

ECOLINE24

HIGHER TECHNICIAN FOR ECO-SUSTAINABLE MECHANICAL TECHNOLOGIES FOR PAPERMAKING

<https://www.itsprime.it/corsi-itsprime/ecoline24/>

The course is fully funded by PR Tuscany ESF+ 2021 - 2027, with D.D 13362 of 11/06/24 and is included in the framework of Giovanisi (www.giovanisi.it), the project of the Tuscany Region for the autonomy of young people.

Free for participants.

Participants who live more than 50 km away from the course location will receive a **contribution** to reimburse the expenses incurred for **food and accommodation**. The contribution will be granted only on condition that the participant successfully completes the ITS training course in which he/she is enrolled.

The ITS Prime Foundation has also provided for the award of **Scholarships** on the basis of merit and income. The terms and criteria for allocation and disbursement will be defined and communicated to students attending with appropriate notices and regulations.

Type of course:

Two-year course in higher education.

Teaching location:

the course will take place mainly at the ITS PRIME locations in **Lucca, in Piazza Bernardini 41**. Some 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 structures of educational or scientific interest located elsewhere. The internships may take place in companies located in any part of the regional, national and/or European territory.

Registration deadline: 18th October 2024, 11pm.

Type of final Diploma:

Diploma in " HIGHER TECHNICIAN FOR DESIGN AND ADVANCED MECHATRONIC PRODUCTION" (Ambito 6.1 - Sviluppo e innovazione del processo e del prodotto - Figura



6.1.1 dell'allegato 1 – DM 203 del 20.10.2023) with indication of specialization of the course in “**HIGHER TECHNICIAN FOR ECO-SUSTAINABLE MECHANICAL TECHNOLOGIES FOR PAPERMAKING**” with the certification of the competences corresponding to the **European Qualifications Framework for lifelong learning (EQF) level 5** and constitutes a qualification for access to public competitions pursuant to Art. 5, paragraph 7, of the D.P.C.M 25 January 2008.

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 (IFTTS) course;

age between 18 to 35 years old (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:

classes can be made up of a **minimum number of 20 students** as required by current national regulations on the matter and a **maximum of 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: <https://www.itsprime.it/corsi-itsprime/ecoline24/>

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 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.

Course Objectives.

The course "ECOLINE24 - Eco-sustainable mechanical technologies for paper production" trains professionals specialized in the design, construction and maintenance of systems used in the paper and paper-making industries.

The skills acquired range from mechanics to electronics, up to the control and management of production processes and environmental sustainability.

Main job opportunities

Production manager in companies

Mechanical designer and maintenance worker in industries and offices

Quality control officer in systems

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 (1000 hours),

internship, in Italy and abroad (800 hours). Any foreign internships are carried out with the European Erasmus+ programme.

Lesson time: Monday to Friday with a weekly commitment of 35-40 hours. Interruptions in teaching activities will be planned for holidays, summer and winter vacations.

The entire training course is carried out in close connection with the mechanic sector companies. The teaching team is composed of at least 70% 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 the final exam. The exam consists of technical-practical tests and an interview.

Course structure

Training Units and Teaching Modules

UFC 1 - EMPOWERMENT AND TEAM BUILDING

- 1.1 Outdoor Training (in an external environment)
- 1.2 Self Empowerment and Team Building Laboratory
- 1.3 Problem setting and solving - decision making - time management

UFC 2 - ORIENTATION TO WORK AND BUSINESS

- 2.1 The company and the employment relationship (contracts)
- 2.2 Company organization and organizational charts
- 2.3 Conciliation and gender equality
- 2.4 The ISO9001:2015 quality system
- 2.5 Safety and hygiene in the workplace

UFC 3 - LANGUAGE SKILLS

- 3.1 Business language
- 3.2 Writing technical logistic documents
- 3.3 Translating technical documents

UFC 4 - DIGITAL SKILLS

- 4.1 Use of EXCEL in advanced functions
- 4.2 Power Point presentations

UFC 5- TECHNICAL SKILLS

- 5.1 Recall of infinitesimal calculus
- 5.2 DC electrical circuits
- 5.3 Thermal and thermodynamic processes
- 5.4 Recall of mechanical physics

UFC 6 - PAPER PRODUCTION PROCESSES AND PLANTS

- 6.1 View of the complete production process
- 6.2 Paper production plants
- 6.3 Continuous machine



- 6.4 Treatment of incoming and process water
- 6.5 Digital Twins solutions: VALMET Simulator

UFC 7 PRODUCTION PROCESSES AND PLANTS - TISSUE PAPER PRODUCTION

- 7.1 View of the complete production process - tissue
- 7.2 Plants for the transformation and packaging of tissue products
- 7.3 Sizing of tissue line
- 7.4 View of the complete production process - packaging
- 7.5 Plants for the transformation of packaging products
- 7.6 Sizing of packaging line

UFC 8 PRODUCTION PROCESSES AND PLANTS - CORRUGATED CARDBOARD

- 8.1 View of the complete production process
- 8.2 Corrugated line
- 8.3 Box factory line

UFC 9 PRODUCTION PROCESSES AND PLANTS - NONWOVEN

- 9.1 Airlaid technology
- 9.2 production plant (fiber selection, web formation, bonding, and finishing techniques)

UFC 10 ELECTRICAL ENGINEERING, PLANTS AND MACHINES ELECTRICAL

- 10.1 AC electrical systems
- 10.2 Power electronics and converters
- 10.3 Electrical machines: transformer, AC motor
- 10.4 Industrial electrical systems
- 10.5 Electrical engineering and measurement laboratory

UFC 11 INDUSTRIAL TECHNICAL DRAWING

- 11.1 Mechanical drawing regulations
- 11.2 Pneumatics and Oleodynamics
- 11.3 2D CAD drawing
- 11.4 3D CAD DRAWING
- 11.5 RAPID PROTOTYPING, ADDITIVE MANUFACTURING
- 11.6 CNC PROGRAMMING LANGUAGE



11.7 PROJECT WORK

UFC 12 MECHANICS FOR THE PAPER AND PAPER INDUSTRY

- 12.1 Mechanics of machines
- 12.2 Motion transmission, gear wheels, belts, reducers
- 12.3 Dynamics of rotating parts
- 12.4 Mechanical solutions typical of the paper industry
- 12.5 Mechanical solutions typical of the paper industry
- 12.6 Revamping of existing machines
- 12.7 Mechanical measurement laboratory
- 12.8 PROJECT WORK

UFC 13 MECHANICAL CONSTRUCTION TECHNIQUE

- 13.1 STATICS OF STRUCTURES
- 13.2 SOLID MECHANICS
- 13.3 MECHANICAL PROCESSING TECHNOLOGY
- 13.4 PROJECT WORK

UFC 14 INDUSTRY AUTOMATION 4.0

- 14.1 PLANT SUPERVISION
- 14.2 DIGITAL ELECTRONICS
- 14.3 INDUSTRIAL INSTRUMENTATION
- 14.4 AUTOMATIC CONTROLS; PID REGULATORS
- 14.5 PLC PROGRAMMING (Siemens)
- 14.6 FUNCTIONAL SAFETY OF ELECTRICAL SYSTEMS (EN ISO 13849-1)
- 14.7 PROJECT WORK

UFC 15 MANAGEMENT, TECHNOLOGICAL AND REGULATORY TOOLS

- 15.1 EU Machinery Regulation 2023/1230 and other applicable directives
- 15.2 STATISTICAL TOOLS FOR MECHANICAL QUALITY
- 15.3 PROJECT MANAGEMENT OF AN ORDER
- 15.4 PRODUCTION PROGRAMMING (MRP) AND INTERNAL PLANT LOGISTICS
- 15.5 PLANTS MAINTENANCE MANAGEMENT (TMP)
- 15.6 BUSINESS CASE PRESENTATION
- 15.7 COMPANY PERFORMANCE EVALUATION (KPI, OEE etc.)
- 15.8 PROJECT WORK



UFC 16 ENVIRONMENTAL SUSTAINABILITY IN THE PAPER SECTOR

- 16.1 Energy production and energy consumption management
- 16.2 Green company; ISO 14000, sustainability and eco-compatibility of industrial production
- 16.3 Product LifeCycle Management (PLM)

UFC 17 - INTERNSHIP

- 17.1 Internship in the company



Timetable and credits for teaching modules

ECOLINE24						
Eco-sustainable Mechanical Technologies for Papermaking						
Acronym						
Title						
Modules Code	Teaching	Hours UFC	Hours First year	Hours Second year	Credits First year	Credits Second year
UFC1	UFC 1 - EMPOWERMENT AND TEAM BUILDING	24	First year		First year	
1.1	Outdoor Training (in an external environment)	8	8			
1.2	Self Empowerment and Team Building Laboratory	8	8		2	
1.3	Problem setting and solving, decision making, time management	8	8			
UFC2	UFC 2 - ORIENTATION TO WORK AND BUSINESS	72	First year		First year	
2.1	The company and the employment relationship (contracts)	12	12			
2.2	Company organization and organizational charts	8	8			
2.3	Conciliation and gender equality	4	4			
2.4	The ISO9001:2015 quality system	8	8		2	
2.5	Safety and hygiene in the workplace	40	40		2	
UFC3	UFC 3 - LANGUAGE SKILLS	60	First year		First year	
3.1	Business language	20	20		1	
3.2	Writing technical logistic documents	20	20		1	
3.3	Translating technical documents	20	20		1	
UFC4	UFC 4 - DIGITAL SKILLS	20	First year		First year	
4.1	Use of EXCEL in advanced functions	12	12		1	
4.2	Power point presentations	8	8		1	
UFC5	UFC 5 - TECHNICAL SKILLS	40	First year		First year	
5.1	Recall of infinitesimal calculus	8	8			
5.2	DC electrical circuits	12	12			
5.3	Thermal and thermodynamic processes	8	8			
5.4	Recall of mechanical physics	12	12		3	
UFC6	UFC 6 - PAPER PRODUCTION PROCESSES AND PLANTS	32	First year		First year	
6.1	View of the complete production process	4	4			
6.2	Paper production plants	12	12			
6.3	Continuous machine	8	8			
6.4	Treatment of incoming and process water	4	4			
6.5	Digital Twin solutions: VALMET Simulator	4	4		2	
UFC7	UFC 7 PRODUCTION PROCESSES AND PLANTS - TISSUE PAPER PRODUCTION	32	First year		First year	
7.1	View of the complete production process - tissue	4	4			
7.2	Plants for the transformation and packaging of tissue products	8	8			
7.3	Sizing of tissue line	4	4		2	
7.4	View of the complete production process - packaging	4	4			
7.5	Plants for the transformation of packaging products	8	8			
7.6	Sizing of packaging line	4	4			
UFC8	UFC 8 PRODUCTION PROCESSES AND PLANTS - CORRUGATED CARDBOARD	28	First year		First year	
8.1	View of the complete production process	4	4			
8.2	Corrugated line	16	16		2	
8.3	Box factory line	8	8			
UFC9	UFC 9 PRODUCTION PROCESSES AND PLANTS - NONWOVEN	12	First year		First year	
9.1	Airaid technology	4	4			
9.2	production plant (fiber selection, web formation, bonding, and finishing techniques)	8	8		1	
UFC10	UFC 10 ELECTRICAL ENGINEERING, PLANTS AND MACHINES ELECTRICAL	100	First year		First year	
10.1	AC electrical systems	24	24		2	
10.2	Power electronics and converters	8	8		1	
10.3	Electrical machines: transformer, AC motor	20	20		1	
10.4	Industrial electrical systems	20	20		1	
10.5	Electrical engineering and measurement laboratory	28	28		2	
UFC11	UFC 11 INDUSTRIAL TECHNICAL DRAWING	144	First year		First year	
11.1	Mechanical drawing regulations	16	16		1	
11.2	Pneumatics and Oleodynamics	20	20		1	
11.3	2D CAD drawing	20	20		1	
11.4	3D CAD DRAWING	40	40		2	
11.5	RAPID PROTOTYPING, ADDITIVE MANUFACTURING	8	8		1	
11.6	CNC PROGRAMMING LANGUAGE	20	20		1	
11.7	PROJECT WORK	20		20		4
UFC12	UFC 12 MECHANICS FOR THE PAPER AND PAPER INDUSTRY	124	First year		First year	
12.1	Mechanics of machines	20	20		2	
12.2	Motion transmission, gear wheels, belts, reducers	16	16		1	
12.3	Dynamics of rotating parts	12	12		1	
12.4	Mechanical solutions typical of the paper industry	16	16		1	
12.5	Mechanical solutions typical of the paper industry	16	16		1	
12.6	Revamping of existing machines	12	12		1	
12.7	Mechanical measurement laboratory	12	12		1	
12.8	PROJECT WORK	20		20		4
UFC13	UFC 13 MECHANICAL CONSTRUCTION TECHNIQUE	60	First year		First year	
13.1	STATICS OF STRUCTURES	16	16			
13.2	SOLID MECHANICS	16	16		2	
13.3	MECHANICAL PROCESSING TECHNOLOGY	8	8			
13.4	PROJECT WORK	20		20		4
UFC14	UFC 14 INDUSTRY AUTOMATION 4.0	92	First year		First year	
14.1	PLANT SUPERVISION	4	4			
14.2	DIGITAL ELECTRONICS	16	16			
14.3	INDUSTRIAL INSTRUMENTATION	8	8			
14.4	AUTOMATIC CONTROLS; PID REGULATORS	16	16		3	
14.5	PLC PROGRAMMING (Siemens)	20	20			
14.6	FUNCTIONAL SAFETY OF ELECTRICAL SYSTEMS (EN ISO 13849-1)	8	8		2	
14.7	PROJECT WORK	20		20		4
UFC15	UFC 15 MANAGEMENT, TECHNOLOGICAL AND REGULATORY TOOLS	108	First year		First year	
15.1	EU Machinery Regulation 2023/1230 and other applicable directives	12	12			
15.2	STATISTICAL TOOLS FOR MECHANICAL QUALITY	8	8		1	
15.3	PROJECT MANAGEMENT OF AN ORDER	20	20		2	
15.4	PRODUCTION PROGRAMMING (MRP) AND INTERNAL PLANT LOGISTICS	16	16			
15.5	PLANTS MAINTENANCE MANAGEMENT (TMP)	12	12			
15.6	BUSINESS CASE PRESENTATION	12	12			
15.7	COMPANY PERFORMANCE EVALUATION (KPI, OEE etc.)	8	8		3	
15.8	PROJECT WORK	20		20		4
UFC16	UFC 16 ENVIRONMENTAL SUSTAINABILITY IN THE PAPER SECTOR	52	First year		First year	
16.1	Energy production and energy consumption management	12	12		1	
16.2	Green company; ISO 14000, sustainability and eco-compatibility of industrial production	24	24		2	
16.3	Product Lifecycle Management (PLM)	16	16		1	
UFC17	UFC 17- INTERNSHIP	800		Second year		Second year
17.1	Internship in the company	800		800		40
TOTALE ORE		1800	900	900	60	60



ECTS credit system

For each course, ITS PRIME has adopted the calculation of credits according to the credit system used in the European Higher Education space ECTS (European Credit Transfer System). For the credits of an annuity there are, as for most Higher Education annuities, 60 credits. 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 necessary for students to achieve the intended learning outcomes was assessed by assessment experts and module teachers. Lecture hours were considered 30% or 50% of the total workload hours according to the theoretical or theoretical-practical nature of the different modules. Time spent on company internship and laboratory activities was considered 100% of the workload.

Language of lessons

Italian

Course calendar

The course will start by October 30, 2024 and will end by June 2026. The actual start date of the course will be communicated via the ITS Prime Foundation website (www.itsprime.it).

