Advanced Master in Computational Design and Making
This Advanced Master in Computational Design and Making represents a unique experience to explore the blurring boundaries between art, architecture and engineering.

Francesco Cingolani
Director of the Computational Design and Making Advanced Master.

Computational designer and co-founder of VOLUMES, a collaborative space in Paris including a coworking, a maker space and a foodlab. Francesco Cingolani teaches computational design and parametric architecture in different design and architecture schools and digital arts centres. He strives to push forward the idea of design as a process without boundaries, merging art, social sciences and collaborative cultures.

The aim of the Advanced Master is to provide students with a cross-disciplinary culture of computational design, from parametric conception to extensive knowledge of the impact of digital design and making tools on artistic professions, design, urban planning, architecture and engineering. The training has been designed as an augmented experience including courses, prototyping workshops, conferences, maker-spaces visits and networking events. The courses and conferences will take place in multiple locations in Paris, making this training a true opportunity to discover innovative places in the capital.

Our aims

Based on 3 thematic outlines, the program intends to achieve the following objectives:

• Develop a comprehensive digital knowledge and strong abilities in creative design of digital process in art, architecture and engineering.

• Gain knowledge, with the help of practical works, of different technologies used for digital making and robotics (CNC prototype and 3D printing, design, making of drones, industrial robotics).

• Mastering theory and architectural applications of complex geometries, genetic optimisation process and energetic calculations.

Program syllabus

The program is 12-month long based on an «Executive» Part-time format (one week per month).

### TEACHING PROGRAM - 350 hours

### THESIS and VIVA

#### Program

**Art, Design and digital knowledge (120h)**
- Digital City and « Glocal » dimension (Domenico Di Siena) (20h)
- Digital Culture and Space (Yasmine Abbas) (20h)
- Data materialization and mesh modelling (Andrea Graziano) (30h)
- Encoded bodies, embodied codes (Alessio Erioli) (30h)
- Video Art (Eric Vernhes) (20h)

**Digital fabrication and making (126h)**
- 3D Printing (Justin Dirrenberger) (20h)
- Industrial digital fabrication (Thibault Schwartz) (20h)
- Data matter / Drone design and fabrication (Aldo Sollazzo) (38h)
- Fab is Nature (Minh Man Nguyen) (48h)

**Structure, architecture and complex geometries (120h)**
- Performative Design (Sébastien Perrault) (30h)
- Management of complex geometries (Olivier Baverel) (30h)
- Conceptual design structure (Olivier Baverel) (30h)
- Optimization (Olivier Baverel) (30h)
Skills acquired

At the end of the training, the graduates will be able to:

• Understand the stakes of digital tools in the design process and its impact in the design collaborative culture,

• Design and develop non-standard digital making process for different machines (laser cutting, CNC, 3D printers...).

• Design visualisations, objects and architectures based on performance-driven complex geometries using several data and parameters (environmental, structural, uses, etc.)

Your career prospects

The skills acquired will enable participants to work in architecture and urban planning agencies, construction engineering design and consulting firms, graphic design agencies, art studios, construction firms specialized in complex geometries, fablabs, maker spaces, coworking spaces, software development companies.

Careers

Holders of this Advanced Master will be able to pursue the following careers, amongst others:

• Project Manager
• Senior Designer
• Executive Expert in Computational Design
• Fablab Director
• Parametric design consultant

Program STRENGTHS

- An innovative training, driven by the digital revolution in the field of the design and making of non-standards objects.
- The computational and procedural approach, applied to 3 fields: architecture/urban planning, art/design and making/robotics.
- A learning process conducted in English and based on an ongoing alternation between theory, design and prototyping.
- The integration of the students to an international network connected to Parisian creative hubs and the incitement for collaborative approach.

IN HER/HIS OWN WORDS

Franck Boutté Consultants Agency

We support the creation of this Advanced Master because the subjects it tackles open up outstanding new perspectives in our industry. It also brings an answer to the need for trained teams on the subject. With a profession widely depending on calculation software, computational design is a key point as it enables us to create our very own tools and approaches in collaboration with designers. The creation of a dedicated Advanced Master by renowned institutions such as The École des Ponts ParisTech, la Gaîté Lyrique and the Paris College of Art is truly thrilling!
Profiles and qualifications required
Candidates must hold a 4/5-year higher education diploma (Bac+5 or Bac+4) and have professional experience.

Admission
Candidates are eligible to enroll in the course after selection of their application by a jury (for more information, please visit: http://mastere-cdm.enpc.fr).
Candidates are admitted after an interview that measures the pertinence of the program with their own educational qualifications and professional plans.

Timetable
Applications: January to November.
Course begins: start of January.
Duration of course: from January to December (one week per month).

Places
20 to 40

Languages
The program will be entirely taught in English

Validation
366 h of lectures – Thesis
75 ECTS* (30 ECTS for the thesis, 45 ECTS for the modules) * European Credit Transfer System

Partners
The Advanced Master is supported by La Gaîté Lyrique, HDA: Hugh Dutton Associés, Paris College of Art, Volumes, and WoMa.

Scientific and Educational Committee
Head of the committee:
Philippe Morel (ENSA Paris-Malaquais & EZCT Architecture & Design Research)
Members (non-exhaustive list):
• Mario Carpo (UCL Bartlett & Ensa Paris-Malaquais)
• Kas Oosterhuis (TU Delft)
• Theodore Spyropoulos (AA Drl)
• David Gerber (USC)
• Jean-Daniel Kuhn (Systra)
• Eric Piccuezzu (Dassault Systèmes ; System3DEXperience Labs Director - Construction)

Teaching venues
The program will be taught at the following venues:
École des Ponts ParisTech
Cité Descartes – Champs-sur-Marne
6 et 8 avenue Blaise-Pascal
77 455 Marne-la-Vallée

Other venues in Paris:
La Gaîté Lyrique, Paris College of Art, VOLUMES coworking, WoMa.

Cost
€14,000 for students who pay for the course themselves.
€17,000 for students for whom the course is financed by a company or organisation.
These prices may change.

Contact
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