

INDUSTRIAL SYSTEMS MECHATRONICS SPECIALIST

**HIGHER MECHATRONICS TECHNICIAN FOR THE INNOVATION AND DIGITISATION
OF INDUSTRIAL PRODUCTION AND SERVICE PROCESSES**

<https://www.itsprime.it/corsi-itsprime/industrial-systems-mechatronics-specialist/>

The course is free for participants. It is fully funded by the PR Toscana FSE+ 2021/2027, Priority 4, Activity 4.f.2 # ITS: allocation of resources to ITS training offer projects under DD 14894 of 02/07/2026, for pathways carried out by the ITS Academy Foundations of Tuscany starting in the 2026/2027 academic year, and is part of Giovanisì (www.giovanisi.it), the Tuscany Region project for youth autonomy.

Course type: Two-year Higher Technical Education course

Teaching location: The course will take place at the ITS PRIME Tech Academy site in **Firenze, Via Panciatichi 29**. Part of the activities may be held at the technological laboratories of universities, companies, and other organizations partnering with the ITS PRIME Tech Academy Foundation. Activities may also occasionally take place at facilities of particular educational or scientific interest located elsewhere. Internships (stages) may be carried out at companies located anywhere within the regional, national, and/or European territory.

Enrollment deadline: September 30, 2026.

Final diploma type

Diploma of "Higher Technician for Advanced Mechatronic Design and Production" (Area 6.1 - Process and Product Development and Innovation - Profile 6.1.1 of Annex 1 – Ministerial Decree 203 of 20.10.2023), specifying the course specialization as "**HIGHER MECHATRONICS TECHNICIAN FOR THE INNOVATION AND DIGITISATION OF INDUSTRIAL PRODUCTION AND SERVICE PROCESSES**", certifying competencies corresponding to Level V of the European Qualifications Framework for lifelong learning (EQF), and constituting a qualification for access to public competitive examinations pursuant to Art. 5, paragraph 7, of the D.P.C.M. of January 25, 2008.

Admission requirements:

Possession of a **Secondary School Diploma or a four-year Vocational Education and Training (leFP) pathway supplemented by a one-year Higher Technical Education**



and Training (IFTS) pathway;

Age between **18 and 35** (not yet reached by the application deadline);
Basic knowledge of the English language and computer skills.

Female candidates and/or candidates belonging to disadvantaged categories who are found suitable during the selection process will be automatically admitted to the course as students, up to the reserved quota assigned to them (50% of places for women, 7% for disadvantaged categories in accordance with Law 68/1999). Admission requirements will be verified during the selection process.

Admission type: Classes may be formed with a **minimum of 20 students**, as required by current national regulations, and a **maximum of 25 students**.

Selection process

The selection process involves:

- curricular evaluation based on qualifications and prior experience: a) Secondary School Diploma b) Any third-party certifications (such as ECDL or Cambridge ESOL, PET, and FCE certificates);
- a written test with multiple-choice questions aimed at assessing: a) General and basic knowledge of the subject area to which the ITS course relates; b) Knowledge of the English language;
- a motivational interview to assess: a) Candidates' motivations, aptitudes, and technical knowledge.

Method of enrollment:

please refer to the link: <https://www.itsprime.it/corsi-itsprime/industrial-systems-mechatronics-specialist/>

Recognition of previous training pathways

Any requests for recognition of training credits must be submitted in writing, together with appropriate documentation, by the course start date at the latest. A committee will evaluate the knowledge and skills acquired in other formal and informal contexts and, if the outcome is positive, will award credits in terms of training hours. This will allow the student to be exempted from attending the relevant UFCs (Capitalizable Training Units).

Course Objectives

The "INDUSTRIAL SYSTEM MECHATRONICS SPECIALIST" course trains mechatronics technicians to work across the fields of manufacturing, automation and industrial IT. The course combines mechanics, electronics and programming to prepare professionals capable of contributing to the digitalisation of production processes and technical services.



The work placement enables students to apply their skills within manufacturing companies, machine builders, systems integrators and organisations that are digitising their production and technical services.

Main job opportunities

Mechatronics technician.
Automation and supervision technician.
Process digitalisation technician.
Junior SCADA technician.
Industrial systems integration technician.
Production and maintenance support technician.

Didactic plan

The course will begin by November 2026 and end by August 2028. The actual start date of the course will be announced on the ITS Prime Tech Academy Foundation website (www.itsprime.it). The training pathway will be structured into 4 semesters for a total of **1,800 hours**:

- **Classroom lessons and laboratory activities: 1,040 hours**
- **Internships, in Italy and abroad: 760 hours**

Most of the subject areas will be delivered in technological laboratories specifically equipped with state-of-the-art technology. Part of the internship may be carried out, on a voluntary basis, at foreign companies, subject to obtaining specific scholarships under the Erasmus+ program. Access to the program will be through participation in a dedicated call, which must be successfully passed as a prerequisite for participation.

Class schedule: Monday to Friday, with a weekly commitment of 35-40 hours. Teaching activities will be suspended for holidays and summer/winter breaks. The entire training program is developed in close coordination with companies in the sector. Over 70% of the teaching staff will be composed of experts from the production, professional, and labor sectors with specific professional experience in the field, giving particular value to staff from companies that are members of the ITS PRIME Tech Academy Foundation. Teachers from universities, research centers, vocational training institutions, and schools will also be involved. The pathway will be complemented by seminar activities, testimonials from industry professionals, and visits to trade fairs, events, companies, and installations of particular interest. Throughout the course, learning assessments are scheduled to verify the actual achievement of the training objectives.

Access to further studies

The diploma may be combined with a subsequent university pathway, with recognition of



university training credits (CFU) based on the academic regulations of individual universities. Current legislation should be consulted in this regard.

Attendance benefits

Participants residing more than 50 km from the course location will be granted a contribution toward reimbursement of expenses incurred for meals and accommodation. The contribution will be paid only if the participant successfully completes the ITS training pathway in which they are enrolled. The ITS PRIME Tech Academy Foundation has also arranged for the awarding of Scholarships. The methods and criteria for allocating reimbursements and Scholarships will be defined and communicated to attending students through specific notices and regulations. It is possible to submit a request for a contribution or a Scholarship; however, the award is neither automatic nor guaranteed, but will be evaluated on a case-by-case basis according to the criteria established by current regulations.

Regulations for exams and other assessment methods

Each ITS PRIME Tech Academy course is two years long and consists of Capitalizable Training Units (UFC), each of which is divided into Teaching Modules. At the end of each teaching module, an assessment is scheduled, evaluated on a scale of 100. For modules with a high number of teaching hours, an interim assessment may also be scheduled.

Students who have attended at least 80% of the total teaching hours and have obtained a positive evaluation in all teaching modules are admitted to take the final ministerial exam, consisting of technical-practical tests and an interview.

Course structure

Training Units and Teaching Modules

UFC 1 - EMPOWERMENT AND TEAM BUILDING

- 1.1 Outdoor Training (outdoor environment)
- 1.2 Self Empowerment and Team Building Workshop
- 1.3 Problem setting and solving - decision making - time management

UFC 2 - JOB ORIENTATION AND SELF-ENTREPRENEURSHIP

- 2.1 The company and the employment relationship (contracts)
- 2.2 Company organization and organizational charts
- 2.3 Supply Chain Management

UFC 3 - THINKING INNOVATION: PHILOSOPHY AND DESIGN THINKING

- 3.1 Philosophical foundations of Design Thinking
- 3.2 Philosophy Workshop: The Agoras
- 3.3 Design thinking and critical thinking
- 3.4 The value of innovation: practical workshops



UFC 4 - LANGUAGE SKILLS

- 4.1 English theory
- 4.2 English workshop
- 4.3 Technical English

UFC 5 - QUALITY, SAFETY AND ENVIRONMENT

- 5.1 Quality policies in process management (ISO 9001)
- 5.2 Workplace safety and accident prevention (high risk) ISO 18000
- 5.3 Total Quality Management

UFC 6 - FUNDAMENTALS OF MECHANICAL TECHNOLOGY

- 6.1 Materials technology
- 6.2 Mechanical technologies
- 6.3 Mechanical measurements
- 6.4 Mechanics workshop - CNC programming

UFC 7 - CAD FUNDAMENTALS AND TECHNICAL DRAWING

- 7.1 Elements of industrial technical drawing
- 7.2 Regulations for industrial technical drawing
- 7.3 2D and 3D CAD
- 7.4 Reverse engineering techniques

UFC 8 - FUNDAMENTALS OF ELECTRONICS AND ELECTRICAL ENGINEERING

- 8.1 Basics of electrical engineering and electromagnetism
- 8.2 Analog and digital electronics
- 8.3 Control and drive systems - PLC
- 8.4 Electrical measurements
- 8.5 Electrical systems
- 8.6 Electronics workshop

UFC 9 - ORGANIZATION AND MANAGEMENT OF INDUSTRIAL PROCESSES

- 9.1 Technical/administrative management and control documentation
- 9.2 Elements of Project Management
- 9.3 Types and strategies of maintenance - KPIs
- 9.4 Types and analysis of failures and/or breakdowns
- 9.5 Cost management in maintenance
- 9.6 Elements of reliability theory
- 9.7 Failure mode prediction techniques

UFC 10 - ADVANCED MECHANICS

- 10.1 ISO language programming
- 10.2 CNC machining
- 10.3 Rapid prototyping

UFC 11 - DATABASE MANAGEMENT AND CLOUD COMPUTING

- 11.1 Design and management of relational databases



- 11.2 Non-relational databases and NoSQL
- 11.3 Big Data management and analysis
- 11.4 Cybersecurity

UFC 12 - APPLIED COMPUTER SCIENCE

- 12.1 Industrial operating systems
- 12.2 Fundamentals of Object-Oriented Programming
- 12.3 Programming languages
- 12.4 Augmented reality systems
- 12.5 SCADA and plant supervision
- 12.6 Applied computer science workshop

UFC13 - INDUSTRIAL AUTOMATION

- 13.1 Fundamentals of industrial automation
- 13.2 Industrial sensors
- 13.3 Actuators and drives
- 13.4 Embedded systems and industrial IoT
- 13.5 PLC and control logic
- 13.6 Integration and automated lines
- 13.7 Automation workshop

UFC 14 - INTERNSHIP

- 14.1 Company internship



Timetable and credits for teaching modules

Acronym	Industrial Systems Mechatronics Specialist						
Title	Higher Technician in Mechatronics for the innovation and digitalization of industrial production and service processes						
Mod.	Course	Module hours	Training Unit hours	First year	Second year	Training Credits First year	Training Credits Second year
	UFC 1 - EMPOWERMENT AND TEAM BUILDING		32	First year			
1.1	Outdoor Training (outdoor environment)	8		8		2	
1.2	Self Empowerment and Team Building Workshop	12		12			
1.3	Problem setting and solving - decision making - time management	12		12			
	UFC 2 - JOB ORIENTATION AND SELF-ENTREPRENEURSHIP		32	First year			
2.1	The company and the employment relationship (contracts)	8		8		2	
2.2	Company organization and organizational charts	12		12			
2.3	Supply Chain Management	12		12			
	UFC 3 - THINKING INNOVATION: PHILOSOPHY AND DESIGN THINKING		48	First year			
3.1	Philosophical foundations of Design Thinking	16		16		1	
3.2	Philosophy Workshop: The Agoras	8		8		1	
3.3	Design thinking and critical thinking	8		8		1	
3.4	The value of innovation: practical workshops	16		16		1	
	UFC 4 - LANGUAGE SKILLS		64	First year			
4.1	English theory	32		32		2	
4.2	English workshop	20		20		1	
4.3	Technical English	12		12		1	
	UFC 5 - QUALITY, SAFETY AND ENVIRONMENT		40	First year			
5.1	Quality policies in process management (ISO 9001)	8		8		3	
5.2	Workplace safety and accident prevention (high risk) ISO 18000	16		16			
5.3	Total Quality Management	16		16			
	UFC 6 - FUNDAMENTALS OF MECHANICAL TECHNOLOGY		80	First year			
6.1	Materials technology	20		20		1	
6.2	Mechanical technologies	20		20		1	
6.3	Mechanical measurements	16		16		1	
6.4	Mechanics workshop - CNC programming	24		24		1	
	UFC 7 - CAD FUNDAMENTALS AND TECHNICAL DRAWING		72	First year			
7.1	Elements of industrial technical drawing	8		8		1	
7.2	Regulations for industrial technical drawing	8		8			
7.3	2D and 3D CAD	36		36			
7.4	Reverse engineering techniques	20		20		1	
	UFC 8 - FUNDAMENTALS OF ELECTRONICS AND ELECTRICAL ENGINEERING		132	First year			
8.1	Basics of electrical engineering and electromagnetism	16		16		1	
8.2	Analog and digital electronics	16		16		1	
8.3	Control and drive systems - PLC	20		20		1	
8.4	Electrical measurements	20		20		1	
8.5	Electrical systems	20		20		1	
8.6	Electronics workshop	40		40		2	
	UFC 9 - ORGANIZATION AND MANAGEMENT OF INDUSTRIAL PROCESSES		68	First year			
9.1	Technical/administrative management and control documentation	20		20		1	
9.2	Elements of Project Management	8		8		1	
9.3	Types and strategies of maintenance - KPIs	8		8			
9.4	Types and analysis of failures and/or breakdowns	8		8			
9.5	Cost management in maintenance	8		8		1	
9.6	Elements of reliability theory	8		8			
9.7	Failure mode prediction techniques	8		8			
	UFC 10 - ADVANCED MECHANICS		76	First year			
10.1	ISO language programming	16		16		1	
10.2	CNC machining	40		40		2	
10.3	Rapid prototyping	20		20		1	
	UFC 11 - DATABASE MANAGEMENT AND CLOUD COMPUTING		88	First year			
11.1	Design and management of relational databases	32		32		2	
11.2	Non-relational databases and NoSQL	20		20		1	
11.3	Big Data management and analysis	20		20		1	
11.4	Cybersecurity	16		16		1	
	UFC 12 - APPLIED COMPUTER SCIENCE		152	First year			
12.1	Industrial operating systems	32		32		2	
12.2	Fundamentals of Object-Oriented Programming	24		24		2	
12.3	Programming languages	40		40		2	
12.4	Augmented reality systems	20		20		2	
12.5	SCADA and plant supervision	16		16		1	
12.6	Applied computer science workshop	20		20		1	
	UFC13 - INDUSTRIAL AUTOMATION		156	First year			
13.1	Fundamentals of industrial automation	24		24		1	
13.2	Industrial sensors	16		16		1	
13.3	Actuators and drives	16		16		1	
13.4	Embedded systems and industrial IoT	28		28		1	
13.5	PLC and control logic	24		24		1	
13.6	Integration and automated lines	28		28		1	
13.7	Automation workshop	20		20		1	
	UFC 14 - INTERNSHIP		760		Second year		
14.1	Company internship	760			760		60
	TOTAL HOURS		1800	1040	760	60	60



ECTS credit system

For each course, ITS PRIME Tech Academy 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

