



REPORT

September 2015

Project: Design of Curriculum for Woodworking CNC Operators in Turkey
ERASMUS+ KEY ACTION 2 – STRATEGIC PARTNERSHIP PROJECTS
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**DESIGN OF CURRICULUM
FOR WOODWORKING
CNC OPERATORS IN
TURKEY
(PRO-CNC)**

C.1. Short term joint staff training events
Short term CNC operation on the job training in Italy

(Hosting organisation: Aris - Participating organisation: IKOR and ODTÜ)

Report

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With contributions from:		



1. Italian vocational education system

The Italian vocational education system is based on 4 levels of VET

- VET in formal secondary education system (public and private recognised secondary schools institutes *IPSIA - Istituto Professionale Settore Industria e Artigianato*, and *IPSS - Istituto Professionale Settore Servizi*; institutes *ITST - Istituto Tecnico Settore Tecnologico*, and *ITSE - Istituto Tecnico Settore Economico*), for initial VET at EQF level 3 and 4;
- VET in professional training centres accredited by the public authority competent in VET (*Agenzie Formative accreditate*), for initial and continuing VET at EQF levels 2, 3, 4 and 5;
- post-secondary non-academic vocational education (institutes *IFTS - Istruzione e Formazione Tecnica Superiore* and *ITS - Istituti Tecnici Superiori*), for initial VET at EQF level 5
- Vocational education at academic level, for VET at EQF level 6 and higher.

The Italian VET system is one of the most decentralised vocational education systems in the European Union, accordingly to exclusive competence in professional qualification matter attributed to the Regions by the Italian Constitution (art. 117). In effect, in Italy there are 20 regional qualification frameworks, one for every Italian region (more exactly 21, since the two Autonomous Provinces of Bolzano / Bozen and Trento have constitutional regional relevance), being each Region competent to establish the qualification, training and certification standards to be applied in the own regional territory. Recently, the national Legislative Decree 13 / 2013 has created the National Qualification Framework gathering all the qualification standards already included in the Italian officially recognised sectoral and territorial qualification frameworks (namely, the regional ones), also establishing common national essential standards for regional qualification, training and certification standards.

2. The Regional Qualification Framework of the Italian region Umbria

The Umbria region, in which is located and operates the Italian partner Aris Formazione e Ricerca Società Cooperativa, has one of the most advanced Italian regional VET systems, with specific rules defining both the Umbrian regional system of professional, training and certification standards (DGR - Deliberation of the Government of the Region 51 / 2010), and the Umbrian regional system for recognition of training credits, also coming from informal and non formal learning (DGR 1429 / 2007, “Credits Directive”). In synthesis, in Umbria region, the professional, training and certification standards are formally established/updated by the Regional Government (art. 4 DGR 51/2010), after consultation (art. 7.2) with the social partners, the professional associations and the VET providers : the Regional offices (art 7.1) evaluate the informal proposals coming from the key actors, then the Regional Government formally decide about them (cfr., www.regione.umbria.it/lavoro-formazione/sistema-regionale-standard-professionali-formativi-di-certificazione-riconoscimento-dei-crediti).

3. VET for CNC in wood and furniture manufactures in Umbria and in Italy

The Umbrian qualification standards don't include any reference neither to woodworking sector, nor to CNC in wood and furniture manufactures.

This evidence is directly linked to the very differenced relative importance of the woodworking industry across the Italian regions: therefore, while in Umbria this economic sector is not particularly developed, wood and furniture manufactures are instead very important in other Italian regions, in particular in the following industrial districts (cfr. www.osservatoriodistretti.org/category/settore/arredo-casa):

- in the neighbour central Italian regions Marche (wood and furniture district of Pesaro-Fossombrone-Piandimeleto, specialised in kitchens), and Tuscany (wood and furniture district of Poggibonsi-Sinalunga)
- in the northern Italian regions Lombardy (furniture district of Brianza; wood district of Casalasco Viadanese), Veneto (artistic furniture district of Bassano; classical furniture district of Bassa Veronese; Venetian wood-furniture meta-district), Friuli-Venezia Giulia (district of the chair), and across these last two regions (furniture district of Livenza), as well as in Emilia-Romagna region (stuffed furniture district of Forlì)
- in the southern Italian across the regions Puglia and Basilicata (stuffed furniture district of Matera)

The most part of the learning opportunities for CNC education and training in woodworking industry within the Italian public sectoral vocational education system are then concentrated in these regions, with several courses for different diplomas and qualifications within VET in formal secondary education system (e.g.: IPSIA Galileo Galilei at Castelfranco Veneto, near the artistic furniture district of Bassano; IPSIA Giuseppe Meroni at Lissone, in Lombardy, within the furniture district of Brianza; IPSIA Antonio Mattioni at Cividale del Friuli, IPSIA Brugnera-Sacile, and ITST Arturo Malignani at Udine, in Friuli-Venezia Giulia, within/near the furniture and chair districts; IPSIA Francesco Buitoni at Sansepolcro, in Tuscany, near the wood and furniture district of Poggibonsi-Sinalunga; IPSIA Renzo Frau at San Ginesio, in the Marche, near the wood and furniture district of Pesaro-Fossombrone-Piandimeleto; etc.), VET in accredited professional training centres for regional official professional qualifications (e.g., in Emilia-Romagna, for the “Tecnologo delle produzioni arredamenti in legno”, in Lombardy for the “Falegname mobiliere”, in Tuscany for the “Tecnico della definizione tecnica del progetto e della realizzazione di prototipi e modelli”, etc), post-secondary non-academic vocational education (e.g.: Polo Formativo IFTS Industria del legno del mobile e dell'arredo at Udine, in Friuli-Venezia Giulia; IFTS “Tecnico Superiore per la realizzazione di prodotti made in Italy con ingegnerizzazione e marketing nel settore Legno-Arredo” at Lissone, in Lombardy; etc), and vocational education at academic level (e.g.: at the University of Florence “Laurea in Tecnologie del Legno”,

at the University of Padua “Laurea in Tecnologie e Industrie del Legno“, at the University of Como “Diploma in Ingegneria Logistica orientamento legno-mobile“, at the Tuscia University “Laurea in Tecniche Forestali e Tecnologie del Legno“).

4. The VET services provided by Aris and the experience in CNC segment

ARIS is a Regional VET Provider a Research and Consultancy agency, operating at regional, national and European level through its VET and Enterprise Network. ARIS managed as lead partner 3 LdV ToI - Leonardo da Vinci Transfer and innovation project, and as partner participated in other 5 LdV ToI. ARIS Italian Network allows to organize activities along the entire country. Where Perugia and Umbria Region are? Right in the MIDDLE of Italy, UMBRIA is the 'green heart' of Italy.

ARIS main tasks in its PRO CNC project :

Q1. Current Situation Analysis of the Furniture Industry and CNC Operations Literature Survey of CNC operations in the European Union (ODTU leading organization - Aris is participating organization)

Q2. Meta-Analysis of Education of CNC Operators in Turkey and the European Union

Survey Study on CNC education in woodworking industry in EU A literature survey is to be conducted on CNC education in schools and on-the-job training in EU. (ARIS will conduct the literature survey) METU and EBG will contribute providing information on-the-job training.

Q3. Short-Term Trainings Evaluation Report The assessment report will be based on the experience on short-term trainings in Italy and Germany. (ARIS and EBG will act as the facilitators) for getting this on the job training in Germany and in Italy. They will provide the typical curricula for CNC education in the respective countries. METU will write the report

Q4. Policy recommendations/guidelines - (ARIS will provide feedbacks)

Q5. Tailored Curriculum for CNC Operators in Turkey – (ARIS will provide feedbacks)

Q6. Preparations for the Short Term Trainings – (Materials for the training events C1 in Italy and C2 in Germany will be prepared by ARIS and EBG respectively)

E1. Dissemination of the Curriculum for CNC Operators in Turkey – (ARIS will attend)

E2. Conference: Improving Productivity in the Furniture Industry in Turkey (ARIS will attend)

C1. SHORT-TERM JOINT STAFF TRAINING EVENT - A short term CNC operation on the job training in Italy organized by ARIS. 8 participants from IKOOR and ODTU will go to Italy to attend this training. ARIS will prepare

the necessary training materials needed for the training event C1. METU will provide the general framework of the requirements for the training.

C2. SHORT-TERM JOINT STAFF TRAINING EVENT - (NO is in Germany)

5. Short term training in Italy

31 August – 04 September 2015

DAY 1 - Monday 31/08/2015 (09:00 – 17:00)

Meeting for Training at CFP – Centro di Formazione Professionale di Terni

Speakers: Mr. Fabio Narciso and Mr. Massimo Mansueti

Lunch - Free afternoon c/o Cascata delle Marmore

DAY 2 Tuesday 01/09/2015 (09:00 – 17:00)

Meeting for Training at CFP – Centro di Formazione Professionale di Terni

In the afternoon there will be the visit to the laboratories of the CFP Narni at the fortress of Narni.

DAY 3 Wednesday 02/09/2015 (09:00 – 17:00)

Visit at the Company FALEGNAMERIA CARDARELLI s.r.l.

Visit at the Company PAOLINI s.n.c.

DAY 4 Thursday 03/09/2015 (09:00 – 17:00)

Visit at the Company PAOLINI S.p.A.

DAY 5 - Friday 04/09/2015 (09:00 – 14:00)

Visit at the Company MARGARITELLI S.p.A. LISTONE GIORDANO

Programm of short term training in Italy (31 August – 04 September 2015)

5.1 Contents and program

DAY 1 - Monday 31/08/2015 (09:00 – 17:00)

Meeting for Training at CFP – Centro di Formazione Professionale di Terni

Location: Strada di Pentima, nr. 4 - 05100 Terni (TR) – Conctat number: (+39) 0744 432236 – Website: www.cfpterni.it

During the morning our speakers will present the training policies and new program guidelines in the Umbria and it includes a visit to the training center.

Training System: training concepts, didactic and technical structure of the training.

Speakers: Mr. Fabio Narciso and Mr. Massimo Mansueti

Lunch

Free afternoon c/o Cascata delle Marmore

DAY 2 Tuesday 01/09/2015 (09:00 – 17:00)

Meeting for Training at CFP – Centro di Formazione Professionale di Terni

Location: Strada di Pentima, nr. 4 - 05100 Terni (TR) – Conctat number: (+39) 0744 432236 – Website: www.cfpterni.it

In the afternoon there will be the visit to the laboratories of the CFP Narni at the fortress of Narni.

The CFP of Narni is an accredited facility, able to design, manage and implement any type of training program.

It conducts Center Educational Services, providing subject to local partners, equipment, personnel, capacity design, construction, administration and accounting aimed at the implementation of the measures required. Everything aiming to raise the quality of the offer, the terms of both effectiveness and efficiency of operations linked to the same organization, in view of the quality system.

In the CFP will be carried out in cabinetmaking, woodworking and restoration wooden furniture.

DAY 3 Wednesday 02/09/2015 (09:00 – 17:00)

- Visit at the Company **FALEGNAMERIA CARDARELLI s.r.l.**

Location: Via del Lavoro, nr. 30/32 - 06044 Castel Ritaldi (PG) – Conctat number: (+39) 0743 51 845 – Website: www.cardarellinc.com

The Falegnameria Cardarelli srl was founded as a carpenter specializing in manufacturing and processing of wood, objects, furniture, fixtures. Over time, while remaining faithful to their origins, they have pioneered new technologies, trying to adapt the plants to the possibilities and requirements of the market.

Producers and artisans have moved to be suppliers of both regional and national business realities thanks to the innovations that have made a systematic activity. They were one of the first companies to use, in this sector, the technology of CNC machining centers, investing in new equipment and staff training.

- Visit at the Company **PAOLINI s.n.c.**

Location: S.S. Flaminia km 131-132 (PG) - 06049 Spoleto (PG) – Conctat number: (+39) 0743 277071 – Website: www.legnamipaolini.com

The PAOLINI Legnami, over more than 100 years, has developed as part of the trading and processing of high quality timber up to acquire expertise in the production of wooden roofs.

The Company has large warehouses where they are stored beams in chestnut, oak, larch and where we manufacture wood trusses on the project.

A separate section and 'dedicated to the laminated beams, available in different lengths with the option' cutting with special machine.

It offers a wide range of services ranging from the study of custom designs, to installation and construction phases entirely performed by skilled workers.

DAY 4 Thursday 03/09/2015 (09:00 – 17:00)

- Visit at the Company **PAOLINI S.p.A.**

Location: Via Flaminia Ternana, nr. 292 - 05035 Narni (TR) – Conctat number: (+39) 0744 761522 – Website: www.paolinispa.it

Paolini S.p.A. creates works of cabinet-making. In Narni, in Umbria, the plant is located. Paolini, 13,000 square meters covered and 21,000 are equipped work surfaces, where advanced technologies for the design, construction and logistics, alongside the ancient craft traditions.

Even today, the production is entrusted to the hands of master craftsmen, that give shape and value to each artifact, which remains unique for its history, for its materialie for the charm that it is able to convey to the user. The attention to detail in the smallest detail is the hallmark of Paolini.

The Paolini S.p.A. controls other Italian companies, each with a strong specialization in the production chain of the high cabinet. The total workforce is 115 units.

Lunch

DAY 5 - Friday 04/09/2015 (09:00 – 14:00)

- Visit at the Company **MARGARITELLI S.p.A.**

Location: Miralduolo di Torgiano, 06089 Torgiano (PG) – Contact number: (+39) 075 88681 Web www.margaritelli.com

The entire production cycle of the division Home wood Margaritelli takes place at plants in Miralduolo, Fontaines and Ardentes. The establishment provides Fontaines, Burgundy, specialized center in the first processing of European wood-producing Listone Giordano (the oak in particular), is realized in 1961, when Margaritelli turns to France, the main European forest basin, to ensure a steady supply of raw material.

The production center Miralduolo (Perugia), founded in 1970, to carry out the final processing of Listone Giordano (assembly, finishing, selection, through to storage, in a brand new automated warehouse, which now manages the entire production). In 1999, through the acquisition of "Parquetterie Berrichonne" - historic French company of wood flooring - Margaritelli, further consolidates its leading role in the international markets.

5.2 Tool for the training assessment

General Subjects for all Professional Profiles

Subjects	First Year	Second Year	Third Year
	(hours)	(hours)	(hours)
Italian Language	145	50	35
English Language	60	25	20
Logical -Mathematical Thinking	120	35	25

Scientific Thought	60	15	10
Informatics	65	25	20
History, Geography, Society	60	20	10
Civic Culture	25	20	5
Economic system and Employment Law	25	10	5
Work World	20	12	12
Personal skills	20	12	12
Duration	600	224	154

Courses for CNC Operators

	ARTICOLATIONS IN THREE YEARS		
	FIRST	SECOND	THIRD
Gainful employment in the form of employee or self-employed	20	12	12
The professional activity of officer qualified to machine tools	24	12	12
Measurements and tolerances	28	36	36
Interpretation of technical drawings and Specific production		76	84
Machining with conventional machines and		100	122

cnc			
Preparation of the machines for the working		56	76
Machining of adjustment		76	96
Group , position , role , climate organizational		24	24
Care and maintenance of the station job		36	36
Safety in the workplace	28	32	32
Assessing the quality of a process and production of their work		16	16
	100	476	546

Competence Unit Make machining machines with conventional and / or CNC

Minimum skills

- Make preliminary operations to machining Position in a timely manner the blank on the fixing system

Start the machine tool, in order to acquire the shares in the car of the blank Evaluate if the blank has been positioned in the car properly

Re-position the workpiece in the machine, in case of failure of the measurement, until you find the correct positioning

- Make machining deformation / metal cutting / cutting

Start the machine tool (conventional and / or cnc) in order to execute the machining program in Realize the operating sequences which make up the production process in question, controlling in the pipeline that the machine and the equipments are working properly appended. Assess the quality of the work performed. Direct the work piece to the appropriate destination. Start a new processing cycle proceeding with the placement of a new blank.

Competence Unit Prepare the equipment for processing and managing the reference documentation – machining

- Take charge of the resources necessary for the production of the product, and verify compliance with the provisions incorporated and perform preliminary processing

Take charge of the machine tool assigned and check the status of operation, reporting any irregularities and anomalies to their superior

Acquire the tools required to achieve the desired processing and mount it to the boom (pre-setting)

Set the operating parameters of the machine tool (trajectory to follow, speed, pressure, force, etc.), or, in the case of CNC machines, load the program machining program developed by staff, in order that the product manufactured desired Check machine tool operation (setting)

- Manage the reference documentation

Explicit on the processing schedule all the information needed to describe the process of machining of the workpiece. Record on the "diary" of the machine tool all the information useful in defining the history of the machine tool. Record on the "boards control compliance" measurements taken at the end of processing in order to highlight the compliance or non-specified tolerances in the drawings.

Working with traditional machines and CNC

- Make preliminary operations to machining Position in a timely manner the blank on the fixing system

Start the machine tool, in order to acquire the shares in the car of the blank Evaluate if the blank has been positioned in the car properly

Re-position the workpiece in the machine, in case of failure of the measurement, until you find the correct positioning

- Make machining deformation / metal cutting / cutting

Start the machine tool (conventional and / or cnc) in order to execute the machining program in Realize the operating sequences which make up the production process in question, controlling in the pipeline that the machine and the equipments are working properly appended.

Assess the quality of the work performed. Direct the work piece to the appropriate destination. Start a new processing cycle proceeding with the placement of a new blank.

Preparation of processing machines

- Take charge of the resources necessary for the production of the product, and verify compliance with the provisions incorporated and perform preliminary processing

Take charge of the machine tool assigned and check the status of operation, reporting any irregularities and anomalies to their superior

Acquire the tools required to achieve the desired processing and mount it to the boom (pre-setting)

Set the operating parameters of the machine tool (trajectory to follow, speed, pressure, force, etc.), or, in the case of CNC machines, load the program machining program developed by staff, in order that the product manufactured desired Check machine tool operation (setting)

- Manage the reference documentation

Explicit on the processing schedule all the information needed to describe the process of machining of the workpiece. Record on the "diary" of the machine tool all the information useful in defining the history of the machine tool. Record on the "boards control compliance" measurements taken at the end of processing in order to highlight the compliance or non-specified tolerances in the drawings.

5.3 Evaluation

Assessment of the contents of course or training content regarding the objectives and learning outcomes is one of the major requirements in order to evaluate the skills, knowledge and competency of students/learners no matter what the level is or which discipline the content is designed for. This serves to highlight the problems and difficulties of training and formulate solutions.

List of references:

Regione Umbria (www.regione.umbria.it)

Osservatorio Nazionale Distretti Italiani (www.osservatoriodistretti.org)

For further information on the project::

www.pro-cnc-sp.com

For further information on this paper :

enrico.libera@arisformazione.it

6. ANNEX



CERTIFICATE OF ATTENDANCE

It is hereby certified that

xxxxx|

has participated the short-term joint staff training of Erasmus+ KA2 PRO-CNC Project, to observe existing andragogical trainings with CNC operations as for the Project of "Design of Curriculum for Woodworking CNC Operators in Turkey" between 31 Aug-04 Sep 2015 in Terni (Italy)

Project Partner ARIS Formazione e Ricerca



This Project is granted by the European Commission under the Erasmus+ Programme (Lifelong Learning or Youth Programme), implemented by The Turkish Republic Ministry of European Union and the Center for European Union Education and Youth Programmes (Turkish National Agency/<http://www.ua.gov.tr>)