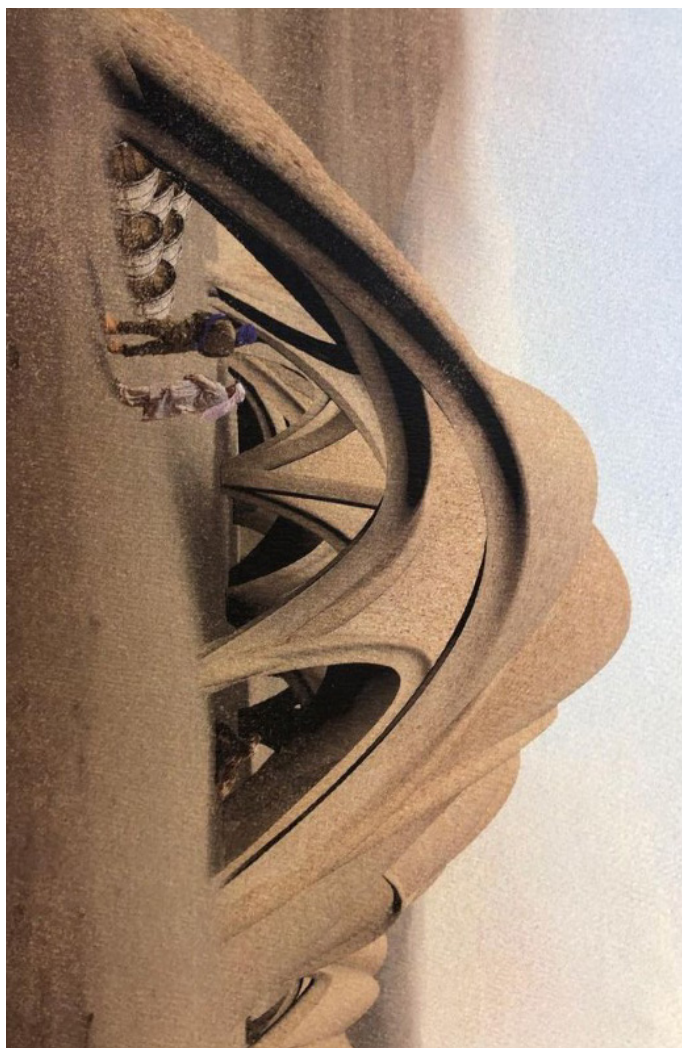
Thematic Studio II
LAC II Laboratory of Architecture & Computation II
Taller Temàtic II
LAC II Laboratori d'Arquitectura Computacional II

Design 'In-Form'

Emmanuel Durand + Jordi Acacio + Arnau Toscano + Toni Huget

LAC is presented as an annual course, divided into two terms, where the first term will focus on Computational Design and the second on Digital Fabrication, without neglecting the evident and necessary relationship and transition between one and the other. In any case, the approach and the programme will ensure that students who choose to take either of the two terms independently will be able to do so. Each four-month period will place students on the same starting line, while guaranteeing the achievement of specific objectives in each four-month period. In the same way, those students who so wish may take the two terms as a single course with programmatic continuity: LAC I - Computational Design (1Q) and LAC II - Digital Fabrication (2Q).

The Laboratory of Architecture and Computation (LAC) is a cross-thematic Design Studio between the Department of Projects (DPA), the Department of Technology (DTA) and the Department of Representation (DRA), which explores architectural design from the computation of information, through mathematical and geometric definitions, in order to generate efficient, sustainable and innovative responses.

Material information is essential, in an assay-error method where speculation and experimentation are confronted in favour of innovation in architecture. LAC relies on technique and technology to design architecture, from computation and generative design to digital fabrication tools for the prototyping of new architectural solutions with full awareness of climate emergence.

Introduction:

Antoni Gaudí, Buckminster Fuller and Frei Otto, three different architects belonging to three consecutive generations, explain very well how we can acquire knowledge and apply it to architecture by observing the optimisation systems that nature itself uses, both in living beings and in the real world.

Architecture is not a linear or deterministic process, but must be understood from the integration of design, form or material with structural, construction and manufacturing systems, with the consideration that the creative process presents emergent situations and gives way to new solutions. The work and experiments of these three architects (study of pure compressive traction with inverted models of catenaries, analysis of minimum surfaces with tile models, discretisation of the spherical surface in a geodesic geometry...) were the precursors of computation (non-computer computation) as a way of analysing and discovering shape.

The computation that we now have at our disposal is therefore a very powerful tool that allows us to integrate all the phases of design into one, and to open up scenarios for new models of adapted and sustainable production. It is in this spirit of laboratory research, and under the new paradigm that computation and digital fabrication raise, that LAC opens this space at ETSAB in the form of a Thematic Studio for experimentation and emergence of new forms and systems of design and construction in architecture.

LAC is a laboratory, the aim of which is, in the first instance, to identify specific and precise information, collect it, manage it and process it. Through technology it is necessary to establish systems, processes and networks that allow us to visualise the information, while providing multiple appropriate responses, thanks to algorithmic, mathematical and geometric programming in an approach to generative and parametric design. The design has to be subjected to digitally simulated but also analogue simulations, in a disciplined and systematic way, accompanied by adequate documentation in order to be able to speculate,

experiment and conclude with optimal solutions. Through project-oriented computational design, LAC explores from specific information (also in real time) and Big Data, to offer architectural solutions based on light structures, aggregated systems (components and unions), complex but optimised geometries and logic based on mathematics and physics.

LAC looks at traditional materials from a new perspective, and considers the cycles of materials to be used (recycled and recyclable), organic materials (wood, cellulose-based materials...) and new materials; understanding them from their mechanical behaviour and programming them in new ways to respond to stress, through analysis and design.

LAC wants to establish an integrated, fluid and agile dialogue between computational design and digital manufacturing, through prototyping, with full confidence in the new manufacturing techniques, both additive (3D printing) and subtractive (numerical control CNC cutting systems), or training techniques (thermoforming, folding...), to offer full confidence in the new manufacturing techniques.), in order to offer full efficiency in the construction process, and adapt it to the context without harming the environment, on the contrary. The final objective of the LAC is to deliver a space built on a scale of 1:1, within the ETSAB, as a coherent format of the Thematic Workshop.

Workshop: 'Make to Make'
The course begins with a short three-session workshop, which explores the design and digital fabrication from the process of making a container through a technique, a stri or a tool. This piece, which can be found all over the world, in all times and cultures, allows us to deal with the dual interior-exterior condition, at the same time as it allows us to consider the mechanical and manufacturing properties.

The result therefore emerges as a response to a material, a technique and a manufacturing process, where the design of manufacture, where design and manufacture go hand in hand.

Design: 'In-form'.
The exercise starts from the opportunities of the material, the technique and the manufacturing process. The student speculates on new manufacturing systems and new construction solutions to propose an architectural space.

The design process starts from the properties of the material and its capabilities, once it has undergone a process of manufacture and manipulation. Experimentation with the material and the technique opens the way to new the way to new scenery and architecture in an environment of climatic emergency.

For information on Results, Deliverables and Assessment, see in this guide Thematic Studio I - LAC I Laboratory of Architecture & Computation I

Faculty:
Carles Sala, Relja Ferusic, Antoni Ortí.
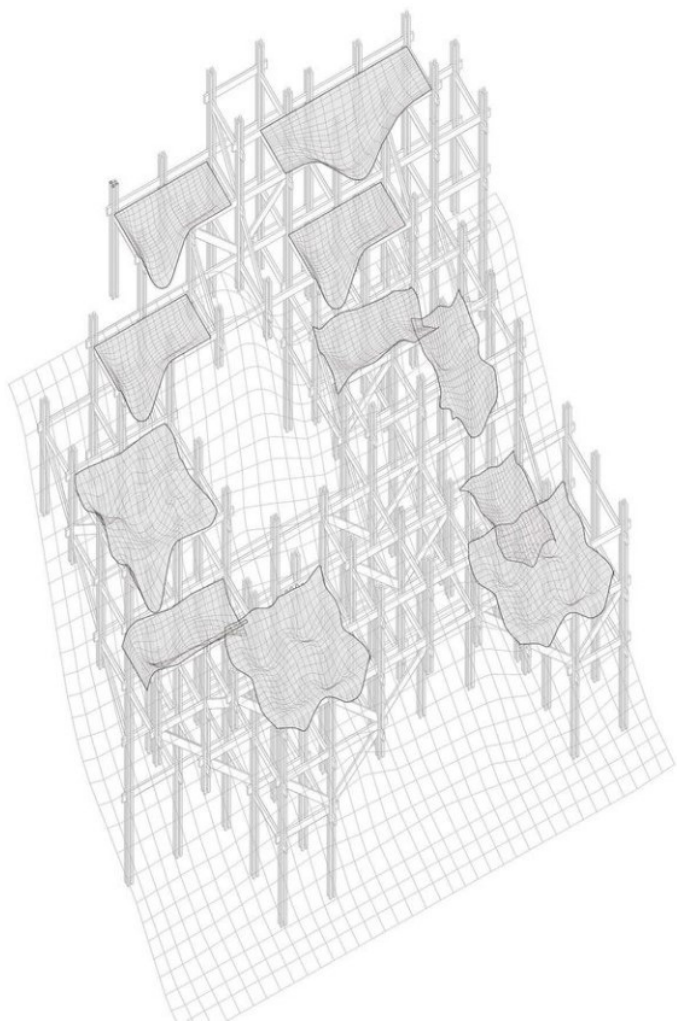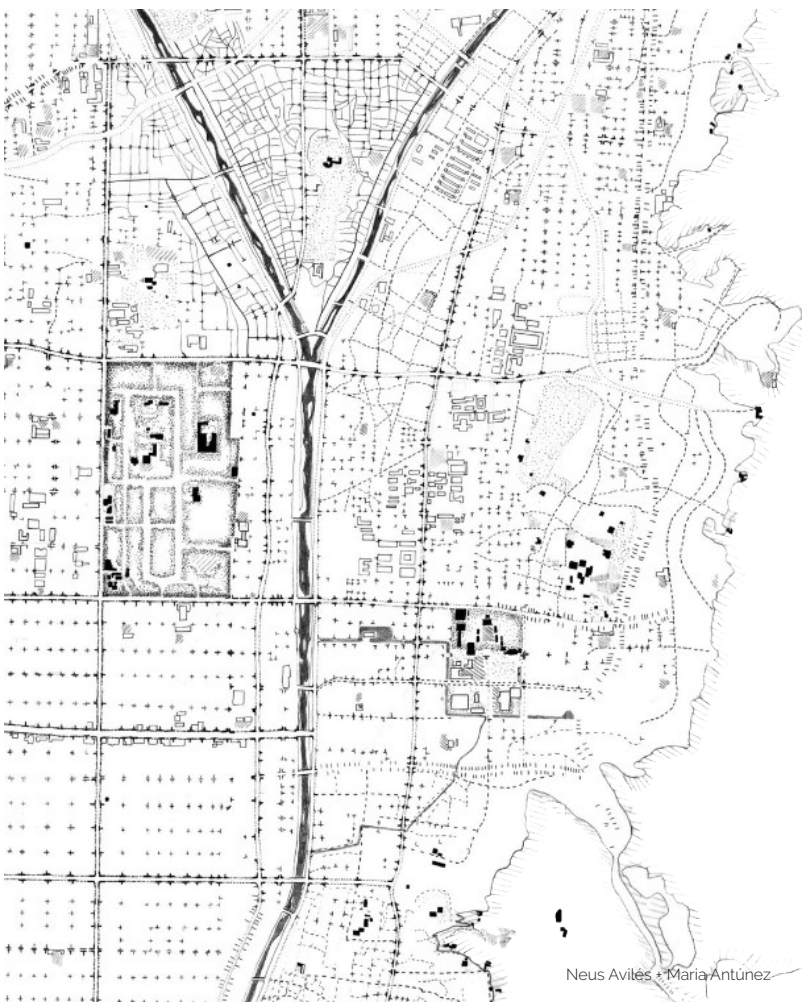
Eudald Guillamet + Pau Garcia + Albert Andreu

Emmanuel Durand + Jordi Acacio + Arnau Toscano + Toni Huget

Urban Design II
Urbanística II

Neus Avilés · Maria Antúnez

Mar Millaret · Quim Navarro · Ireneu Prat · Aida Tarradellas

The second year of Urbanism at ETSAB focuses on the study of the city and its parts. First, it looks at the physical form determined by geography, major infrastructure, singular fragments and the different fabrics that make it up, with attention to the history, demography, activities and flows that explain the immaterial phenomena that characterise the city. Second, it carries out an urban design analysis based on The forms of urban growth, a work by Manuel de Solà-Morales, the founder of the Barcelona Urbanism Laboratory, in which he discusses a theory he developed in the early 1970s according to which the way in which land division, urbanisation and buildings are linked over time gives rise to diverse urban fragments.

The lectures present several projects of city growth up to the 20th century and interventions of urban regeneration, densification and degrowth carried out during the 21st century. The lectures are presented in video format and are available for a week; every Thursday the topics of the lectures are discussed for 30 minutes in small groups. Students prepare a notebook composed of their notes on the lectures and debates and other materials collected during the semester on the topics that they hand in every week.

However, the course is fundamentally practical and involves two exercises that are carried out during the semester: the first, on the understanding and representation of different cities around the world; the second, on analysis and urban intervention in an urban fragment near Barcelona.

Lectures

1. Introduction to the course. Representation of the city.
2. The city by parts. Plots / Buildings / Urbanisation. Urban growth and shrinkage.
3. The regular city: extensions, grids and foundations.
4. Self-production of habitat.
5. The Garden City. Ebenezer Howard and the English experience.
6. The Garden City. The American second round.
7. Mass housing and the open city. Barcelona's industrial estates.
8. Mass housing and the open city. Hoffs, siedlungs and grands ensembles.
9. Utopias and ideal cities.

Exercise 1: Representation of a city

The map of a city is a conventional and codified representation, the synthetic expression of its materiality and the reflection of its dynamics, conflicts and longings. Each city is presented as a particular and unique scenario in which the following materials are combined in an autonomous and original way:

/ Geography. Orography, coastlines, ridges, hollows and plains give shape and physical support to the urban fact. It represents the biophysical matrix of urbanity, the city before the city.
/ The great infrastructure. Port, airport, train, motorways, superimpose on the geography traces that characterise the main features of the shape of the city.
/ The basic urban structure. The main avenues and layouts stand out among the network of streets and households. Large buildings, open spaces and other symbolic pieces complete the ensemble of unique spaces in the city and support urban activities.
/ Parts of the city. Neighbourhoods and districts are grouped together and fit the material conglomerate of the city. Distinct pieces that draw a puzzle in which one can

distinguish the remains of the previous city and the current sediments. Each piece is characterised by the dimensions of the fabric, the density of inhabitants, the activities carried out and the connections with the rest of the parts.

Exercise 2: Scan Barcelona
The second exercise of the course deepens the analysis of the city by parts and initiates the urban intervention. The analysis is approached from the knowledge and direct experience of the site; the intervention from the speculation and abstraction of the concrete case study.

SENSITIVE APPROACH ON SITE: The exercise begins with a field visit that should trigger observation of the site. Looking, listening and asking questions will give you tools that will refine your look at urban form and composition.

URBAN FABRICS: The exercise consists on analysing four fragments of 5 ha (approximately) of a fragment of the metropolis, corresponding to four different types of urban fabric and including at least one fragment of low-density city (garden or self-produced) and one fragment of open city.

The first part of the practice of this part consists of understanding the layouts by analysing, drawing and measuring them; the second consists of intervening in one of the fragments by varying the rules of composition of the urban form.

Assessment:
In order to pass the subject in the continuous assessment it is necessary to have handed in all exercises and notes in relation to the lectures and discussions. 30% Exercise 1 + 60% Exercise 2 (15% part I, 30% part II, 15% part III) + 10% notebook A5 theoretical lessons.

Faculty:
Eulàlia Gómez-Escoda, course coordinator.
Eduardo Cadaval, English group.
Laia Alemany, Joan Martí, Daniel Navas. Catalan and Spanish groups (all faculty members can speak English fluently).
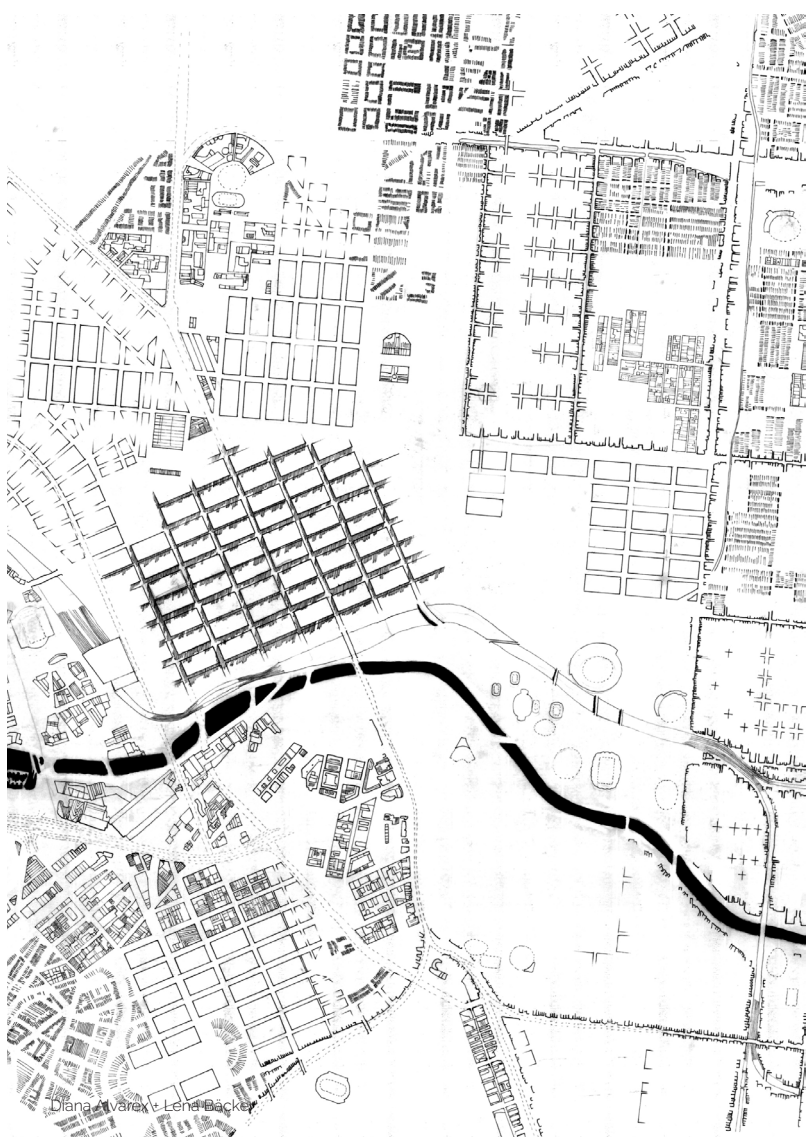
Diana Alvarex - Lena Backer

Laia Camats - Emma Cano

Pablo Rodríguez + Arnau Riu

Urbanística 4 focuses on the management of urban residential projects that transform the city. It focuses on the role of the residential project in urban renewal; on the definition of urban fragments, with a mainly residential destination, understood as groups with the capacity to form identifiable urban spaces and architectural planning sequences. This is done through the combination of the component elements of the urban form, streets and open spaces, plots and buildings according to logic mechanisms and instruments of composition typical of this type of intervention, defining the rules that guide the layout of streets, the categories of public spaces, the organization of the site and the arrangement of buildings.

The course proposes to work with the most common urban design systems, either indistinctly or in combination: designs that mostly follows the alignment of the road (islands) and designs according to specific volume (open block). In the first group, we find a direct relationship between buildings and roads, where the construction tends to be arranged along the streets, configuring islands built with buildings of similar characteristics. In the second group, buildings are arranged relatively independently to the road layout, and enclose logics based on repetitions and combinations of volumes. These are differentiated morphological options, which can also be used simultaneously.

Objectives:

This course has a triple pedagogical objective: to provide students with a set of instruments, to establish a methodology and to acquire cultural references.

Instruments. To facilitate the learning and application of working tools to adequately relate the materials proper of the residential project (diversity of building typologies; streets and open spaces; the domains; complementary activities, such as shops and small facilities...), we will distinguish between composition instruments and project logic. The former will grow in complexity, from alignments, symmetries, repetitions and regulating strokes, to rhythm, variation, serialization, contraposition, gradients or the use of complex patterns.

Method. The method is based on a gradual iteration of phases and themes; on feedback processes between them; on frequent changes of scale; on different working spaces and collective debate; on the construction of an individual intellectual path; on the continuous combination of analysis (of the area of intervention, of paradigmatic examples ,of specific aspects of the residential complexes) and propositional assaults of deepening in certain aspects of the project; on the use of references. A process that is more helical than linear, more strategic than pre-staged, more temporary and incremental, rather than in phases that are limited and excluding.

Cultural references. It triggers the knowledge of some examples of reference and key pieces of the urban culture of the twentieth century, with an intentional look, as is that of its contemporary design utility from its paradigmatic character. The selection, limited, intends to show those projects and designers that explore innovative mechanisms of arrangement and composition, useful for the development of the exercise.

Exercise 1: Measuring some residential projects

The specific objective is that the student learns the meaning of some concepts and parameters whether they are indicators or descriptors such as density and gross and net F.A.R; occupancy, and is able to apply them in the evaluation

of projects, but also in the programmatic definition of the exercise. These indexes are quantitative and programmatic references that allow us to parameterize, homogenize and compare morphologically diverse proposals.

The expected result is the creation of summary tables of the data from the reference examples.

Exercise 2: Designing a residential fragment

The main exercise of the course will be developed in the upper part of the Plaça Comín (85,220 m2), in the Penitents neighbourhood of Barcelona, located at the foot of the Collserola park under the central part of the mountain range of the same name. Originally, the Coll dels Penitents joined the Collserola peak and the Coll peak. Penitents area mainly occupied the south-west side while the north side was part of the Teixonera neighbourhood, more linked to Horta.

The hill has always been a neuralgic point of communication between the towns of Gràcia and Horta. At the Coll dels Penitents, the roads connected these two villages with the beginning of the Arrabassada road that crossed Collserola through the Coll de la Font del Rabassadet.

Currently, the neighbourhood occupies one of the two sides of the initial stretch of the Vallcarca stream. The valley arises from the course of two streams, that of Collserola and that of the Penitents, which join under the road to end up forming the Vallcarca stream.

The orography of this valley has historically separated the neighbourhoods that have been formed on both sides. This effect, very marked in the lower parts of the valley, has been accentuated in the upper parts by the strong accidentality of the land. Thus, in the lower parts it has caused the separation between the neighbourhoods of Vallcarca and Putxet and, in the upper part, between the built-up areas of Carrer Collserola and Carrer Maduixer and Carrer Ticià and Vall-Parc.

Another fundamental element to understand in the fracture between the built-up areas of the upper part of the valley is the presence of the urban development effects linked to the opening of the central tunnel of Collserola (or Tibidabo tunnel) foreseen in all the urban development plans of Barcelona since 1959.

Parameters:
Area 85,220 m2.
Gross F.A.R: 1.5.
Net F.A.R: 1.75 / 2.5/ 3.0 m2 depending on the location.
Residential use 80% of the buildable area.
Tertiary/commercial use 20% of the F.A.R.
Systems 50% (35% green spaces, roads are necessary).
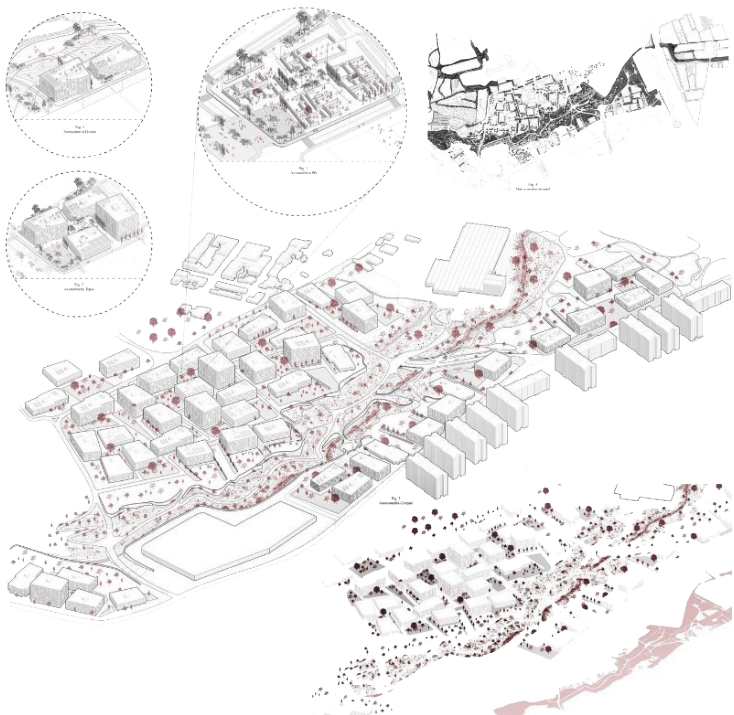Facilities 10%.

Faculty:

Stefano Cortellaro, course coordinator.
Adriá Guardiet, English group.
Marta Bayona, Sara Mas, Francesc Baqué, Albert Valero. Catalan and Spanish groups (all faculty members can speak English fluently).

Sergio García + Trich Adajar

Javier Arés + Simó Sabater

Urban Design VI
Urbanística VI

Laia Oriol + Marina Lillo

Sara López + Marina Ojeda + Júlia Rami

Intermediate cities

One of the responses of cities to contemporary environmental, social and economic urgencies is to rethink their relationship with the territory in which they are located. It is of the utmost importance to reconnect with the geographical support and its ecosystemic dynamics. It is necessary to establish new synergies between the city and its surroundings.

These challenges are latent throughout the territory, but they are especially so in those places that have historically functioned as capitals of a given territorial or landscape unit. In Catalonia, most of these capitals are today intermediate cities, i.e., between 20,000 and 120,000 inhabitants, a dimension that not only allows an agile understanding of the whole, but also makes them especially attractive because of their relationship with the rural environment.

Intermediate cities are currently home to 40% of the population of Catalonia, and are cities that act as interchange spaces for other small nearby nuclei, establishing complex network relationships of centralities distributed throughout the territory. The population of rural or dispersed urbanization nuclei usually find in these cities the opportunity to access basic facilities (such as schools, hospitals, administration, markets) and also services (jobs, technology, transport). This type of city has often been the first step in the transition from the rural to the urban world.

The city as a project

In these cities of intermediate size, it is also natural to discuss urban planning in terms of their general form. Architects are often called upon to define the short- and medium-term horizons of these cities, whether through the development of urban architecture and projects or through the drafting of urban plans in dialogue with the different layers of planning that determine each space of the territory.

In these cases, it is necessary to develop a singular design look, which addresses the different scales simultaneously and where concepts such as city model, urban strategies, processes, agents, infrastructures or definition of new programs come into play. Unlike other more guided professional experiences, here we are asked to explore the city as a whole in order to discover new strategies not very evident and to define the bases for their execution.

Challenges to intermediate cities.

In the project on medium-sized cities we can highlight up to 5 contemporary challenges:

(1) Perspectives of urban growth often at odds with the natural values of the territory and, in many cases, disproportionate to the demographic trend and needs of real or planned access to the housing area.

(2) An urban and interurban mobility almost exclusively based on the automobile -private vehicle- and combined with a low efficiency of public transport. Even so, they are cities with a dimension that should invite to walk and to leave them also in an active way.

(3) Peri-urban agricultural production that often combines small recreational farms -often informal- with heavily industrialized units and, consequently, with a progressive reduction of ecological diversity.

(4) Proliferation of large logistic or industrial platforms located in areas of high accessibility but, often, without taking into account the small rural villages or the effects on the pre-existing structures.

(5) Key infrastructures -rivers, streams- in increasing valorisation but, nevertheless, with greater social, recreational, landscape requirements and also as ecosystemic services to respond to the effects of climate change.

Exercise 1: Exploration of the territory

Getting to know a territory is the action that must precede any project. To do so, it is necessary to approach it with a double attitude: with a desire to be surprised by the reality itself and, at the same time, with an intentional look, that is to say, with previous intuitions. As architects interested in the improvement of the environments, it is advisable that the urban analysis is not aseptic, that is to say, it must be directed to critical action. What is there in this space that could be or work better?

In pairs, select 1 theme and build 1 interpretive map (drawings, diagrams, press clippings, photographs, etc.) to help answer the question.

1. Igualada before and after
2. Igualada in topography
3. Green ring of Igualada
4. Igualada, radial and parallel
5. Igualada on foot
6. Active Igualada
7. Igualada for living
8. Igualada today
9. Igualada-centres
10. Productive Igualada
11. Future Igualada

Exercise 2: Strategy

Remember the question of the course. How to approach the city as an open territory that surrounds it? How to give quality to the urban area of Igualada? What uses, strategies and actions could give meaning to this space?

Once the polyhedric vision of Igualada and its relationship with the Òdena region and the surrounding green belt have been built, it is the moment to point out points in this area where things could be different, it is the moment to start designs. To package proposals means to assume that they are not finished; that they are seen and understood, that they are clearly drawn, but they are not complete and we have not gone into the details.

To do this we will approach the drafting of a master/strategic plan for Igualada and its surroundings. This project has to build a new image or urban model, introducing a single narrative line that responds to a theme or themes.

Exercise 3: Urban Project

Urbanism must not only address the discussion on the large scale of the city and the territory but must also be able to offer a detailed definition of the character of each space. It is necessary, therefore, to approach to validate the general hypotheses and to raise specific proposals. This is the moment to put into practice the urban project tools that you have worked on in previous courses as a 'test' to assess the validity and strength of the general intentions of the previous exercise.

1. Design. Criteria for the arrangement and placement of uses.
2. Agents. Who are the agents involved in the project?
3. Phases. In which phases will the project be developed?
4. Planning. What does the planning say and how is it modified because of the project?
5. Territory. How will the territorial scale improve as a result of the project?

Faculty:

Àlvaro Clua and Alex Giménez, course coordinators.
Alex Giménez, English group.
Sebastià Jornet, Robert De Paauw, Manuel Ruisánchez, Jordi Franquesa. Catalan and Spanish groups (all faculty members can speak English fluently).
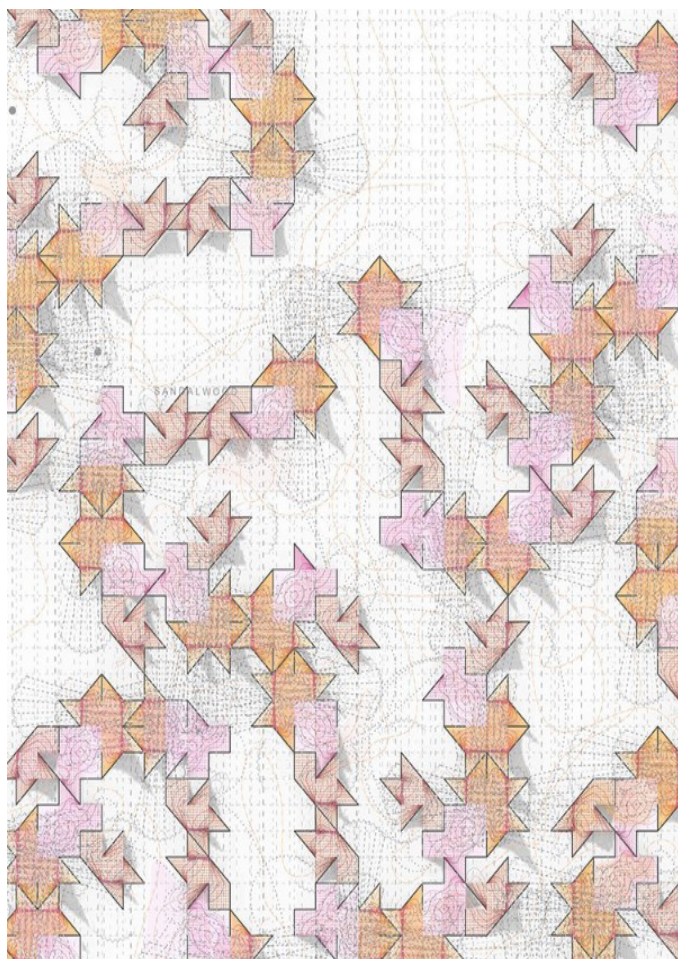
Carmen Alberti + Helena Bonet

Marta Raso + Gemma Ruiz

Digital Fabrication Systems Seminar
Seminari Sistemes Digitals de Fabricació

Digital Fabrication System Seminar + LAC II Students

The seminar works as a subject to support and expand the knowledge that will be necessary to develop the **LAC II Thematic Design Studio**

It will provide the tools and knowledge that will accompany the student in the process of developing the proposals focused on 3 sections:

Graphic documentation of the presentations.
The principle of progression of improving skills and knowledge is taken. Consequently, the skills of drawing by hand, making collages to develop and transform ideas, from the abstract world to the concrete world of architecture, will be strengthened.

Project sustainability and "triple balance".
Faced with the current climate emergency, concepts of sustainability and energy efficiency will be explained and taken into account in the projects, both in the appropriate solution and their correct quantification.

Computational design of the project.
The ideas will be worked on with the computer tools to evolve complex geometries such as parametric, fractal or defragmented systems. The next step will be to develop these proposals with computer systems, using them in the most appropriate way to find solutions to ideas raised.

The students will work individually and in teams of 3-4 members according to the groups formalized in the workshop

Software:
Rhinoceros 3D v.7 + Grasshopper.

Assessment:
Regarding the submissions scheduled in the LAC workshop, supplements will be requested that will be evaluated by the seminar, according to the following components:

Graphic documentation of the presentation: 40%
Sustainability of the project and "triple balance": 30%
Computational Design of the project: 30%

Faculty:
Lluís Giménez-Mateu, Salvador Gilabert.

Mallorca Collage
Mallorca Collage

How has Mallorca been seen; how does it live and how will it live?

The objective of Mallorca Collage is to construct a contemporary reflection of the different realities that take place on the island as a field of controversy, from its most local to its most globalised dimensions. To this end, the students will project an archipelago of possible Mallorcas from an architectural perspective that combines past, present and future ways of inhabiting the island. During an intensive week, the elective is based on the experience of travel and on-site work in Mallorca.

Through fieldwork routes and encounters, students will record and catalogue architectural elements, common to areas such as landscape, construction and habitation. From the collage use of this information, possible islands will be projected, places in themselves, synthesis of the elements found in the present and those proposed for the future. The multiple, intense and precise drawing will be the binding means of the process and project proposal.

In the project for Esquivel, Alejandro de la Sota relied on the power of memory to "achieve the atmosphere and the possible grace", to draw from the memory the details of doors, ironworks, chimneys, etc. Project material that formed a numbered collection, fruit of fragments of travels, stays, and experiences not registered "without photos or notes" for Andalusia.

In the case that concerns this elective, given the intensity condensed in a week, the recording in aid of memory will be part of our direct experience. The square photograph, the selected video, the raw sound or the synthetic drawing will be the minimum formats necessary to record everything that could be useful as project material. The collected information will be post-produced, catalogued and hierarchized, in order to distil some ingredients to work with and articulate architectural strategies.

By means of the specific visit of different sites, it is intended that the student investigates, catalogues and ends up articulating in a unique drawing, a series of common denominators, synthesis of contrasted aspects of the island. This architectural drawing/plate collage will be a vehicle of communication and project of those present realities and of the possible ones contributed by the student.

The objective is to generate a reflection through the development of a utopian project resulting from a specific place: to look, condense, distil and synthesize the experience of the village through the project as a means of communication of a present reality and a speculative way of other possible realities.

The village, with its contrasting controversies and encounters, is the excuse, as a controlled territory with clear geographical limits, for the student to take a look that can be applied to any other place. The project of each student will not be a solitary island, fruit of his personal reflection, but a place influenced by the relationship with his companions, with the different agents and cultural landscapes explored, a fragment of an idea of a possible Mallorca, conscious of its realism and romanticism.

The main theme of the elective is the detection of controversies. The situations of contrast and encounter present on the island will be the places where the focus will be on the development of the research, the field work and the project. The cases to be observed will be composed around these three structural architectural axes:

- Everyday life: The customs, the use and the way of living of the space from the urban to the domestic.

- Construction: Geometry, dimensions, colour and texture of architectural elements.

- Landscape: Territory, geography, nature, objective environmental conditions and subjective atmospheres. These elements, agglutinating the different points of view, will be created by historical themes of the island such as tourism, mobility, sports, leisure, immigration or gastronomy.

The visits and routes organised for the realization of the field work will be linked to these themes and will be specified annually according to the opportunities for collaboration that arise with institutions and agents of the island, as well as the contemporary concerns of each moment. Places such as the city of Palma, the Utzon house or the Serra de Tramuntana mountain range will be obligatory visits.

During the development of the project using the collage technique, graphic and methodological references will be dealt with, in order to elaborate the architectural drawing resulting from the work and the experience.

Activities:
The tasks to be developed by the students will be divided into three blocks:
- Preparation of the trip in classes to participate virtually or in person.
- Field work, recording and post-production.
- Development of the project in workshop and final public communication.

Faculty:
Pablo Villalonga.

Material, System, Prototype
Material, Sistema, Prototip

Material, System, Prototype Students

The main purpose of this course is to learn to design taking into account the material we undertake. To understand the intrinsic properties of the material under study in order to apply them in the most optimal way to a given construction, structural or manufacturing system.

In this edition we will focus on the construction with ceramic material. We will make a first reading of the traditional techniques undertaken historically and in the present day. We will incorporate the study of new technologies related to digital tools such as 3D printing and structural design and analysis with parametric tools.

The objective is to dissociate the traditional use of known materials to adapt them to new requirements and/or design and manufacturing technologies of the future.

Structure:
1. Introduction. Solid construction:
- Traditional spatial systems associated with solid architecture: Masonry and stereotomy.
- Material innovation and formal innovation. New digital tools in an environmentally and economically sustainable architecture.

2. Designing solid architecture.
- Introduction to graphic statics and structural design.

3. Introduction to parametric design tools and formal optimization:
- Introduction to new parametric design and formal optimization software (RhinoVAULT2 + COMPAS).

4. Techniques associated with soil construction (raw, stabilized or baked).

5. Development and construction of a small pavilion: practice in parametric design + practice in project construction.

Activities:
Every two weeks there will be an exercise that may be solved during class time that will help to achieve the contents of the subject. These exercises will represent 50% of the continuous assessment.

The objectives of these practices are that the students:
1. Reflect on their own practice or approach to the architectural project.
2. Understand how and why mass architecture has traditionally been built.
3. Understand and incorporate the new digital tools in the project.

Faculty:
David López, Marta Domènech, Marc Serra.

Territory and Landscape
Territori i Paisatge

Carmen Salas

Naiara Gálvez

The main objective of the course is the introduction to landscape architecture from a contemporary approach to the discipline. The contents to be developed have a theoretical and practical approach, based on the analysis of specialized bibliography and the study of a selection of the most representative landscape architecture projects according to the main themes developed at the different scales of the landscape.

Sessions with Marina Cervera will include a research seminar with class-level sharing to discuss landscape projects and concepts. Class attendance, active attitude, and classroom work are required to generate the minimum workload at home.

Sessions with Pepa Moran will consist on developing a landscape design (competition format) individually, complemented with theoretical classes presenting reference landscape projects from three main axes: topography, water and vegetation.

Exercise A: Essential Landscape Readers

Students will read and analyse an article to present the summary to their classmates. Presentation to classmates and delivery in .ppt format of at least three slides containing:
1. Title of the article and publication, author name and picture, year and media of publication.
2. Text structure and synthesis by parts.
3. Summarize basic concepts seen in the text.
4. Graphic sheet of visualization authors and concepts.
5. Indexes, white books, protocols, and methodologies to implement the concepts

Exercise B: Designing Landscapes

Theoretical pills on reference landscape designs from three main axes: topography, water and vegetation will be combined with practical sessions, based on:
1. Choice of place (every student can choose a specific landscape to work on, to which they feel attached to or recognizes the need of a specific landscape project).
2. Landscape analysis: landscape structure, values and dynamics.
3. Design proposal.
4. Final presentation and discussion in competition format.

Assessment:

The seminar module and the practical module will be evaluated by an exercise, each module, that will integrate 1/2 of the final grade, in which both the process and the tutorial discussions and the result will be assessed.

Seminar module consists of a classical theory pill proposed by the teacher and an inverted class where students discuss or present their work to classmates. Therefore, class attendance is mandatory.
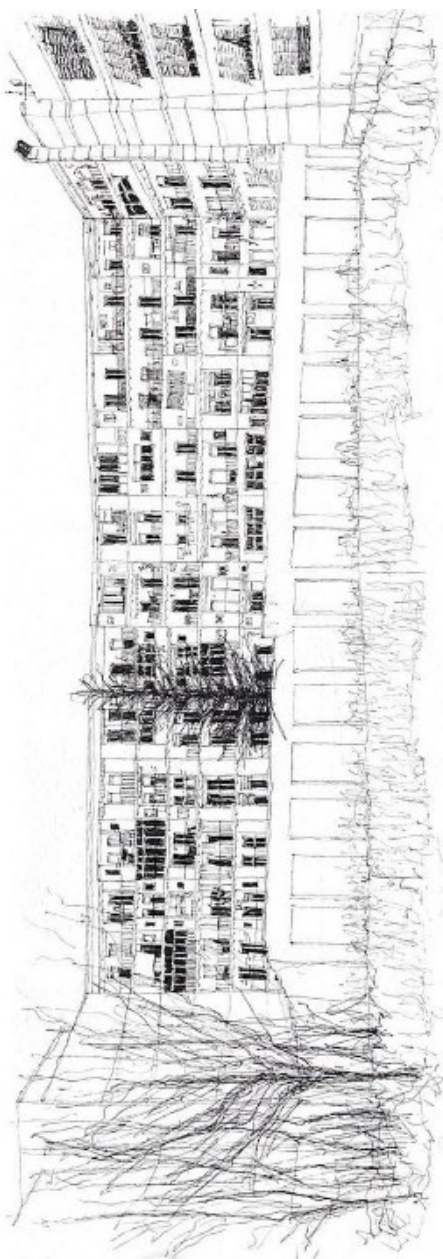
Practical module consists of a theoretical pill on landscape design references and students' presentations of the evolution of their own work, that will be discussed and shared with their classmates and professor. Therefore, class attendance is mandatory.
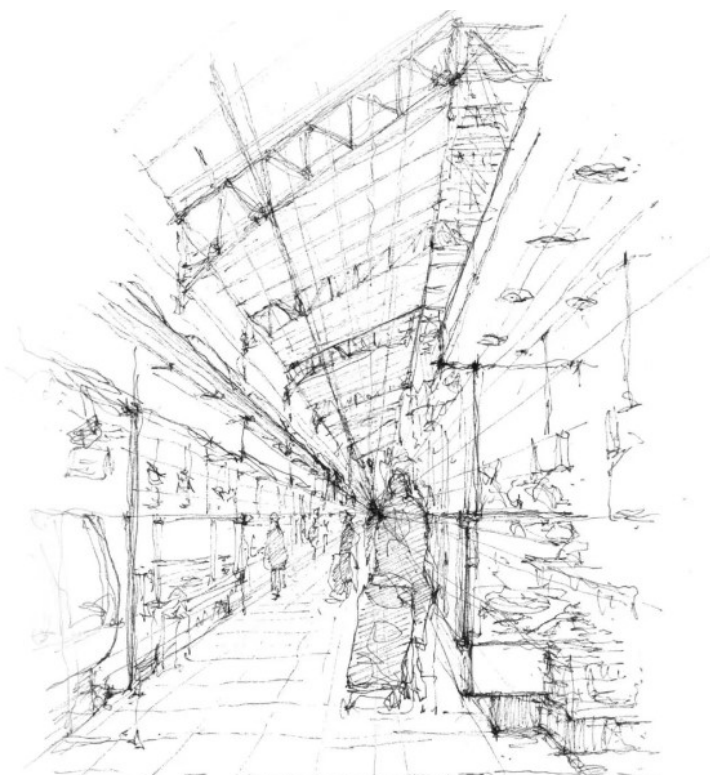
Faculty:

Marina Cervera, Pepa Moran.

Urban Notes
Apunts Urbans

Akgul Irem

David Piquer

Urban Notes is a fun community activity, in which architecture students and, in some cases, neighbourhood associations and groups, share a pleasant moment, exchange visions and ideas about the place, and thus bring the students closer to the local communities.

The teaching objective of the course is to present urban and architectural analysis methodologies through hand drawing (urban sketch) and other mixed techniques (hybrid drawing). Walks with associations, open urban drawing sessions and co-creation sessions provide a channel for dialogue between the participants to develop urban strategies.

Structure:
- Theoretical class (TC). An initial class with theoretical contributions on the following themes: participatory urbanism, emblematic figures and groups, drawing as a process and urban drawing.

- Walking tours with the neighbourhood association Eix Pere IV (WT). Students along with the association's participants were invited to take notes and draw freely. The route was around the Pere IV axis, from its most peripheral section (Provençals de Poblenou) to its most central (Parc and la Llacuna del Poblenou). The tour has revealed various contexts that will be worked on, with old industrial premises that still exist or have already collapsed and other symbolic spaces.

- Open Urban Sketching Session (OUSK): a total of six urban drawing sessions are prepared to draw places already seen on the routes: Can Ricart, La Escosesa, Passatge Trullas, Rambla del Poblenou, and two sessions to be chosen by the students. Each session is presented in an open way, with promotion on the OUSK website and on Sant Marti district social networks, to include other participants and gather external visions.

- UPC is reflected in the book Poblenou. Illustrated atlas of an industrial neighbourhood (2018). According to Lapin, the heritage and social fabric of Poblenou is undervalued. He explained that he began to draw the places of Poblenou to remind the neighbourhood he fell in love with, which he saw was quickly fading. He also gave advice on drawing, from an illustrative point of view, using curvilinear perspectives. As a starting point, open sessions allow meetings that enrich the experience and the data collection.

- Co-creation sessions (CO): three quick co-creation sessions are planned. The first was to define themes on which to work, and the last two are to work on collective delivery. These sessions should have taken place in a round table with "snowball" dynamics in which the participants, in this case students, first meet in small groups of three people and then form a larger group of six until they reach the total number of participants. Rather than reaching the idea of consensus, the exercise had to consist of creating a discourse and a relevant manifesto about the place under study.

- Final session (DS): The final session is to involve an exhibition at the ETSAB and in Ca L'Isidret, with round table sessions

Faculty:
Bruno Seve, Melisa Pesoa.

Walking Barcelona
Caminar Barcelona
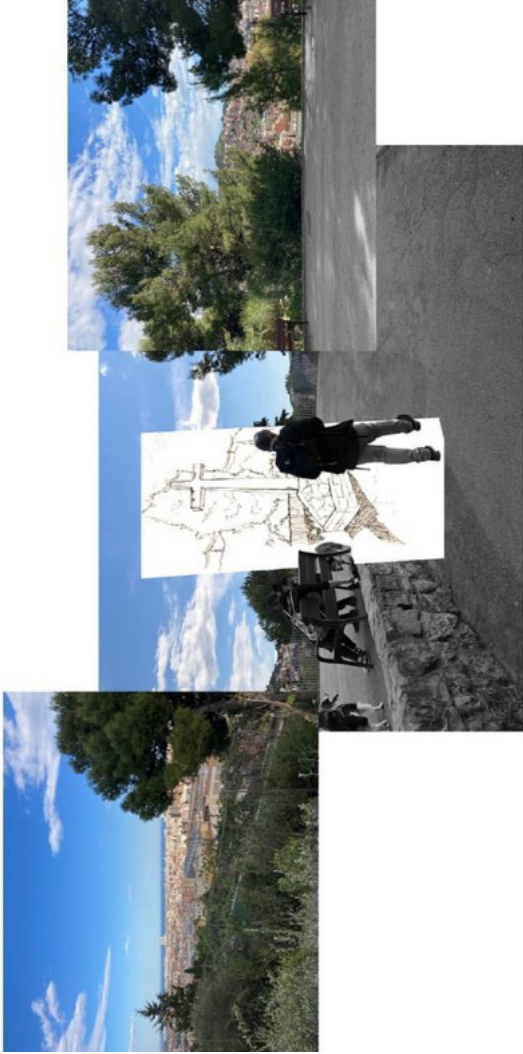
Carlos + Elisenda

Elisenda

Walking the neighbourhoods of Barcelona is a teaching experience that, beyond the physical limits of the classroom, aims to develop the perception of urban space and its transformation through guided tours through the metropolis. The aim is to bring us closer to the history, the social landscape and the construction of the urban heritage of the different neighbourhoods. An attitude close to the analytical look of the explorer or the "surveyor" that seeks to integrate documentary knowledge and direct experience of the places. Also, to the more personal approach of the drift of the passer-by, "flâneur" or "wanderer", to take advantage of the urbanism workshop that constitutes Barcelona, and to incorporate new images and urban experiences to the baggage of the architecture student. It is proposed a work of interpretation of the city from building a "Map" of each itinerary.

It is important to experience the tangible and perceptible reality of the city, not to forget the instrumental condition of the multiple analog or digital media at hand. A recurrent challenge of architecture and its learning.

Structure:
1. Presentation
2. Ciutat vella / Carrer Ferran and Plaça Real / Sta. Catarina market
3. Port vell / Barceloneta / Moll de la Fusta
4. Raval / MACBA and CCCB / Hospital / St. Antoni
5. Barcelona litoral / Vila Olímpica / Parc de les Dunes / Fòrum / Besós
6. Eixample central / Fort Pienc / Editorial GG
7. Districte 22@ / Glòries / La Escocesa
8. Seminar
9. Gràcia / Turó de la Rovira / Park Güell
10. Vall d'Hebron / St. Genís dels Agudells / Montbau
11. Rec Comtal / Montcada / Vallbona
12. Montjuïc / MNAC / Fundació Miró
13. Seminar

Faculty:
Álvaro Clúa, Jordi Franquesa, Pablo José Martín, Josep Parcerisa, Isidre Santacreu.

BARCELONA
School of
Architecture

ETSA**B**
UPC

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