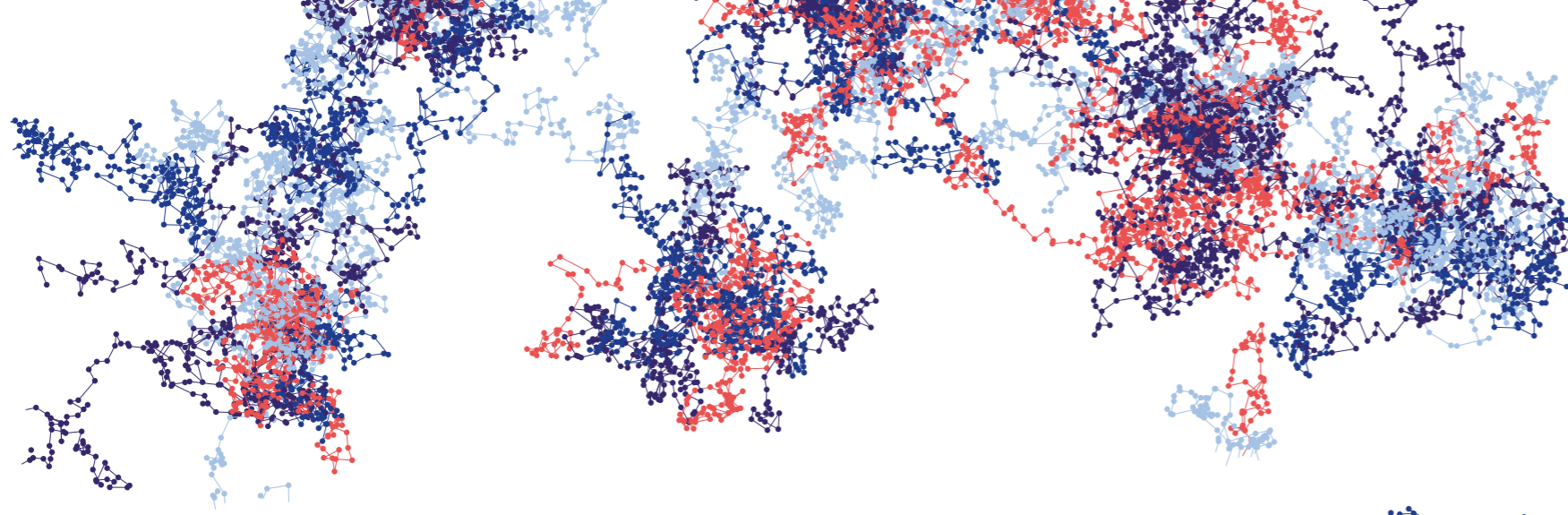


# Basque **BioDesign** Center

Materioteka & Consultoría



Postgraduate degree at  
the intersection of textiles,  
biology and digital fabrication

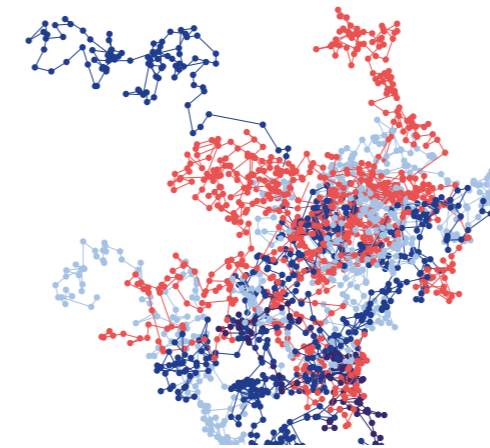


**Fabricademy: Textile & Technology Academy is a transdisciplinary course that focuses on the development of new technologies applied in the textile industry, in its broad range of applications, from the fashion industry all the way to the upcoming wearable market.**

The 6-month program runs in selected laboratories across the world and it is structured in two phases:

- » 3-month intensive learning: 13 weekly online classes by global experts and weekly local trainings and assignments guided by the local instructors.
- » 3-month final project development, mentored by local instructors and advised by global experts.

During the whole program, students have full access and guidance to an equipped laboratory. Selected works from Fabricademy students will be showcased at international exhibitions around the world.



**Participants at the Fabricademy learn:**

- » Research and Design methodology
- » Sustainability in Fashion and Textile field
- » Open source approach, contribution and dissemination
- » Digital Design in 2D and 3D
- » Digital Fabrication techniques, processes, machines
- » BioFabrication of materials, natural pigments and dyes
- » 3D modeling CAD and CAM software
- » Programming and electronics for wearables and e-textiles techniques

**How it works**

Each lab that participates in the Fabricademy program is a part of the global Fabricademy network (labs are often referred to as "Fabricademy Nodes"). The local branches of the Fabricademy program work with other participating Labs and experts from around the world via a distributed educational model where knowledge exchange provides a unique educational experience. We view and participate in global lectures on Tuesdays from 9:00 AM – 12:00 PM (ET) (3PM to 6PM CET). The lectures are recorded and available to participants throughout the semester. In addition to the lectures, there are a minimum of two lab days each week where participants have access to digital fabrication equipment and personal help with projects. Fabricademy faculties, who are experts in their respective fields provide global video lectures, supervise academic content, and guide research. Hands-on instruction at the labs is provided by local instructors who supervise and evaluate, develop and disseminate instructional material, and assist with projects.



## State-of-the-art laboratories and facilities

Basque Biodesign Center offers the possibility to carry out experimental research thanks to the BDC facilities, a space of inspiration where to rethink and rethink the realities of today, offering the structure and connections for the visions of new products to materialise, test, develop and have an active impact on people's lives. We develop a new approach on how to create, produce and distribute textile and fashion elements, through materials.

BDC is a convergence space whose mission is to drive the digital transformation of the materials of the future through experimentation, innovation and cooperation by creating technology-based solutions. Our vision is to be an inspiring place to create, the only one of its kind in Spain, which aims to unite the talent of our territory with that of the rest of the world and to reduce the distance between design and science. Design must be placed at the centre of circular economy strategies, and not just be a part of them; it is a key element in the construction of a regenerative economy. We are not only in a context of climate emergency, but of productive emergency.

We must rethink the processes from the beginning, from the design. It is an investment that generates competitive advantage and helps to build sustainable business models. BDC is a centre where design professionals, creators and professionals will be trained and advised to produce their own prototypes. We support the processes of creation and production, from the orientation to the innovation of the different artistic expressions, the detection and support to talent, the participative management and the relationship with the local environment.

BDC is born with the ambition to propose a learning place to encourage and nest new practices based on the development and prototyping of new materials and designs made from agricultural/livestock/food waste. We collaborate with local agents to promote a local ecosystem of circular economy, claiming the need to imagine new interactions for cultural/creative development.

## Lines of research

The course content is structured in 3 areas of research:

### Sustainability

- » With the United Nations Sustainable Development Goals (SDGs) at the core, we apply our experience and know-how to drive a regenerative transformation to the design industry.

### Biofabrication






- » We seek to apply the principles of biotechnology and biofabrication, working with living organisms such as bacterial cellulose, mycelium and micro-algae, to co-design and grow our designs and materials.

### Digital Fabrication

- » Through computational analysis and design, we mimic the patterns and behaviours of nature, to arrive at state-of-the-art machine-assisted digital fabrication solutions and processes.

## BDC AXES

**We are committed to the creative research that combines science, design, art... so that the creators of tomorrow contribute to more responsible world for the planet.** We advocate creativity, as a guide to new solutions from a perspective that someone technical would not reach, and from culture to generate narratives that reach more layers of the population.

<p><b>Bio_lab</b></p> <p>Two laboratories for the materials development with living organisms, such as bacteria, fungi and algae...</p>	<p><b>Digital_lab</b></p> <p>Digital manufacturing laboratory that includes: 3D printing, laser</p>	<p><b>Textile_lab</b></p> <p>Textile manufacturing laboratory that includes: digital looms, sewing machines, textile printing...</p>
		
<p><b>Upcycling_lab</b></p> <p>Laboratory or space dedicated to the upcycling of multiple materials, with heat plates, mixers...</p>	<p><b>Art_lab</b></p> <p>Art laboratory with screen printing and paper printing workshop</p>	<p><b>Materioteka</b></p> <p>Exhibition guide to innovative and sustainable design materials.</p>
		

### TOUR VIRTUAL:

<https://www.youtube.com/watch?v=MG-uqgGVtm0>



## Year Schedule

- » Application & Enrollment: January to September
- » Classes: end of September to mid of December
- » Personal Project development: mid January to end of March
- » Local Evaluation: end of January
- » Final Presentation: end of March
- » Global Evaluation: April & June
- » Graduation: July / August

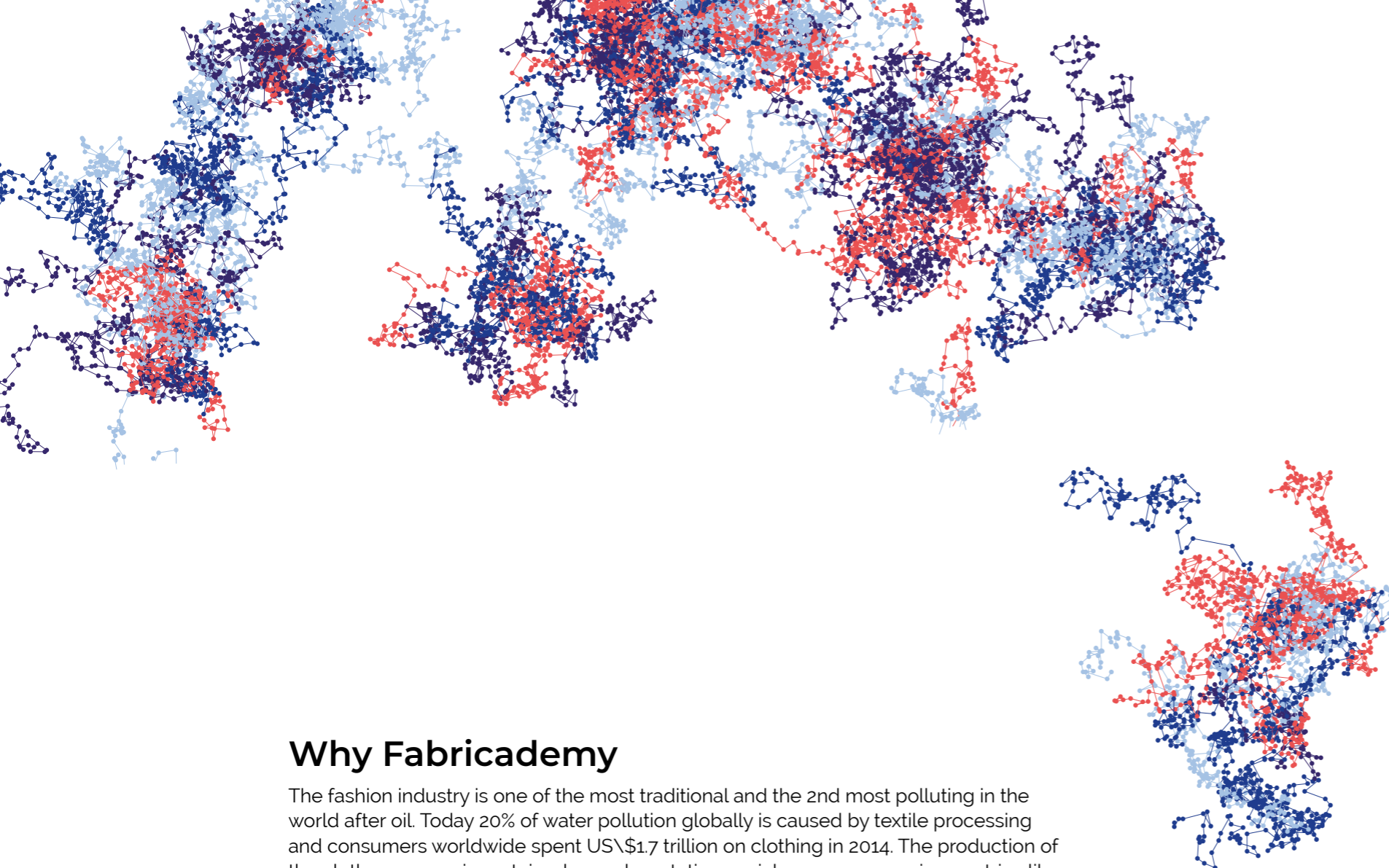
## Evaluations & Graduation

Participants' Final Project Presentations will be at the end of March 2021. Labs and students around the world meet to present their final projects to the Coordination team, instructors, mentors and experts invited as jury members.

A mandatory step towards graduating, participants will be evaluated in 2 steps: 1. Locally, by their Instructor (typically, from mid January to end February). 2. Globally by the Global Evaluation Committee (typically, the first two weeks of May). After this, the "May evaluation round" results will be announced around mid May. If the participant passes the examination and accomplishes all certificates, he/she will graduate for Fabricademy and therefore receive a free entrance ticket to the annual Fab Conference. The graduation ceremony will take place during July or August, during the International Conference of the Fab Lab Network.

## General Guidelines

- » Each laboratory informs the participants about the use of the building, safety measures, and use and booking policy of the machines.
- » Visas are only offered locally in selected labs and fabricademy global coordination cannot issue visas
- » Attendance to classes and reviews is mandatory. The participants are expected to be present at all classes and extracurricular activities, with a minimum attendance of 80% of every course's scheduled time. Failure to do so without a proper justification to the Fabricademy Instructors will affect the participant's evaluation and final graduation. The participants are expected to be on time to all classes, according to the online calendar provided by the Academic Coordinator. Extra classes that may be necessary to compensate or substitute regular ones, as well as special workshops, may eventually take place during mornings or weekends. Considering their full-time status, participants are expected to be present at all special classes.



## Why Fabricademy

The fashion industry is one of the most traditional and the 2nd most polluting in the world after oil. Today 20% of water pollution globally is caused by textile processing and consumers worldwide spent US\ \$1.7 trillion on clothing in 2014. The production of the clothes we use is sustained over devastating social consequences in countries like Bangladesh and China, where labour exploitation holds the low prices we love to pay in H&M, Zara and other fast fashion brands.

The textile and clothing industry needs to explore and start to implement more viable, sustainable and fair alternatives systems of today. The program will focus on the unethical and environmentally unfriendly realities of the current industry, while combining the knowledge of traditional and future craftsmanship to work towards new ways of designing, prototyping and producing for the slowly changing textile and fashion-industry.

Thirty years after the introduction of the World Wide Web and while humanity is transitioning from the information age towards the experience age, technology shapes the way in which we engage with our surroundings and becomes increasingly intimate. At the same time, the accelerated technological advances demand new skills and ethos to bring solutions to personal, societal, and industrial evolving needs. Technology is becoming an extension of our bodies, amplifying our senses while monitoring and controlling our environment, yet our continued impact on the planet requires circular approaches and environmental consciousness. In transient eras of post-human evolution, there is an impetus of reflecting on human's profound influence over other species and assuming the ecological and environmental responsibility of the anthropocene. Self-empowerment within collaborative spaces and networked communities is key to our evolution.

## About Fabricademy

Fabricademy was established in 2016 as a collaboration between people of the fab lab network that share common agendas, wish to expand peer-to-peer educational networks and believe that the current scene of the textile & fashion industry requires hybrid multidisciplinary profiles with digital competencies. The program explores the interrelation of human-technology-environment through the notions of embodiment, materiality, ecodesign, biodesign, performance, smart textiles and digital fabrication. Fabricademy is a transdisciplinary program with a mission to (re)shape and (re)define the implications and applications of technology in the textile and clothing industry, from the fashion sector to the upcoming wearable market. It offers a broad overview of the state of the art of the current industry and builds on "learning by doing" methodologies, tackling themes like personal fabrication, distributed manufacturing, industry 4.0, wearable technology, biofabrication, assistive technologies and sustainability.

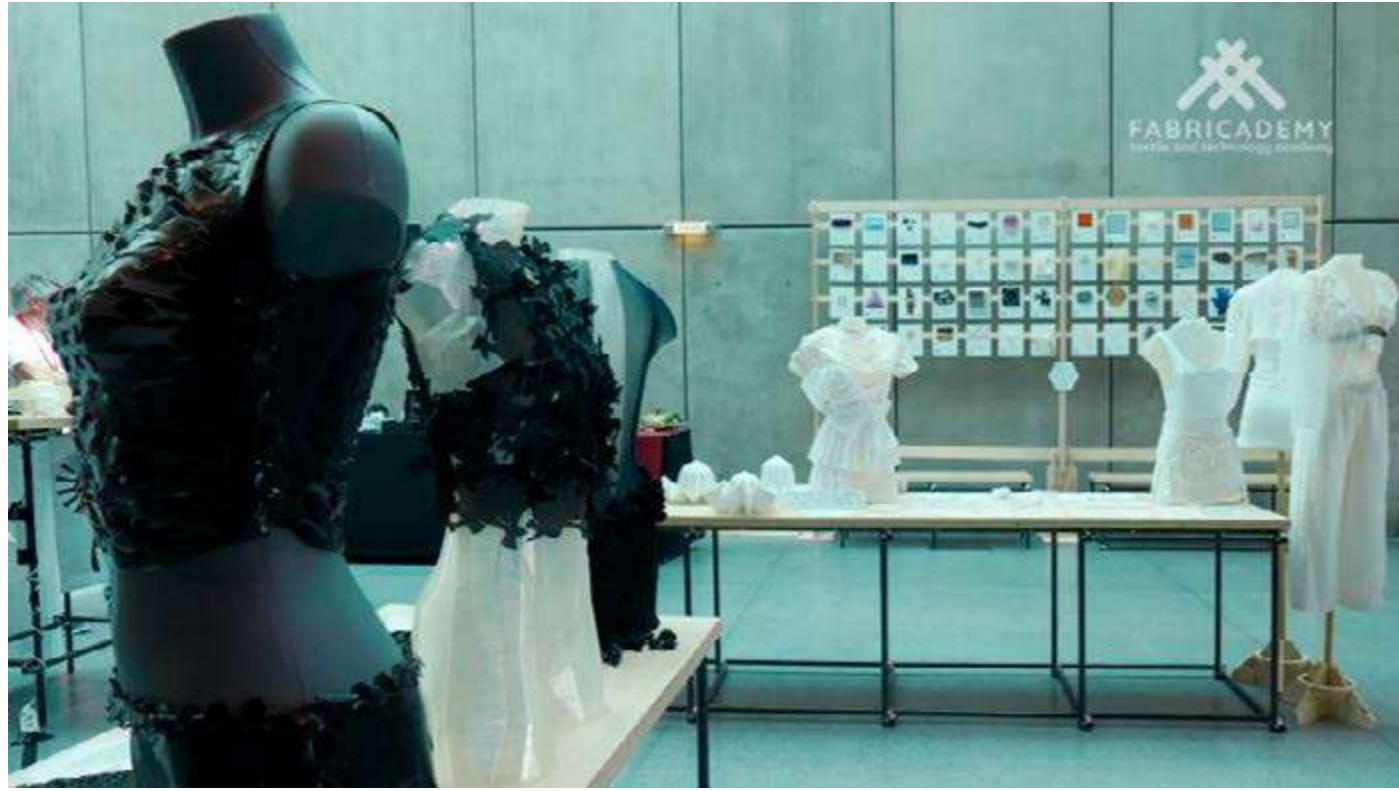
The program is structured as a two phase distributed blended learning approach, evolving over a 6-months period. In the first phase of the program, participants are introduced to prominent technologies through a series of hands-on intensive masterclasses. The classes interweave traditional craftsmanship with advanced prototyping tools, innovative, materials, software and manufacturing techniques. In the second phase, participants focus on the development of personal in-depth applied research, implement critical thinking and complementary skills for the development of innovative solutions that explore and propose more sustainable, fair and viable alternative systems to the ones today.

Through its experimental, practice-based, and creative approach, Fabricademy is open to a wide-range of participants, coming from various ages, disciplines, and professions. Its purpose is to foster a community of pioneers that invent novel concepts, materials, products, experiences, and services that seek to bridge the gap between academia and Industry4.0. Furthermore, it contributes with skills, collaborative tools and transnational communities leading to awareness, reinvention and resilience.

The participants of the program pursue careers that introduce new professional roles such as: body architect, material developer, fashion technology consultant, interactive performer, digital craftsman, high-tech accessories designer, trends influencer, 3D fashion designer among others.

## Fabricademy has the following objectives:

- » Provide participants with theoretical and technical knowledge about disruptive technologies, materials and processes that are transforming today's industry and create the culture and conditions to innovate and change.
- » Gain a broad perspective of the textile industry and develop critical thinking to integrate sustainable design strategies that consider environmental, ethical and societal challenges.
- » Focus on multidisciplinary and develop a range of skills that combine crafts and interactive technologies, traditional fashion design and digital, analog and digital haute couture to generate emerging opportunities and create new hybrid professions. Create career development opportunities for professional women to acquire technical positions, confidence, leadership and entrepreneurial skills to promote gender parity in the leadership of the textile and fashion industry.



## State of the art, project management and documentation

17/09/2024 | Fabricademy Coordination

In the introduction class we will introduce the team coordinating the academy and contextualize the scope of the program. The program explores the interrelation of human-technology-environment through the notions of embodiment, materiality, ecodesign, biodesign, performance, smart textiles and digital fabrication. Fabricademy is a transdisciplinary program with a mission to (re)shape and (re)define the implications and applications of technology in the textile and clothing industry, from the fashion sector to the upcoming wearable market. It offers a broad overview of the state of the art of the current industry and builds on "learning by doing" methodologies, tackling themes like personal fabrication, distributed manufacturing, industry 4.0, wearable technology, biofabrication, assistive technologies and sustainability.

Highlighting the common values and principles for which the program stands for and the framework in which we will operate. The class will give the participants an overview of the main aspects and tools for documenting their work, in order to be able to shape their personal websites. These tools will be put into practice by describing the possible final project and drafting a first sketch of it in their documentation websites.



## Digital Bodies

24/09/2024 | Anastasia Pistofidou

Throughout our history we observe that the human body and its representation are of high importance in arts, sciences, medicine, psychology, etc.

A fashion designer uses the human figure as his white paper to produce his masterpiece. In the same way authors were using pencil and paper, then typewriter, keyboard and currently voice dictation, the tools of the fashion designer evolved through time.

On the way of enabling mass customization, the fashion industry is claiming for new tools that can scan and fabricate unique digitally tailored garments. How can one have access to a digital tailor that responds to his specific needs?

This class introduces new digital tools that complement hand tools in order to design, represent, make and modify the human figure that can then be used as a canvas for creation. We challenge the fashion designer to step away from the simple copy of the human figure as support of his work and start his creative process from its very beginning : the design of the canvas itself.

During this class you will have an overview of tools and software that you can use for design and prototyping your ideas. You will get the basic training and safety measurements for using the infrastructure of the laboratory. Fabricademy participants will scan themselves and create a scale 1:1 human figure.



## Open Source Circular Fashion

01/10/2024 | Zoe Romano

In this class the lecture will outline the systems behind fashion and the textile industry, focusing on alternative systems such as circular fashion, agile fashion, open value chains. The focus will be on creating modular elements, structures and connections that allow the user to change the shape of a garment, resize it or replace certain elements. Participants will publish their creations on open source platforms and learn how to monitor and promote their creations in a distributed network.

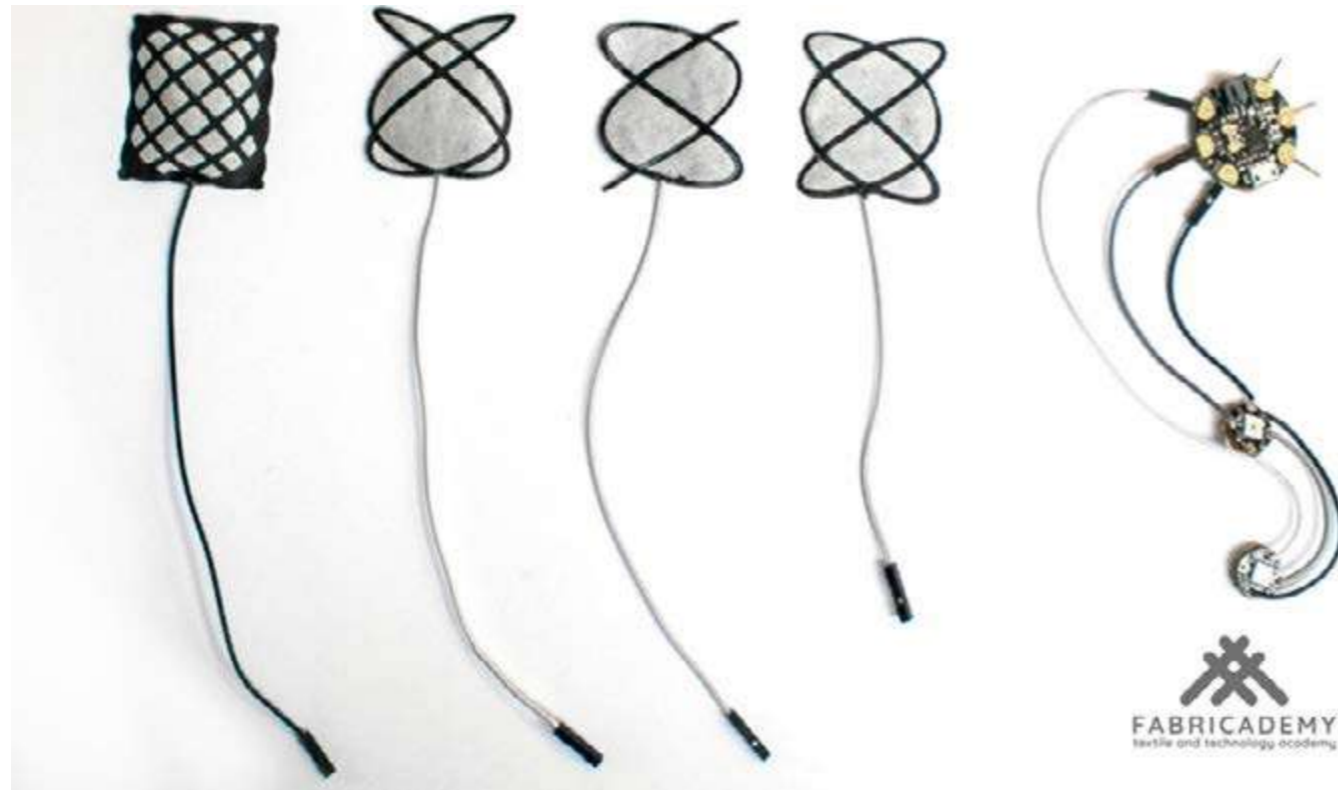


## Biochromes

08/10/2024 | Cecilia Raspanti

The textile industry is one of the most polluting in the world, in which one of the most environmentally disastrous processes is the dyeing of fibers and textiles of the clothes we wear. Chemicals are released daily in rivers and nature destroying the environment around us to satisfy the colour demands that we create as designers, industry and consumers. Very few options are being explored in this fast changing fashion, clothing and textile industry, and the list of chemical treatments is only expanding.

This class will focus on exploring colouring alternatives to the current ones. Bridging craftsmanship techniques and technology, to explore alternative colour sources and their processing. Ranging from plant based, insect base and bacteria based pigments.



## E-textiles

15/10/2024 | Liza Stark

Fabricademy participants will be introduced to an overview of the field of electronic textiles, example works in the field as well as materials and technical developments that have made these projects possible. We will go into details on different techniques for making soft/flexible/fabric circuits. We will also introduce idea of microcontrollers using ATTINY as an example. We will cover simple exercise of opening blink LED example, going over the code basic and uploading to have the first step into arduino programing.

The exercise for the week will be to replicate/copy the swatch example, program your own ATTINY microcontroller with example code and design a basic circuit using the techniques of your choice.

We ask each participant to create at least one analog fabric sensor and one digital sensor we mention in the course. Then create a fabric circuit using one or more of the connection technique (embroidered circuit, laser cut circuit, vinyl cut circuit) we cover in the course. They can connect the sensors simply with LED and a battery, or connect with programmed ATTINY to give a behavior to the fabric circuit. One can use buzzer speaker instead of LED as an actuator.

## Biofabricating Materials

22/10/2024 | Cecilia Raspanti

This last century we have been crafting, designing and growing materials independently from their future use. This has caused major design flaws in our daily lives, where we find ourselves surrounded by plastics, while observing knowledge about local materials and techniques disappear and left unused even when in abundance.

This class will focus on exploring material alternatives to the current ones. By bridging craftsmanship techniques and today's easier access to technologies, we explore alternative material resources in order to craft their processing and develop products and materials hand in hand.





## Computational Couture

29/10/2024 | Julia Körner

Disciplines as programming and electronics become highly interconnected, blurring old boundaries and merging different fields of knowledge. Fashion has been already affected by this radical change. Therefore, clothes, shoes and other accessories can now incorporate elements of hardware and software, generating a peculiar mix between fashion and computation that is incredibly fertile and inspiring. Data becomes Beauty, Interaction becomes Emotion. As a result, a new aesthetic is emerging. In this class participants will explore computational design methods towards a new reinterpretation of cloths, garments and accessories for fashion design, inspired by a new digital design methodology.

This class requires basic knowledge of Rhinoceros, Grasshopper. Participants should bring their own laptop with a pre-installed software. The software package needed has no additional cost for the participant (Rhino can be downloaded as evaluation version, Grasshopper and plugins are free). These software are subject to frequent updates, so a download link to the version used in the workshop will be sent to the participants a few days before the workshop.



## Wearables

05/11/2024 | Liza Stark

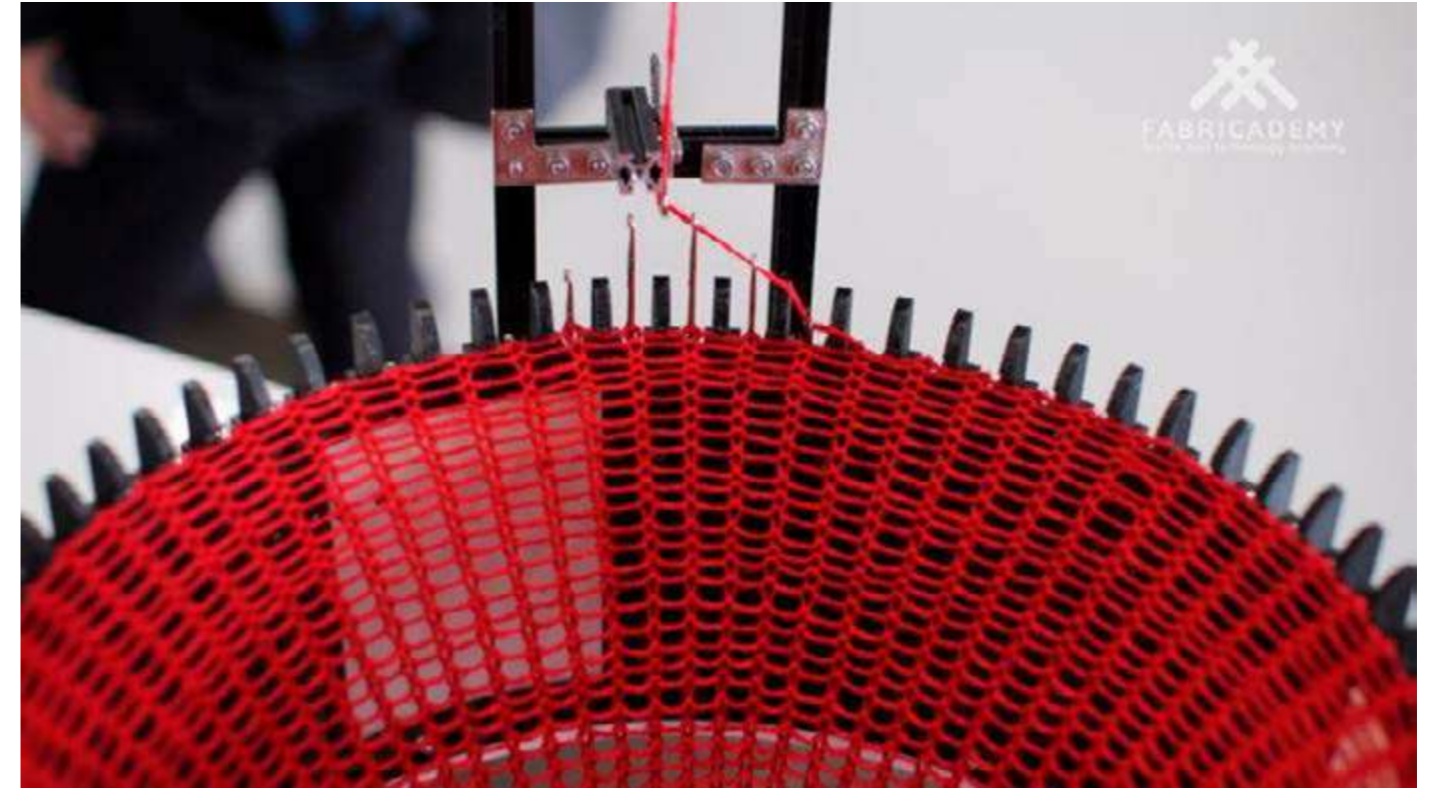
This second class on the topic of wearables and e-textiles will provide a more advanced coverage on soft sensors and actuators.



## Soft Robotics

12/11/2024 | Dr. Lily Chambers & Adriana Cabrera

This class will focus in the study of a specific field in robotics, the soft robotics. Unlike rigid robots we are mostly used to, soft bodied robots have similarities and performance characteristics similar to living organisms or the human body. Soft-robotics are based in Bio-inspired design or biomimicry and have applications in wearables, rehabilitation prosthetics, surgical robots, rescuing and others. We will focus on the fabrication of soft actuators, sensors and grippers using novel materials, artificial muscles and performative locomotion design.



## Open source Hardware - from fibers to fabrics

19/11/2024 | Sara Diaz

The class explores the Open Source Hardware field in general and focuses on its potential in the area of textile. How to update obsolete machines for producing textile? How to take advantage of digital fabrication and open source technology to come up with an open source machine for knitting, weaving and invent new techniques.

This class focuses on the importance of the techniques, tools and machines that create traditional fabrics. The lecture will give an overview on the evolution of these tools and how these impact production and manufacturing, with the focus on hacking, both machines and tools, and creating open source accessible machinery for a broader public.



## Textile as Scaffold

26/11/2024 | Anastasia Pistofidou

Technical textiles have various applications, among which agrotech, building, clothes, geotech, sports, healthcare. This class broadens the perspective of the techniques, processes and applications of technical textiles with references and inspiration of various disciplines. Fabricademy participants are asked to use textiles and fibers to create a textile scaffold or use textile as formwork for their structures.



## Skin electronics

03/12/2024 | Katia Vega

Inspired by invisible computing, augmenting human capabilities and magic, this class proposes novel ways of interacting with the world. The focus is on Katia Vega's Beauty Technology, a wearable computing subfield that integrates technology into cosmetics to be applied directly to one's skin, fingernails and hair in order to transform the body's surface in an interactive platform. Conductive Makeup, Tech Nails, FX e-makeup and Hairware are some of Beauty Technologies. Connect your body with environment and enhance your communication.



## Implications and applications

10/12/2024 | Oscar Tomico

Recent developments in electronics, software programming and service design are shaking the current notions of what a textile is. Societal trends like a renewed interest in crafts, the need for a sustainable mass production system and the emergence of personalization are reshaping the way the fashion system works. By means of a series of conceptual garments and research exemplars carried out at the Wearable Senses Lab at Eindhoven University of Technology, this talk illustrates the challenges and the space of opportunities emerging where (wearable) tech meets (fashion) design.

During this week participants are called to start working on their final project proposal that they will be developing from January to March. They will pitch their proposal in the format of a presentation or a video of 5' maximum.



## Project Proposal

17/12/2024 | Fabricademy  
Coordination

Participants' final projects ideas will be presented during this session and built during the two-month project development phase.

## Personal Project Development

From January to March 2025

## Review on Gantt, Process & Workflow

14/01/2025 | Fabricademy  
Coordination

## Focus Group - Mentoring Session

28/01/2025 | Fabricademy  
Coordination & Mentors

## Mid Term Presentations

11/02/2025 to 14/02/2024 |  
Fabricademy Coordination

## Focus Group - Mentoring Sessions

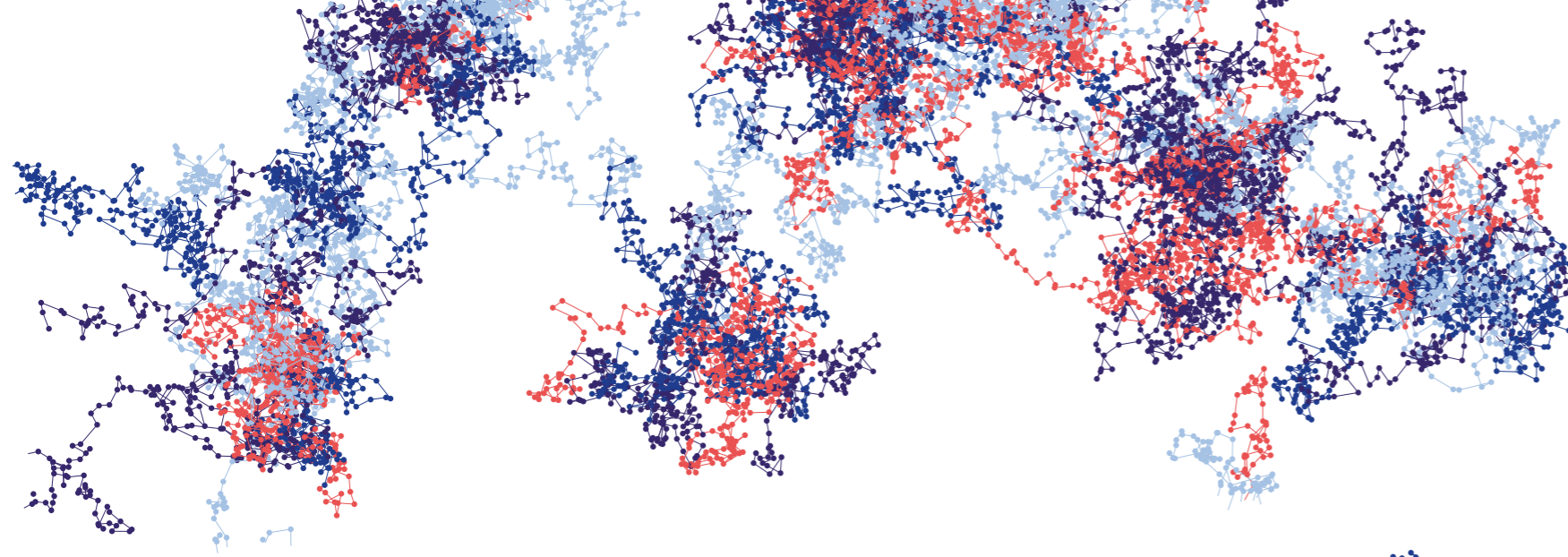
25/02/2025 | Fabricademy  
Coordination & Mentors

## Review on Storytelling & Final prototype

11/03/25 | Fabricademy Coordination

## Final Project Presentations

25-28/03/2025 | Fabricademy  
Coordination & Jury Members



**Apply today in this journey at the intersection of Textiles, Digital fabrication and Biology!**

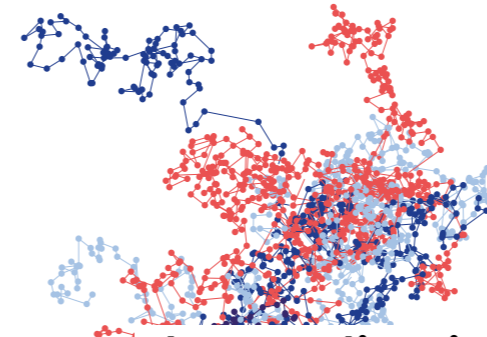
### **Full Academy**

- » 6 months
- » 25 global lectures
- » 40+ online
- » tutorials
- » 35+ hands-on workshops
- » global reviews and personal mentorship
- » 13 weeks of personal project development
- » diploma

**Early Bird:** Apply by 31st of May to get up to \$500 off!

**\$7500 | \$8000\***

(Europe, USA, Canada)



### **The Application Process**

After you fill in this form, the lab/node you selected will review your profile and inform you about the results of the selection. If you cannot send a link of your portfolio, please send it directly as an attachment at [info@textile-academy.org](mailto:info@textile-academy.org)

Once the Lab/Node approves your application, you will agree on the terms of your participation with the Node staff.

You must secure 100% of the Fabricademy fees before the program starts, end September, in one or 2 payments to Fabricademy Central Administration.

### **Payment details**

The tuition fees for the complete academy program in Europe, the US, and Canada amount to \$8000. Participants will be required to submit a confirmation fee upon acceptance into the program, followed by a subsequent payment prior to the commencement of the course. The tuition fee covers all necessary materials for the completion of the 13 assignments, access to a co-working space for a duration of 6 months, complimentary use of machinery, mentorship from experts at local labs, as well as online classes and tutorials guided by global experts. Additionally, participants' progress will be evaluated throughout the course both locally and globally.

# Basque BioDesign Center

Biodiseño & Tecnología



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