



UNIVERSITÀ  
DEGLI STUDI  
DI FERRARA  
- EX LABORE FRUCTUS -



UNIMORE  
UNIVERSITÀ DEGLI STUDI DI  
MODENA E REGGIO EMILIA

Master degree in

Innovation design

### **Master degree in Innovation design**

The Degree Course in "Innovation Design" is delivered in English and is reserved for a maximum of 40 students. The course is inter- university between the University of Ferrara (Department of Architecture and Engineering Department) and the University of Modena and Reggio Emilia (Enzo Ferrari Engineering Department and Department of Engineering Sciences and Methods). The Degree Course is conceived to take into account the inputs from national and international operators and stakeholders, and is based on a deep analysis of the national and international offer, with the declared aim of creating an original profile compared to current industrial design courses.



## "What to study"

The contents of the Course refer to the following thematic areas:

### **1- Area of "Innovation design for human needs".**

It has the task of providing skills, methods and tools to develop innovative design projects based on people's needs. It also has the task of educating at working in multidisciplinary teams.

### **2- Area of "Innovation Engineering".**

It has the task of providing expertise, methods and tools for the development of technological solutions and implementation processes that enable the feasibility and sustainability of innovative products and services. It also has the task of educating to the quantitative evaluation of the project and its relationship with industrial actuality.

### **3-Area of Innovation Management.**

It has the task of providing skills, methods and tools for scenario and market analysis, for defining strategies and project management of innovative products and services. It also has the task of educating to the understanding and interfacing with organizations, agencies and structures that allow to reach the market and the society for which products and services are conceived.

### **4- "Synthesis" area.**

It has the task of providing technical methodologies and strategies for the synergic application of the skills and tools learned during the Course, in the development of the project that is the final thesis work. Three final workshops are offered, closely linked to the entrepreneurial history of the involved towns : Educational Technology Innovation (Reggio Emilia), Mobility innovation (Modena) and Health and wellness innovation (Ferrara), during which students will have the opportunity to work in direct contact with a specific industrial reality and to verify their self-management and project - planning skills.

## TOPICS



## "Which professional you become"

With the Master's Degree in Innovation Design you became an expert in developing continuous innovation of products, processes and services. The figure of the Innovation Designer has various opportunities in the professional and business activities in the field of design.

In particular, he can carry out self-employment, professional activity as an employee for both SMEs and manufacturing and service companies, professional activity as a collaborator or consultant in design studies. You can find employment at the public administration and at institutions and research organizations.



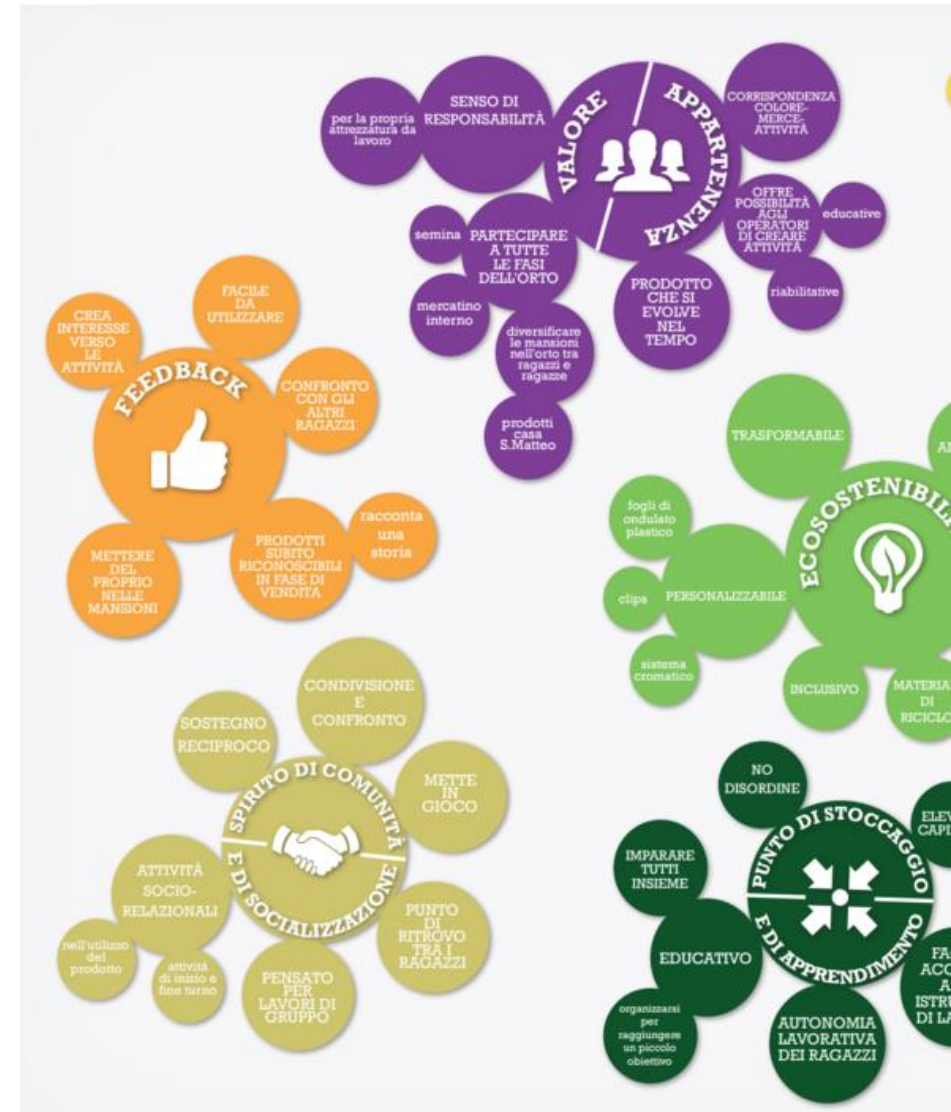
## Fields of application

The training course is defined by the contribution of different disciplinary areas, by the relationship with the Technopoles (High Specialization University Research Centers) and by a close synergy with the manufacturing and service sectors involved in this field, both in training and research.

All industry sectors are potentially interested, as not only manufacturers, but also service providers, both b-to-c and b-to-b, do use methodologies such as Design Thinking or QFD (Quality Function Deployment) for development of innovative product-service formulas.

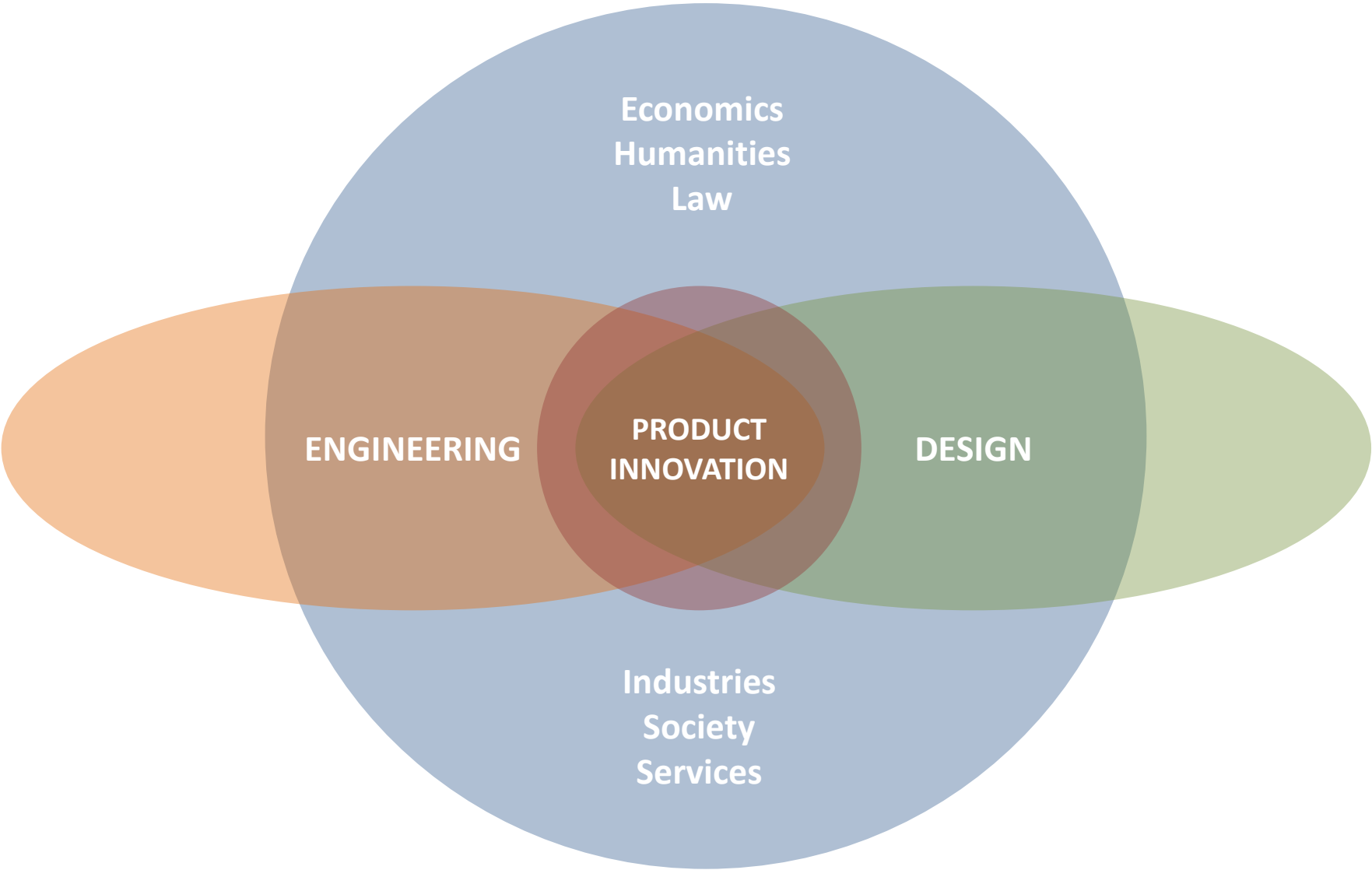
The most appropriate application fields for the development of a synergic didactic project, in Emilia Romagna are:

- Biomedical
- Automotive
- Mechatronics
- Automation
- Food
- Entertainment
- Creative industries
- Wellness











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## International Master of Science in «Innovation design»

The course offers the advantage of abilities, skills and cultures of four very different organisations: Technical Departments, the "Enzo Ferrari" and «Dismi» Department of Engineering of Modena and Reggio Emilia University and the «Endif» Department of Engineering of Ferrara University, and a Design Department: the DA Architecture Department of Ferrara University.

The result is an original training path where designers learn how to integrate humanistic culture of design approach (human centered design) and research methodologies which come from applied sciences in engineering approach, in order to develop disruptive innovation in industrial products and services.

The course fosters a collaborative approach involving multidisciplinary team working and encourages external companies involvement.



### Master Degree in Innovation design

Durata: 2 Anni

1 ° anno: formazione metodologica e tecnica avanzata

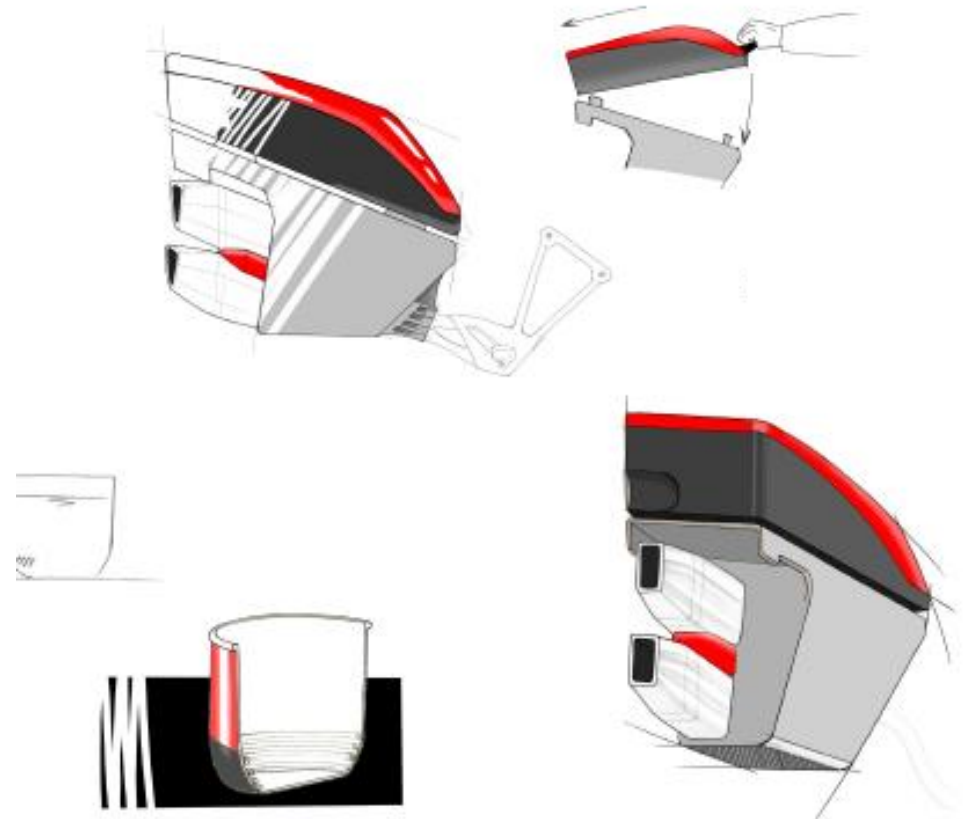
2 ° anno: esperienze di progettazione avanzata in laboratori di progetto multidisciplinari, in contatto con industrie innovative.

Lingua di erogazione: Inglese

Rivolto sia a studenti che a professionisti esperti.

Topics:

**Design thinking, Human Based Innovation, Design methods, Managing Product Innovation, Strategic and Sustainable Design, Digital transformation, Internet of things, Advanced manufacturing, Smart Systems and Technology , Sustainable Design Engineering, User experience, Innovation management, Product and service definition, Entrepreneurship.**





# FIRST YEAR (starts 2017-18)

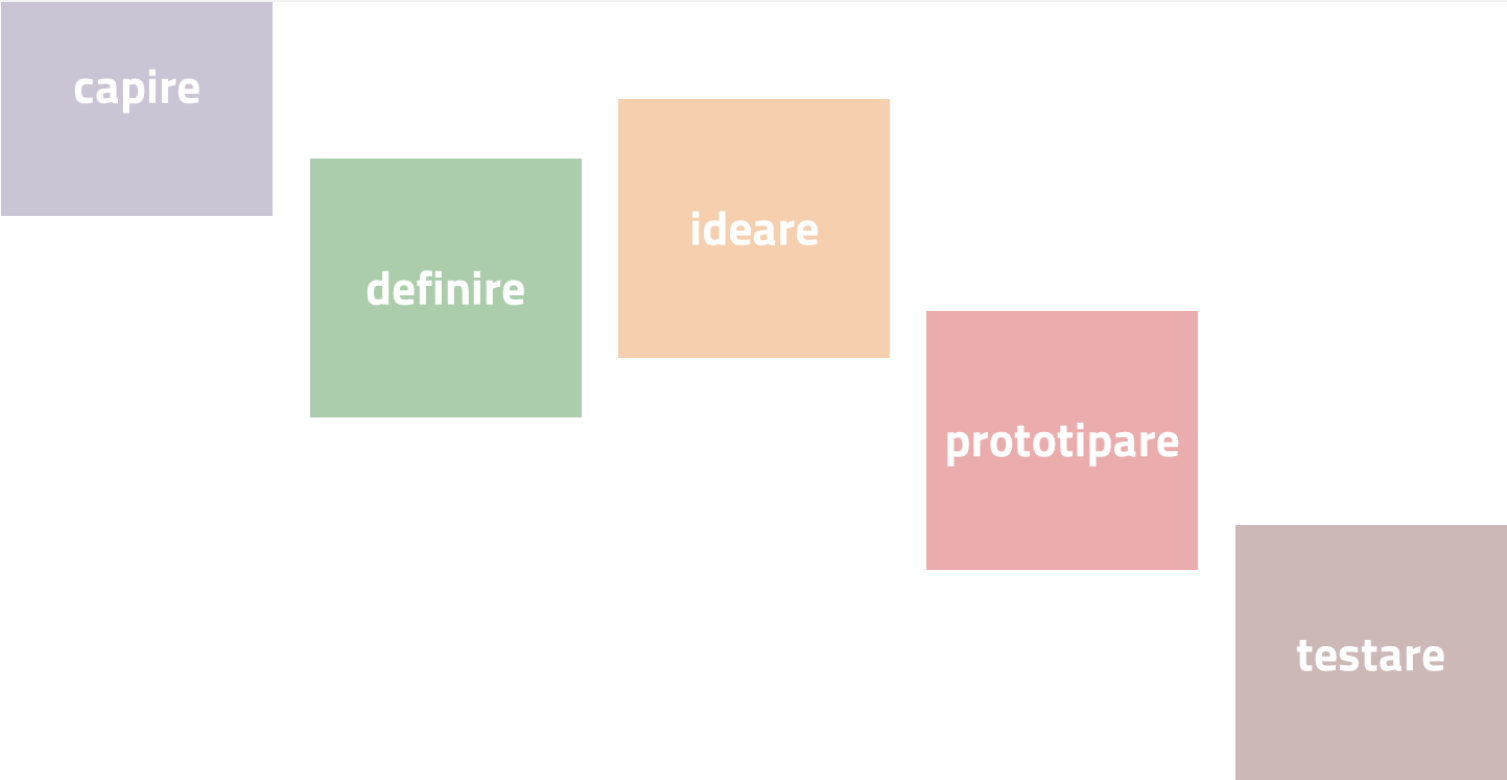
## COURSE LAYOUT

| N | semester | course                                       | SSD        | AF | CFU | Type<br>L/T | hours | Town Site |
|---|----------|----------------------------------------------|------------|----|-----|-------------|-------|-----------|
| 1 | 1        | <b>Design thinking methods Lab.</b>          |            |    | 21  |             | 210   | FE        |
|   |          | Human Centered Design                        | ICAR/13    | B1 | 9   | L           | 90    | FE        |
|   |          | Human environments design                    | ICAR/14    | C  | 3   | T           | 30    | FE        |
|   |          | Design methods                               | ING-IND/35 | B3 | 9   | L           | 90    | FE        |
| 2 | 2        | <b>Multimodal Concept design Lab.</b>        |            |    | 18  |             | 180   | FE        |
|   |          | Multimodal design                            | ICAR/13    | B1 | 9   | L           | 90    | FE        |
|   |          | Automatic design for concept generation      | ING-IND/15 | B2 | 6   | L           | 60    | FE        |
|   |          | Concept design tools                         | ICAR/17    | C  | 3   | L           | 30    | FE        |
| 3 | 2        | <b>Design management for Innovation Lab.</b> |            |    | 15  |             | 150   | FE        |
|   |          | Integrated design                            | ICAR/13    | B1 | 6   | L           | 60    | FE        |
|   |          | Design validation                            | ING-IND/16 | C  | 3   | T           | 30    | FE        |
|   |          | Design evaluation                            | ICAR/22    | C  | 3   | T           | 30    | FE        |
|   |          | Innovation management                        | SECS-P/06  | C  | 3   | T           | 30    | FE        |

FIRST YEAR  
FIRST SEMESTER

COURSES

|                              |            |                                                                                          |     |
|------------------------------|------------|------------------------------------------------------------------------------------------|-----|
| Design thinking methods Lab. |            | Design in teamwork based on human needs and design thinking methodology                  | 210 |
| Human Centered Design        | ICAR/13    | History and theory of innovation, Inclusive design, Design for all, User centered design | 90  |
| Human environments design    | ICAR/14    | Culture of design innovation. Innovation for quality of spaces.                          | 30  |
| Design methods               | ING-IND/35 | Design thinking and product definition, design management                                | 90  |

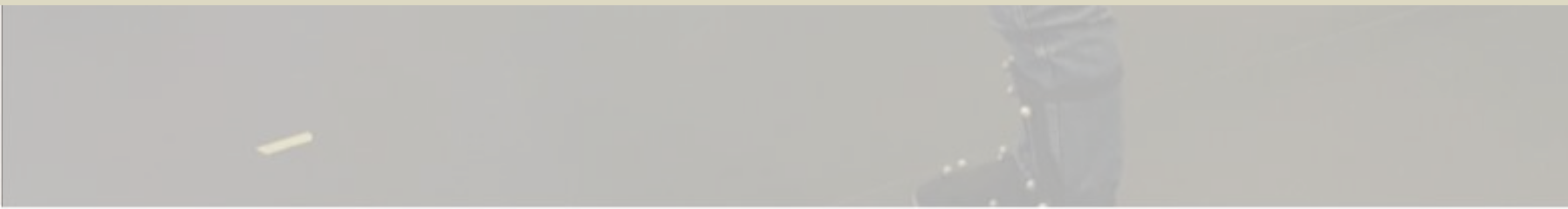


# FIRST YEAR SECOND SEMESTER

## COURSES



| Multimodal Concept design Lab.          |            | Visual thinking and multimodal communication for team work and concept generation                                                     | 180 |
|-----------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------|-----|
| Multimodal design                       | ICAR/13    | Visual thinking, multimodal communication of concepts and ideas, Interface design, interaction design, UX design                      | 90  |
| Automatic design for concept generation | ING-IND/15 | Teamwork 3d modelling, virtual prototyping, design for, parametric 3d modelling, automatic concept generation, interaction simulation | 60  |
| Concept design tools                    | ICAR/17    | Concept sketching, concept prototyping, rapid rendering, sketching for teamwork, concept presentation, storytelling                   | 30  |

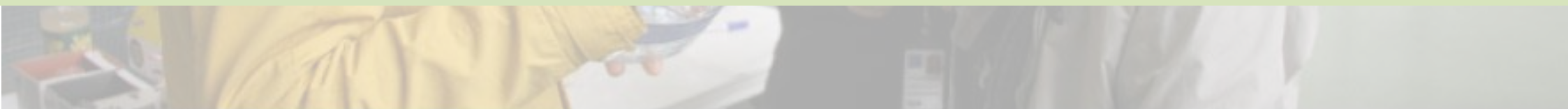


# FIRST YEAR SECOND SEMESTER

## COURSES



|                                              |            |                                                                                                                                          |            |
|----------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Design management for Innovation Lab.</b> |            | <b>Economics, marketing, management for design innovation development</b>                                                                | <b>150</b> |
| Integrated design                            | ICAR/13    | Integrated design of product and services. Design to market, value analysis, solutions benchmarking, personalizations and customizations | 60         |
| Design validation                            | ING-IND/16 | From virtual to physical prototypes, advanced industrial technological processes, design to cost.                                        | 30         |
| Design evaluation                            | ICAR/22    | Project evaluation, Budgeting, Pricing and cost management, Program management, Risk analysis.                                           | 30         |
| Innovation management                        | SECS-P/06  | Market and scenario analysis. Strategy and marketing for innovation development. Statistics.                                             | 30         |





## SECOND YEAR (starts 2018-19)

## COURSE LAYOUT

| N   | semester | course                                                                                                             | SSD        | AF | CFU | Type L/T | hours | Town Site |
|-----|----------|--------------------------------------------------------------------------------------------------------------------|------------|----|-----|----------|-------|-----------|
| 4   | 1        | <b>Smart technologies for sustainable design Lab.</b>                                                              |            |    | 24  |          | 240   | FE        |
|     |          | Smart and sustainable design                                                                                       | ICAR/13    | B1 | 6   | L        | 60    | FE        |
|     |          | Interactive and smart products engineering                                                                         | ING-IND/14 | B2 | 6   | L        | 60    | FE        |
|     |          | Sustainable engineering                                                                                            | ING-IND/10 | C  | 3   | T        | 30    | FE        |
|     |          | Smart spaces design                                                                                                | ICAR12     | C  | 3   | T        | 30    | FE        |
|     |          | ICT for smart products                                                                                             | ING-INF/05 | B2 | 6   | L        | 60    | FE        |
| 5   | 1        | <b>Final Synthesis Lab 1 - Final Thesis Design</b>                                                                 | ICAR/13    | B1 | 6   | L        | 60    | FE        |
| 6   |          | <b>Final Synthesis Lab 2:</b> possibile scelta di una delle tre opzioni elencate con sede in tre province diverse* |            |    |     |          |       |           |
| 6.1 | 2        | <b>Final Synthesis Lab 2- Educational technology innovation</b>                                                    |            |    | 12  |          | 120   |           |
|     |          | Educational Product Design                                                                                         | ICAR/13    | D  | 3   | L        | 30    | RE        |
|     |          | Smart Product Engineering                                                                                          | ING-IND/14 | D  | 3   | L        | 30    | RE        |
|     |          | Systems and communications for educational smart objects                                                           | ING-INF/03 | D  | 3   | L        | 30    | RE        |
|     |          | Automation and interaction for educational smart objects                                                           | ING-INF/04 | D  | 3   | L        | 30    | RE        |
| 6.2 | 2        | <b>Final Synthesis Lab 2- Mobility innovation</b>                                                                  |            |    | 12  |          | 120   | MO        |
|     |          | Automotive Product Design                                                                                          | ICAR/13    | D  | 3   | L        | 30    | MO        |
|     |          | Product Engineering for automotive                                                                                 | ING-IND/14 | D  | 3   | L        | 30    | MO        |
|     |          | Engineering methods for automotive                                                                                 | ING-IND/15 | D  | 3   | L        | 30    | MO        |
|     |          | Information Technology for automotive                                                                              | ING-INF/05 | D  | 3   | L        | 30    | MO        |
| 6.3 | 2        | <b>Final Synthesis Lab 2- Health and wellness innovation</b>                                                       |            |    | 12  |          | 120   | FE        |
|     |          | Product Design for Health                                                                                          | ICAR/13    | D  | 3   | L        | 30    | FE        |
|     |          | Product Engineering for biomedical and wellness                                                                    | ING-IND/13 | D  | 3   | L        | 30    | FE        |
|     |          | Materials and product performances for biomedical and wellness                                                     | ING-IND/22 | D  | 3   | L        | 30    | FE        |
|     |          | Smart ICT for biomedical and wellness                                                                              | ING-INF/05 | D  | 3   | L        | 30    | FE        |

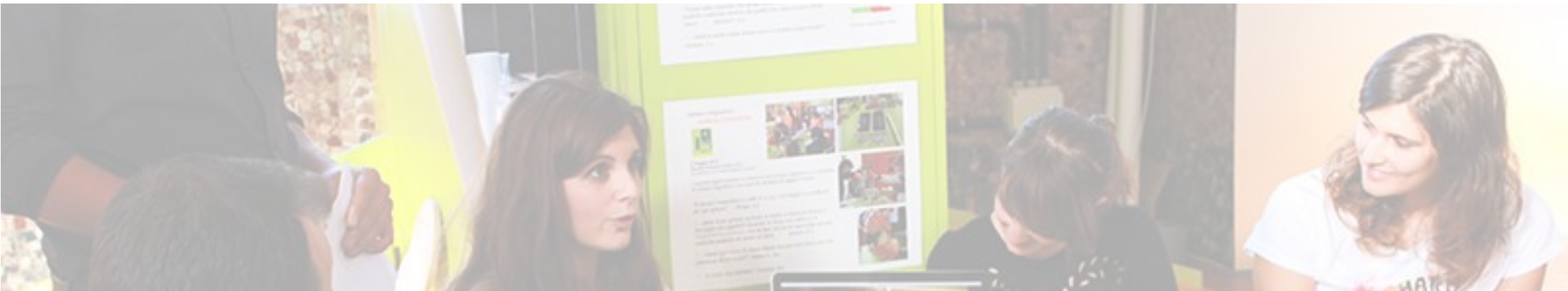
**SECOND YEAR  
FIRST SEMESTER**

**COURSE**

| <b>Smart technologies for sustainable design Lab.</b> |            | <b>Design of smart products and services, Internet of things, Advanced technologies for sustainable innovation</b>                                       | <b>240</b> |
|-------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Smart and sustainable design                          | ICAR/13    | Eco design, design of smart objects, app design, big data visualization, service design                                                                  | 60         |
| Interactive and smart products engineering            | ING-IND/14 | Smart technologies, product and system engineering, integrated product and process design, mechatronics                                                  | 60         |
| Sustainable engineering                               | ING-IND/10 | Engineering of sustainable products and services, renewable resources, low impact technologies, manufacturing and assembly, green design, sustainability | 30         |
| Smart spaces design                                   | ICAR12     | Environmental design of smart and responsive spaces for dwelling, working and leisure                                                                    | 30         |
| ICT for smart products                                | ING-INF/05 | Internet of things, controls, sensors, data management, software for smart and interactive products                                                      | 60         |

## SECOND YEAR FIRST SEMESTER

## COURSE



|                              |         |                                                                                                                                                                                                           |           |
|------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Final Synthesis Lab 1</b> |         |                                                                                                                                                                                                           | <b>60</b> |
| Final Thesis Design          | ICAR/13 | Team work design methods,<br>Multidisciplinary design product definition. QFD. Product Specifications.<br>System design analysis.<br>Customer, users and needs analysis.<br>Innovative design development | 60        |



SECOND YEAR  
SECOND SEMESTER

COURSE

|                                                          |            |                                                                                                         |     |
|----------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------|-----|
| Final Synthesis Lab 2                                    |            | Design and prototyping of smart toys for educational, learning, and entertainment purposes for children | 120 |
| Option 1 – Reggio Emilia                                 |            |                                                                                                         |     |
| Educational technology innovation                        |            |                                                                                                         |     |
| Educational Product Design                               | ICAR/13    |                                                                                                         | 30  |
| Smart Product Engineering                                | ING-IND/14 |                                                                                                         | 30  |
| Systems and communications for educational smart objects | ING-INF/03 |                                                                                                         | 30  |
| Automation and interaction for educational smart objects | ING-INF/04 |                                                                                                         | 30  |

SECOND YEAR  
SECOND SEMESTER

COURSE

|                                                                           |            |                                                                |     |
|---------------------------------------------------------------------------|------------|----------------------------------------------------------------|-----|
| Final Synthesis Lab 2<br><br>Option 2 – Modena<br><br>Mobility innovation |            | Design and<br>prototyping of vehicle systems<br>and components | 120 |
| Automotive Product Design                                                 | ICAR/13    |                                                                | 30  |
| Product Engineering for automotive                                        | ING-IND/14 |                                                                | 30  |
| Engineering methods for automotive                                        | ING-IND/15 |                                                                | 30  |
| Information Technology for automotive                                     | ING-INF/05 |                                                                | 30  |

**SECOND YEAR**  
**SECOND SEMESTER**

**COURSE**

|                                                                                                            |            |                                                                                        |            |
|------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------|------------|
| <b>Final Synthesis Lab 2</b><br><br><b>Option 3 – Ferrara</b><br><br><b>Health and wellness innovation</b> |            | <b>Design and prototyping of tools and products for biomedical, sports and fitness</b> | <b>120</b> |
| Product Design for Health                                                                                  | ICAR/13    |                                                                                        | 30         |
| Product Engineering for biomedical and wellness                                                            | ING-IND/13 |                                                                                        | 30         |
| Materials and product performances for biomedical and wellness                                             | ING-IND/22 |                                                                                        | 30         |
| Smart ICT for biomedical and wellness                                                                      | ING-INF/05 |                                                                                        | 30         |

**SECOND YEAR**  
**TRAINEE AND THESIS**

**COURSE**

| Attività                | AF | CFU |
|-------------------------|----|-----|
| Traineeship             | F  | 12  |
| Thesis work development | E2 | 9   |
| Thesis dissertation     | E2 | 3   |



