

## PaperPro23

**Course for Higher Technician for the management and control of paper production**

<http://www.itsprime.it/corsi/nuovi-corsi/paperpro23-lucca/>

### **Type of course:**

two-year course after secondary school Diploma or after the 4-year Diploma of Vocational Education and Training (VET) integrated by a one-year Higher Technical Education and Training (IFTS) course.

### **Teaching location:**

the course will take place at the operational headquarters in **Lucca c/o Formetica , Piazza Bernardini 41 - Lucca**. Part of the activities may be held in the technological laboratories of the universities, companies and entities that collaborate with the ITS Prime Foundation. They may also be held occasionally in facilities of educational or scientific interest located elsewhere. The internships can take place in companies located in any part of the regional, national and/or European territory.

**Registration deadline:** October 25, 2023

### **Type of final Diploma:**

Diploma in " HIGHER TECHNICIAN FOR THE INNOVATION OF MECHANICAL PROCESSES AND PRODUCTS " (Area 4.3 Mechanical System - Figure 4.3.2 of Annex D - Interministerial Decree 07/09/2011) with indication of specialization of the course in **“COURSE FOR HIGHER TECHNICIAN FOR THE MANAGEMENT AND CONTROL OF PAPER PRODUCTION” with the certification of skills corresponding to the fifth level of the European Qualifications Framework - EQF.**

In order to facilitate circulation at national and European level, the certificate is accompanied by EUROPASS certification.

### **Entry requirements:**

possession of secondary school diploma or after the 4-year Diploma of Vocational Education and Training (VET) integrated by a one-year Higher Technical Education and Training (IFTS) course;

age between 18 to 35 years (not completed on the call deadline date);

basic skills in English and ICT.



Female candidates and/or candidates belonging to disadvantaged categories who have been successful in the selection process will be automatically admitted to participate in the course as trainees, up to the limit of the number of places allocated to them (50% of places to women, 7% to disadvantaged categories in accordance with the provisions of Law 68/1999).

**Type of access:**

programmed number: 25 students

**Selection mode**

The selection of participants includes:

curricular evaluation by qualifications and experiences,  
a written test,  
a motivational interview.

**Method of enrollment:**

see link: <http://www.itsprime.it/corsi/nuovi-corsi/paperpro23-lucca/>

**Methods of recognition of previous training courses:**

The student at the time of enrollment may request the recognition of training courses, formal or non-formal, producing the documentation that attests them. The request is submitted to the judgement of the Scientific Technical Committee that evaluates the coherence of the previous training courses with the Training Units and the modules of the course that the student is going to attend. On this basis the Scientific Technical Committee indicates which modules can be recognized as already learned by the student. Requests for recognition of training credits received after the selection date will not be evaluated.

**Profile of the course**

The “HIGHER TECHNICIAN FOR THE MANAGEMENT AND CONTROL OF PAPER PRODUCTION” has the ability to use innovative materials and cutting-edge technologies to improve the quality, productivity, flexibility, and competitiveness of paper companies.

**Main expected learning outcomes**

The **PaperPro23** graduate has the competence to:

- know and control the production system of the paper industry and its production plants both for paper products for domestic use and for personal hygiene as well as those used in packaging
- intervene in the production process in order to guarantee the quality level of the final product required by the customer



- know the main production processes aimed at obtaining natural virgin fibres and recycled paper to be used as raw materials in paper production processes
- know the auxiliary plants for paper production (e.g. vacuum, compressed air, water treatment, etc.)
- know and perform process and product controls
- check and adjust process parameters in its various phases
- be able to read a technical drawing and design product packaging
- be able to understand the activities related to the environmental management system and monitor energy consumption
- know the internal logistics of the paper mill
- be able to define, plan and carry out checks on the finished product
- be able to use and apply industrial automation and data analysis tools
- be able to carry out plant maintenance, assembly and testing activities.

### **Didactic plan**

The two-year course, of 1800 hours in total, takes place in 4 semesters with a didactic articulation that provides:

classroom lessons and laboratory activities (1100 hours), internship, in Italy and abroad (700 hours). Any foreign internships are carried out with the European Erasmus+ programme.

Lesson time: from a minimum of 4 to a maximum of 8 hours per day.

The entire training course is carried out in close connection with the mechanic sector companies. The teaching team is composed of at least 50% of experts from the world of production, professions and work with a specific professional experience in the field. In particular is involved the staff of the companies partners of ITS Prime Foundation.

Teachers from the School, University, Research Centres and Vocational Training will also be involved. Seminars, testimonies of key protagonists in the sector and visits to fairs, events, companies and installations of particular interest will complete the path of studies.

### **Possibility of access to further studies**

The diploma may be integrated into a subsequent university course, with recognition of university credits (CFU) on the basis of the didactic regulations of the individual universities. In this regard, please refer to the regulations in force.

### **Regulations for the conduct of exams and other forms of school profit assessment**

Each ITS PRIME course is biennial and consists of Training Units, divided into Didactic Modules.

At the end of each Didactic module, a 100-scale assessment is planned. For the modules with many hours of lessons, intermediate verifications are foreseen. Students, after having attended the course for at least 80% of the total hours of lessons, and having obtained in all the Didactic modules at least 60/100, are admitted to take the final exam. The exam consists of a written test with multiple choice tests, a technical-practical test, an interview. The fundamental part of interview is the discussion of a work experience , designed and



prepared during the internship period. By passing the exam, students acquire the Diploma of Higher Technician, a qualification corresponding to the 5st level of the European Qualifications Framework EQF

## **Course structure**

### **Training Units and Didactic Modules**

#### UFC 1 - EMPOWERMENT E TEAM BUILDING

- 1.1 Outdoor Training (in ambiente esterno)
- 1.2 Laboratorio di Self Empowerment e Team Building
- 1.3 Problemsetting and solving - decision making - time management

#### UFC 2 - ORIENTATION TOWARDS WORK AND ENTERPRISE

- 2.1 The enterprise and the employment relationship (contracts)
- 2.2 Company organisation and organisation charts
- 2.3 Supply chain management

#### UFC 3 - LANGUAGE SKILLS

- 3.1 English Theory
- 3.2 English Laboratory
- 3.3 Technical English

#### UFC 4 - THE COMPANY SYSTEM

- 4.1 The corporate organisational system: roles, operational functions and professional figures
- 4.2 Sector analysis
- 4.3 Safety and accident prevention in the workplace (high risk)
- 4.4 Green enterprise; iso 14000, sustainability and eco-compatibility of industrial production

#### UFC 5 - TECHNICAL SKILLS

- 5.1 Use of EXCEL in advanced functions
- 5.2 Physics recalls (mechanics, thermodynamics)
- 5.3 Recalls of infinitesimal calculation

#### UFC 6 - PRODUCTION PROCESSES AND PAPER MILL EQUIPMENT

- 6.1 Overview of the complete production process
- 6.2 Papermaking plants
- 6.3 Company tour - paper mill installations
- 6.4 Inlet and process water treatment
- 6.5 Stock preparation
- 6.6 VALMET Simulator Exercise (Area Laboratory)
- 6.7 Paper machine



- 6.8 Dressing, coating and surface treatment elements
- 6.9 Plant and process for paper recycling

#### UFC 7 - PRODUCTION PROCESSES AND PAPERMAKING PLANTS

- 7.1 Overview of the complete tissue production process
- 7.2 Plant for converting and packaging tissue products
- 7.3 View of the complete production process-Packaging
- 7.4 Plants for the converting of packaging products

#### UFC 8 - PAPER AND BOARD PRODUCTS

- 8.1 Analysis of main products
- 8.2 Product characteristics
- 8.3 Laboratory instruments and quality control of supply chain products

#### UFC 9 - RAW MATERIALS AND SEMI-FINISHED PRODUCTS IN THE PAPER INDUSTRY

- 9.1 Analysis of plant sources of fibrous raw materials, extraction techniques, characteristics
- 9.2 Specific products used in the process: starches, fillers, glues, resins, colorants
- 9.3 Packaging materials
- 9.4 Laboratory instruments, characteristics and input controls

#### UFC 10 - PAPER CHEMISTRY

- 10.1 Basic chemical processes for papermaking
- 10.2 Chemical by-products, additives and related technologies
- 10.3 Basic analyses for paper
- 10.4 Product safety data sheets

#### UFC 11 - AUTOMATION AND DATA ANALYSIS TOOLS (PERFORMANCE MANAGEMENT) INDUSTRY 4.0

- 11.1 Electrical power systems: distribution, motors, PDS
- 11.2 Instrumentation, sensors, wiring and communication protocols
- 11.3 Control systems: models, feedback, stability, PID control
- 11.4 Continuous quality control systems (e.g. QCS)
- 11.5 Introduction to PLC/DCS (SIEMENS Territorial Lab)
- 11.6 Pneumatic/hydraulic logic and automation
- 11.7 Application of 4.0 technologies for control and data analysis

#### UFC 12 - TECHNICAL PLANT MANAGEMENT

- 12.1 Machine assembly and testing
- 12.2 Troubleshooting methodologies and techniques
- 12.3 Preventive and predictive maintenance
- 12.4 Energy Efficiency
- 12.5 Spare Parts Warehouse
- 12.6 Application of 4.0 technologies in maintenance activities



### UFC 13 - MECHANICAL TECHNICAL DRAWING AND PACKAGING DESIGN

- 13.1 Interpretation of technical mechanical drawings
- 13.2 Basic 2D CAD course
- 13.3 Packaging design

### UFC 14 - ENERGY AND ENVIRONMENT

- 14.1 Energy Production and Energy Management
- 14.2 The environment management system
- 14.3 Effluent treatment: analysis, legislation, plants
- 14.4 Atmospheric emissions
- 14.5 Waste treatment
- 14.6 Circular economy: recyclability of packaging and cellulose-based products
- 14.7 COMIECO sustainability report presentation

### UFC 15 - LOGISTICS

- 15.1 Internal plant logistics
- 15.2 External logistics

### UFC 16 - INTERNSHIP

- 16.1 Company internships

## Timetable and credits for teaching modules

Acronym	PaperPro23					
Title	Higher Technician for the management and control of paper production					
Modules Code	Teaching	Hours UFC	Hours First year	Hours Second year	Credits First year	Credits Second year
	<b>UFC 1 - EMPOWERMENT E TEAM BUILDING</b>	<b>32</b>	<b>First year</b>			
1.1	Outdoor Training (in ambiente esterno)	8	8			
1.2	Laboratorio di Self Empowerment e Team Building	12	12		2	
1.3	Problemsetting and solving - decision making - time management	12	12			
	<b>UFC 2 - ORIENTATION TOWARDS WORK AND ENTERPRISE</b>	<b>30</b>		<b>Second year</b>		
2.1	The enterprise and the employment relationship (contracts)	10		10		
2.2	Company organisation and organisation charts	10		10		3
2.3	Supply chain management	10		10		
	<b>UFC 3 - LANGUAGE SKILLS</b>	<b>40</b>	<b>First year</b>			
3.1	English Theory	12	12		2	
3.2	English Laboratory	16	16		2	
3.3	Technical English	12	12		2	
	<b>UFC 4 - THE COMPANY SYSTEM</b>	<b>78</b>	<b>First year</b>			
4.1	The corporate organisational system: roles, operational functions and professional figures	8	8		1	
4.2	Sector analysis	4	4			
4.3	Safety and accident prevention in the workplace (high risk)	58	58		3	
4.4	Green enterprise: iso 14000, sustainability and eco-compatibility of industrial production	8	8		1	
	<b>UFC 5 - TECHNICAL SKILLS</b>	<b>30</b>	<b>First year</b>			
5.1	Use of EXCEL in advanced functions	15	15		1	
5.2	Physics recalls (mechanics, thermodynamics)	10	10			
5.3	Recalls of infinitesimal calculation	5	5		2	
	<b>UFC 6 - PRODUCTION PROCESSES AND PAPER MILL EQUIPMENT</b>	<b>150</b>	<b>First year</b>			
6.1	Overview of the complete production process	26	26		2	
6.2	Papermaking plants	26	26			
6.3	Company tour - paper mill installations	4	4		2	
6.4	Inlet and process water treatment	22	22		2	
6.5	Stock preparation	20	20			
6.6	VALMET Simulator Exercise (Area Laboratory)	8	8		1	
6.7	Paper machine	20	20		1	
6.8	Dressing, coating and surface treatment elements	12	12		2	
6.9	Plant and process for paper recycling	12	12			
	<b>UFC 7 - PRODUCTION PROCESSES AND PAPERMAKING PLANTS</b>	<b>100</b>	<b>First year</b>			
7.1	Overview of the complete tissue production process	20	20			
7.2	Plant for converting and packaging tissue products	30	30		4	
7.3	View of the complete production process-Packaging	20	20			
7.4	Plants for the converting of packaging products	30	30		4	
	<b>UFC 8 - PAPER AND BOARD PRODUCTS</b>	<b>60</b>	<b>First year</b>			
8.1	Analysis of main products	8	8		1	
8.2	Product characteristics	16	16		1	
8.3	Laboratory instruments and quality control of supply chain products	36	36		2	
	<b>UFC 9 - RAW MATERIALS AND SEMI-FINISHED PRODUCTS IN THE PAPER INDUSTRY</b>	<b>42</b>	<b>First year</b>			
9.1	Analysis of plant sources of fibrous raw materials, extraction techniques, characteristics	10	10		1	
9.2	Specific products used in the process: starches, fillers, glues, resins, colorants	8	8		1	
9.3	Packaging materials	8	8		1	
9.4	Laboratory instruments, characteristics and input controls	16	16		1	
	<b>UFC 10 - PAPER CHEMISTRY</b>	<b>20</b>	<b>First year</b>			
10.1	Basic chemical processes for papermaking	4	4			
10.2	Chemical by-products, additives and related technologies	4	4			
10.3	Basic analyses for paper	6	6		3	
10.4	Product safety data sheets	6	6			
	<b>UFC 11 - AUTOMATION AND DATA ANALYSIS TOOLS (PERFORMANCE MANAGEMENT) INDUSTRY 4.1</b>	<b>130</b>		<b>Second year</b>		
11.1	Electrical power systems: distribution, motors, PDS	16		16		2
11.2	Instrumentation, sensors, wiring and communication protocols	26		26		3
11.3	Control systems: models, feedback, stability, PID control	20		20		3
11.4	Continuous quality control systems (e.g. QCS)	4		4		
11.5	Introduction to PLC/DCS (SIEMENS Territorial Lab)	25		25		2
11.6	Pneumatic/hydraulic logic and automation	25		25		3
11.7	Application of 4.0 technologies for control and data analysis	14		14		2
		<b>90</b>		<b>Secondo anno</b>		
12.1	Machine assembly and testing	15		15		2
12.2	Troubleshooting methodologies and techniques	15		15		2
12.3	Preventive and predictive maintenance	20		20		3
12.4	Energy Efficiency	8		8		1
12.5	Spare Parts Warehouse	12		12		1
12.6	Application of 4.0 technologies in maintenance activities	20		20		3
	<b>UFC 13 - MECHANICAL TECHNICAL DRAWING AND PACKAGING DESIGN</b>	<b>68</b>	<b>First year</b>			
13.1	Interpretation of technical mechanical drawings	16	16		1	
13.2	Basic 2D CAD course	36	36		2	
13.3	Packaging design	16	16		1	
	<b>UFC 14 - ENERGY AND ENVIRONMENT</b>	<b>90</b>	<b>First year</b>			
14.1	Energy Production and Energy Management	20	20		2	
14.2	The environment management system	16	16		1	
14.3	Effluent treatment: analysis, legislation, plants	16	16		1	
14.4	Atmospheric emissions	16	16		1	
14.5	Waste treatment	10	10		1	
14.6	Circular economy: recyclability of packaging and cellulose-based products	8	8			
14.7	COMIECO sustainability report presentation	4	4		1	
	<b>UFC 15 - LOGISTICS</b>	<b>40</b>	<b>First year</b>			
15.1	Internal plant logistics	20	20		2	
15.2	External logistics	20	20		2	
	<b>UFC 16 - INTERNSHIP</b>	<b>800</b>		<b>Second year</b>		
16.1	Company internships			800		30
	<b>TOTAL HOURS</b>	<b>1800</b>	<b>750</b>	<b>1050</b>	<b>60</b>	<b>60</b>





### ECTS credit system

For each course, ITS PRIME has adopted the credit calculation according to the credit system used in the European Higher Education Area ECTS (European Credit Transfer System). For one-year credits, 60 credits are provided, as for most Higher Education Institutions. Typically 1 credit is equivalent to 25 hours of work between classroom (or laboratory for practical activities) and individual study. For each Didactic Module, the workload required by the students to achieve the expected learning outcomes has been evaluated by evaluation experts and modules teachers. The hours of lessons were considered 30% or 50% of the hours of the workload according to the theoretical or theoretical-practical nature of the different modules. The time spent on the internship in the company and for the laboratory activities was considered 100% of the workload.

### Language of lessons

Italian

### Course calendar

<b>Start-up</b>	<b>September</b>	<b>2023</b>
<b>Preliminary Lessons on fundamental topics to the understanding of the course</b>	<b>October</b>	<b>2023</b>
<b>End of first year</b>	<b>June</b>	<b>2024</b>
<b>Second-year start</b>	<b>September</b>	<b>2024</b>
<b>Early stage italia</b>	<b>February</b>	<b>2025</b>
<b>Start of foreign internship (if any)</b>	<b>May</b>	<b>2025</b>
<b>End of the course</b>	<b>September</b>	<b>2025</b>
<b>Final examination</b>	<b>October</b>	<b>2025</b>

### Information on the organisation of tutoring and mentoring services

For each course a coordinator and a tutor will be appointed, who will follow and monitor the didactic activities and solve any collective or personal problems of the students.

Accompanying activities to achieve the best learning outcomes will be:





Accompanying activities	Individual hours	Group hours	Total hours
<b>Initials</b>			
Presentation and training agreement		2	2
Individual analysis	2		50
Preliminary Lessons on fundamental topics to the understanding of the course		32	32
<b>Additional training</b>			
English conversation	4		100
Laboratory of production synthesis		48	48
<b>Stage alignment</b>			
Collective orientation internship		4	4
Individual orientation internship	1		25
<b>Accompaniment</b>			
Collective accompaniment		20	20
Individual accompaniment	1		25
<b>Totale</b>	<b>8</b>	<b>106</b>	<b>306</b>

Calculation based on the number of students = 25