INNOMEC22

Course for Higher Technician for the planning and the advanced mechanical workings

http://www.itsprime.it/corsi/nuovi-corsi/innomec22-tecnico-superiore-per-la-progettazione-e-le-lavorazioni-meccaniche-avanzate/

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:
Pistoia (PT)

Registration deadline: 25th January 2023

Type of final Diploma:
Diploma in "HIGHER TECHNICIAN FOR DESIGN AND ADVANCED MECHANICAL PRODUCTION " (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 " HIGHER TECHNICIAN FOR THE PLANNING AND THE ADVANCED MECHANICAL WORKING", with skills certification corresponding to level V of the European Qualifications Framework - EQF.**
In order to facilitate circulation at national and European level, the certificate shall be supplemented by the EUROPASS certification.

Entry requirements:
possession of secondary school diploma or of 4-year Diploma of Vocational Education and Training (IeFP) integrated by a one-year Higher Technical Education and Training (IFTS) course;
age between 18 to 30 years (not completed on the call deadline date);
basic skills in English and ICT.

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/innomec22-tecnico-superiore-per-la-progettazione-e-le-lavorazioni-meccaniche-avanzate/

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 evaluation of the Evaluation Commission that assesses the coherence of the previous training courses with the Training Units and the modules of the course that the student will have to attend. On this basis the Commission indicates which modules can be recognized as already learned by the student.

Profile of the course
The "HIGHER TECHNICIAN FOR THE PLANNING AND THE ADVANCED MECHANICAL WORKING " specializes in the design of machines and systems and in the industrialization of their production, in compliance with the design standards required, using the main enabling technologies of Enterprise 4.0 .

Main expected learning outcomes
The graduate of INNOVA20 has the competence:

1. to carry out the design development of the mechanical product using methods and techniques for inventive design, integrated and adaptive, based on the business needs of customization of the product and cost containment;
2. to realize the 2D CAD representation and the 3D CAD modeling of the mechanical product to develop technical tables of description of the project, to set up analysis of static type and kinematic and fluid dynamic simulations;
3. to support the simulation of the production process, in order to choose the materials most suitable for the realization of the components and to optimize the topology for the functional prototyping, the additive and/or subtractive production and the reverse engineering;
4. to manage the manufacturing technologies of the components, programming at CAM the machining paths of the part with subtractive technology and developing the code for their execution (CNC) or implementing the procedures for industrial 3D printing (Additive manufacturing);
5. to define maintenance procedures for production technologies to limit downtime;
6. to manage the production and assembly of mechanical components and products, adapting the configuration of specific operating equipment to better perform the required operations;

7. to collaborate in the definition of a plan of continuous improvement on the business processes (LEAN), realizing interventions of constant refinement of the productive cycle in order to optimize the quality of the products (TQM)

Possibility of access to further studies

The diploma can be integrated with a subsequent university course, with recognition of university training credits (CFU) on the basis of the didactic regulations of the individual universities. In this regard, reference should be made to the current legislation.

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 1040 hours of lessons and at least 50% of the 760 hours of internship in the company, and having obtained in all the Didactic modules at least 60/100, are admitted to 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

First year

UFC 1 - EMPOWERMENT AND TEAM BUILDING
1.1 Outdoor Training (in outdoor environment)
1.2 Self Empowerment and Team Building Workshop
1.3 Problem setting and solving - decision making - time management

UFC 2 - JOB AND BUSINESS ORIENTATION
2.1 The company and the employment relationship (contracts)
2.2 Business organization and organization charts
2.3 Safety and prevention of workplace accidents (high risk)

UFC 3 - LANGUAGE SKILLS
3.1 English theory
3.2 English workshop
3.3 Technical English

UFC 4 - MECHANICAL DESIGN
4.1 Bases of mechanical design
4.2 Machine design and Automatic machines
4.3 Material technology and Metallurgy

4.4 Product Lifecycle Management (PLM) Life Cycle Assessment (LCA)
4.5 Regulations for mechanical technical drawing
4.6 Laboratory of basic mechanical measurements
4.7 Basic mechanical laboratory (manual machines)

UFC 5 - MECHANICAL DESIGN TOOLS
5.1 Computer Aided Design (Autocad)
5.2 Basic Parametric Solid Modeling (Solidworks)
5.3 Laser scanning and reverse engineering

UFC 7 - PRODUCT INDUSTRIALISATION
7.1 Production technologies and machining
7.2 New machinery directive (2006/42/EC)
7.3 Design for production
7.4 Documentation and technical manuals
7.5 PFC Techniques Manufacturing and Control Plans
7.6 Implantation techniques on complex machines and systems

UFC 8 - SYSTEM OPERATION AND MAINTENANCE
8.1 Management of installation and maintenance services
8.2 Techniques for predicting failure modes
8.3 Installation and maintenance of mechanical, pneumatic and electrical equipment

UFC 9 - INDUSTRIAL PROCESS AND SUPPLY CHAIN MANAGEMENT FROM A GREEN VIEW
9.1 Quality policies in the use of processes (ISO 9001)
9.2 Lean Manufacturing (Six Sigma)

Second year

UFC 6 - PRODUCT PROTOTYPING AND DEVELOPMENT
6.1 Advanced welding techniques and process
6.2 Robot application techniques to production processes
6.3 Technical and application cards for industrial automation
6.4 3D Modelling and Additive manufactoring (CAD)
6.5 Additive manufacturing e Topological optimization of structures
6.6 CAM (SolidCam Esprit) and ISO programming
6.7 Static and dynamic structural analysis with FEM methodology
6.8 Advanced mechanical measurement laboratory (TAC, CMM, Optical Scanning, etc.)
6.9 Advanced mechanics laboratory (numerical control machines)

UFC 9 - INDUSTRIAL PROCESS AND SUPPLY CHAIN MANAGEMENT FROM A GREEN VIEW

9.3 Production processes and costs of corporate structures
9.4 Order management techniques
9.5 Data Management for 4.0 processes
9.6 Supply Chain Management
9.7 Ecological enterprise; iso 14000 and environmental compatibility of industrial production

UFC 10 - STAGE
10.1 Internship in the company

Diagram of the structure of the course with the relative credits

Acronym	InnoMec22					
Title	Course for Higher Technician for the planning and the advanced mechanical workings					
Module Code	Topics	Hours UFC	Hours First year Modules	Hours Second year Modules	Credits First year	Credits Second year
	UFC 1 - EMPOWERMENT E TEAM BUILDING	40	First year	Second year	First year	Second year
1.1	Outdoor Training (in ambiente esterno)		8		2	
1.2	Laboratorio di Self Empowerment e Team Building		16			
1.3	Problemsetting and solving - decision making - time management		16			
	UFC 2 - JOB AND BUSINESS ORIENTATION	36	First year			
2.1	The company and the employment relationship (contracts)		8		4	
2.2	Business organization and organization charts		12			
2.3	Safety and prevention of workplace accidents (high risk)		16			
	UFC 3 - LANGUAGE SKILLS	68	First year			
3.1	English theory		40		3	
3.2	English workshop		20		2	
3.3	Technical English		8			
	UFC 4 - MECHANICAL DESIGN	184	First year			
4.1	Bases of mechanical design		20		4	
4.2	Machine design and Automatic machines		20		4	
4.3	Material technology and Metallurgy		40		4	
4.4	Product Lifecycle Management (PLM) Life Cycle Assessment (LCA)		20		2	
4.5	Regulations for mechanical technical drawing		20		2	
4.6	Laboratory of basic mechanical measurements		32		2	
4.7	Basic mechanical laboratory (manual machines)		32		2	
	UFC 5 - MECHANICAL DESIGN TOOLS	152	First year			
5.1	Computer Aided Design (Autocad)		40		2	
5.2	Basic Parametric Solid Modeling (Solidworks)		80		4	
5.3	Laser scanning and reverse engineering		32		2	
	UFC 6 - PRODUCT PROTOTYPING AND DEVELOPMENT	244		Second year		
6.1	Advanced welding techniques and process			32		2
6.2	Robot application techniques to production processes			24		3
6.3	Technical and application cards for industrial automation			24		2
6.4	3D Modelling and Additive manufactoring (CAD)			40		3
6.5	Additive manufacturing e Topological optimization of structures			20		3
6.6	CAM (SolidCam Esprit) and ISO programming			32		4
6.7	Static and dynamic structural analysis with FEM methodology			20		2
6.8	Advanced mechanical measurement laboratory (TAC, CMM, Optical Scanning, etc.)			20		1
6.9	Advanced mechanics laboratory (numerical control machines)			32		2
	UFC 7 - PRODUCT INDUSTRIALISATION	112	First year			
7.1	Production technologies and machining		20		3	
7.2	New machinery directive (2006/42/EC)		12		1	
7.3	Design for production		20		1	
7.4	Documentation and technical manuals		20		2	
7.5	PFC Techniques Manufacturing and Control Plans		20		2	
7.6	Implantation techniques on complex machines and systems		20		2	
	UFC 8 - SYSTEM OPERATION AND MAINTENANCE	44	First year			
8.1	Management of installation and maintenance services		12		2	
8.2	Techniques for predicting failure modes		8		1	
8.3	Installation and maintenance of mechanical, pneumatic and electrical equipment		24		3	
	UFC 9 - INDUSTRIAL PROCESS AND SUPPLY CHAIN MANAGEMENT FROM A GREEN VIEW	160	First year	Second year		
9.1	Quality policies in the use of processes (ISO 9001)		32		2	
9.2	Lean Manufacturing (Six Sigma)		32		2	
9.3	Production processes and costs of corporate structures			24		1
9.4	Order management techniques			24		1
9.5	Data Management for 4.0 processes			24		1
9.6	Supply Chain Management			12		1
9.7	Ecological enterprise; iso 14000 and environmental compatibility of industrial production			12		
	UFC 10 - STAGE	760		Second year		
10.1	Internship in the company			760		34
	TOTAL HOURS	1800	700	1100	60	60

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.

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 (1040 hours),
internship, in Italy and abroad (760 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.

Language of lessons

Italian

Course calendar

Start-up	**September**	**2022**
Preliminary Lessons on fundamental topics to the understanding of the course	**October**	**2022**
End of first year	**June**	**2023**
Second-year start	**September**	**2023**
Start of internship in Italy	**February**	**2024**
Start of foreign internship (if any)	**May**	**2024**
End of the course	**September**	**2024**
Final examination	**October**	**2024**

Information on the organisation of mentoring and accompanying 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
Initials			
Presentation and training agreement		2	2
Individual analysis	2		50
Preliminary Lessons on fundamental topics to the under-standing of the course		32	32
Additional training			
English conversation	4		100
Laboratory of production synthesis		48	48
Stage alignment			
Collective orientation internship		4	4
Individual orientation internship	1		25
Accompaniment			
Collective accompaniment		20	20
Individual accompaniment	1		25
Totale	**8**	**106**	**306**

Calculation based on the number of students = 25